

# A set of mixed–element transition patterns for adaptive 3D meshing

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## Abstract

In this technical report, we introduce a set of mixed–element patterns that are meant to be used with the Octree. In difference with previous works, we programmed the whole set of patterns, considering all possible combinations when an Octant and its neighbors differ, at most, in one level of refinement. By doing this, we expect to have more control over the quantity of nodes in the final mesh, because other techniques that implement a subset of transition patterns, must refine the Octant whenever the pattern is not found in their list.

## 1 Introduction

The Octree technique [8, 7] is one of the most used techniques to concentrate nodes in a given region of a mesh. The basic idea is to split an Octant into several new Octants in a recursive way. The decision for splitting or not an Octant is made regarding some geometric constraint. The original idea was to split each Octant that intersected a portion of input domain’s boundary. Once the splitting process (which can be seen as a refinement process) is finished, the mesh is topologically inconsistent. This is due to the fact that not all Octants are refined to the same level.

There are two different approaches for achieving correct transitions between coarse and fine regions: using only hexahedra and using mixed–elements. In the first case, whenever an Octant must be refined, it is split into 27 new Octants (a grid of  $3 \times 3 \times 3$  new cubes). On the other hand, when using mixed–elements, each Octant is split into 8 new Octants when refinement is needed, which gives more control over the quantity of nodes in the final mesh.

Several techniques exists to perform the transitions using only hexahedra [5, 6, 10, 9, 3, 2]. On the other hand, some works using mixed–elements are the ones of Conti et al. [1], and more recently, the work of Nicolas and Fouquet in [4]. It is important to mention that all these techniques implement a set of patterns, for managing 1-irregular cases; meaning that an Octant differs at most, in one level of refinement with their neighbors. To be more specific, they all implement a subset of all possible 1-irregular patterns (no matter what type of elements they employ). Therefore, whenever a given configuration is not found in the set of patterns, they refine the Octant, which will increase the number of nodes in the mesh. Moreover, this unnecessary refinement may be extended throughout large regions until a pattern is found.

For this reason, in this technical report we show our whole set of transition patterns that consider all possible 1-irregular configurations. The goal to perform this important task, is to avoid the insertion of unnecessary nodes in the final mesh, due to non existence of a transition pattern for a given configuration.

## 2 Element and pattern conventions

The four basic element types considered in this work are shown in Figure 1. This convention will be used by all transition pattern to define their sub-elements. For instance if we define a prism (wedge) with the following indexes: 11 20 19 0 8 4, it means that one triangular face  $t$ , is defined by indexes: 11, 20 and 19. Moreover, nodes 0, 8 and 4 will have a positive distance w.r.t. to  $t$ , when its normal is computed counterclockwise.

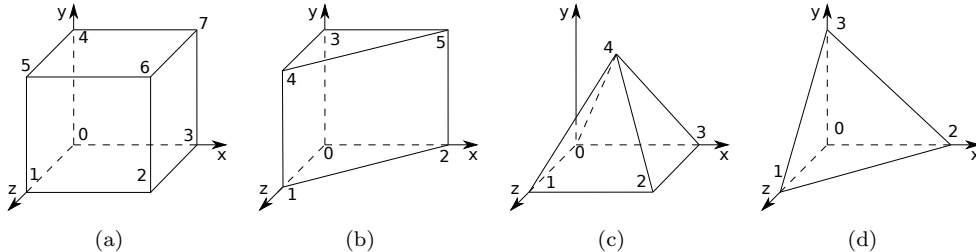


Figure 1: Basic elements: (a) hexahedron, (b) prism (wedge), (c) pyramid and (d) tetrahedron.

These patterns are meant to be applied when the mesh was generated by an Octree technique. Before managing transitions, all Octants are cubes, and they must be 1-irregular. Therefore, each edge may count with at most 1 node inserted in the middle of it, and same occurs with each face. All possible indexes in an Octant are shown in Figure 2.

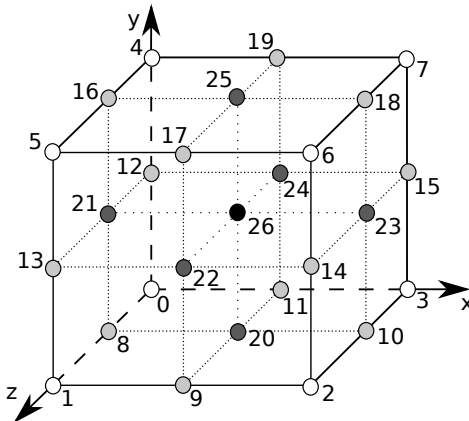


Figure 2: All possible nodes inserted in an hexahedron.

The only configurations allowed in the faces of a pattern, are the ones presented in figure 3. Following these “face patterns” we programmed a code capable of generating all possible combinations. Then we erased invalid configurations. Finally we reduced them to a total of 325 different patterns by using rotational operations. In other words, this set of 325 patterns, through rotational operations, considers all possible configurations of 1-irregular Octants.

As mentioned before, the goal of these patterns is to reduce the number of overall nodes in the final mesh. Unfortunately, for some configurations it was impossible to discretize the space with basic elements (shown in Figure 1) and, at the same time, comply with the constraints imposed by the patterns over the faces (shown in Figure 3). From a total of 325 patterns, 260 achieve correct subdivision, without inserting Octant’s central node. They are introduced in section 3. The other 65 patterns are introduced in section 4, at page 134. Note that all values of the Jacobian Ratio quality measure, have the value 1. This is due to no displacement is performed over the nodes. Therefore, they are all perfect elements in terms of this quality measure.

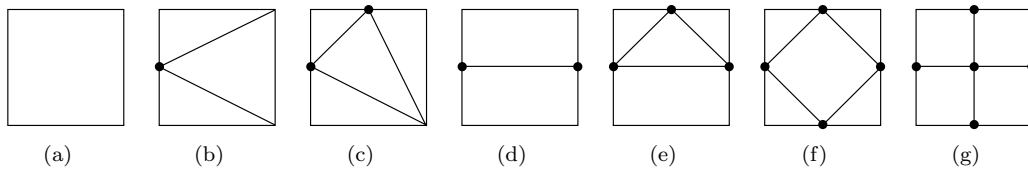


Figure 3: All possible cases for nodes inserted in edges or face central position.

The Aspect Ratio (AR) measure, on the other hand, give us more information on the actual quality of the patterns. Each pattern shows the average AR for its new sub-elements.

### 3 Patterns without cube's central node

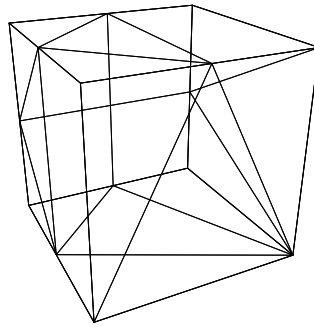
#### Pattern 1

**Node index:**

8 11 12 15 16 17 19 24

**List of Elements:**

Prism 6 7 15 17 19 24  
 Pyramid 0 11 24 12 8  
 Pyramid 3 15 24 11 2  
 Pyramid 4 12 24 19 16  
 Pyramid 6 17 24 15 2  
 Tetrahedra 16 19 17 24  
 Tetrahedra 8 12 16 24  
 Tetrahedra 8 2 11 24  
 Tetrahedra 24 17 8 2  
 Tetrahedra 16 17 8 24  
 Tetrahedra 1 2 8 17  
 Pyramid 1 8 16 5 17



Aspect Ratio:  
0.643957

Jacobian Ratio: 1

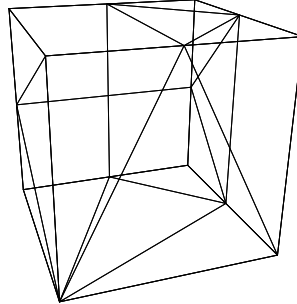
## Pattern 2

### Node index:

10 11 12 15 17 18 19 24

### List of Elements:

Pyramid 11 3 15 24 10  
Pyramid 7 19 24 15 18  
Tetrahedra 10 18 15 24  
Tetrahedra 10 18 24 17  
Pyramid 2 6 18 10 17  
Tetrahedra 17 19 18 24  
Pyramid 0 11 24 12 1  
Tetrahedra 1 10 11 24  
Tetrahedra 1 10 24 17  
Prism 4 5 12 19 17 24  
Pyramid 12 24 17 5 1  
Tetrahedra 1 2 10 17



Aspect Ratio:  
0.643957

Jacobian Ratio: 1

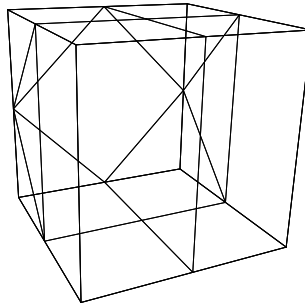
## Pattern 3

### Node index:

8 9 10 11 12 15 16 17 18 19 20 25

### List of Elements:

Pyramid 3 11 20 10 15  
Pyramid 0 8 20 11 12  
Pyramid 7 18 25 19 15  
Pyramid 4 19 25 16 12  
Pyramid 12 11 15 19 25  
Tetrahedra 11 25 20 15  
Tetrahedra 11 20 25 12  
Pyramid 10 20 25 18 15  
Pyramid 8 16 25 20 12  
Hexaedra 1 9 20 8 5 17 25 16  
Hexaedra 2 10 20 9 6 18 25 17



Aspect Ratio:  
0.668527

Jacobian Ratio: 1

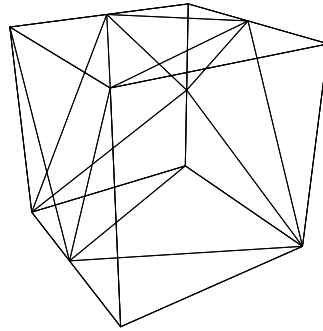
## Pattern 4

### Node index:

8 15 18 19

### List of Elements:

Tetrahedra 0 8 3 15  
Tetrahedra 7 15 18 19  
Tetrahedra 0 15 19 8  
Tetrahedra 0 19 4 8  
Tetrahedra 15 5 19 8  
Tetrahedra 4 19 5 8  
Tetrahedra 5 19 18 15  
Tetrahedra 2 3 8 15  
Tetrahedra 1 2 8 15  
Tetrahedra 2 18 15 1  
Tetrahedra 1 8 5 15  
Tetrahedra 15 18 5 1  
Pyramid 1 5 6 2 18



Aspect Ratio:  
0.530245

Jacobian Ratio: 1

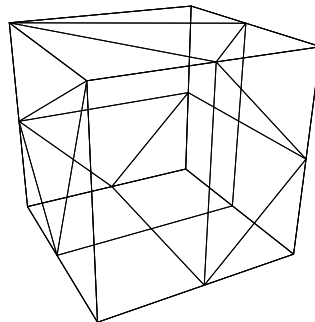
## Pattern 5

### Node index:

8 9 10 11 12 14 15 17 18 20 23

### List of Elements:

Prism 11 3 15 20 10 23  
Prism 20 10 23 9 2 14  
Pyramid 0 8 20 11 12  
Pyramid 11 20 23 15 12  
Prism 4 7 18 12 15 23  
Pyramid 23 18 4 12 17  
Pyramid 6 18 23 14 17  
Tetrahedra 4 17 5 12  
Tetrahedra 20 17 23 12  
Pyramid 9 14 23 20 17  
Pyramid 8 5 17 20 12  
Prism 1 8 5 9 20 17



Aspect Ratio:  
0.634707

Jacobian Ratio: 1

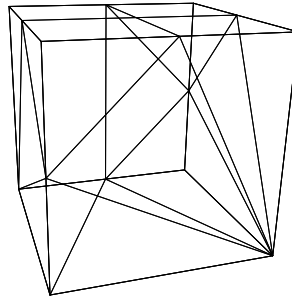
## Pattern 6

### Node index:

11 13 15 16 17 18 19 25

### List of Elements:

Pyramid 7 18 25 19 15  
Tetrahedra 3 15 11 2  
Tetrahedra 11 15 19 25  
Prism 0 4 16 11 19 25  
Tetrahedra 0 1 11 13  
Pyramid 0 11 25 16 13  
Tetrahedra 1 2 11 13  
Tetrahedra 2 18 15 25  
Tetrahedra 2 11 25 15  
Pyramid 6 17 25 18 2  
Tetrahedra 2 25 11 13  
Tetrahedra 2 25 13 17  
Pyramid 5 16 25 17 13



Aspect Ratio:  
0.622529

Jacobian Ratio: 1

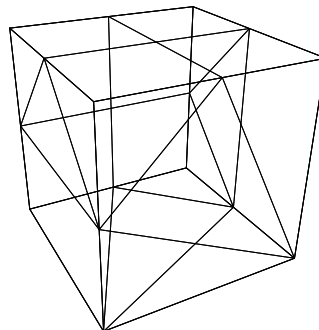
## Pattern 7

### Node index:

10 11 12 13 15 16 17 18 19 24 25

### List of Elements:

Prism 15 18 7 24 25 19  
Prism 4 16 12 19 25 24  
Prism 0 1 11 12 13 24  
Pyramid 3 15 24 11 10  
Pyramid 15 18 25 24 10  
Pyramid 1 11 24 13 10  
Tetrahedra 13 10 24 25  
Pyramid 12 24 25 16 13  
Prism 10 18 25 2 6 17  
Tetrahedra 1 2 10 13  
Pyramid 2 17 25 10 13  
Pyramid 5 16 25 17 13



Aspect Ratio:  
0.603082

Jacobian Ratio: 1

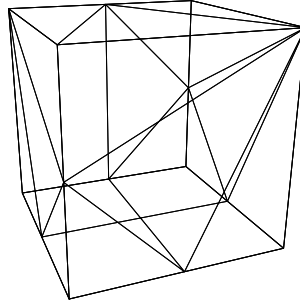
## Pattern 8

### Node index:

8 9 10 11 13 15 19 20

### List of Elements:

Prism 11 20 19 0 8 4  
Pyramid 3 11 20 10 15  
Tetrahedra 6 19 7 15  
Tetrahedra 11 19 20 15  
Tetrahedra 6 15 10 20  
Pyramid 2 10 20 9 6  
Tetrahedra 6 20 19 15  
Pyramid 4 8 20 19 13  
Tetrahedra 4 5 13 19  
Pyramid 1 9 20 8 13  
Tetrahedra 6 9 13 20  
Tetrahedra 6 13 19 20  
Tetrahedra 6 19 13 5



Aspect Ratio:  
0.621381

Jacobian Ratio: 1

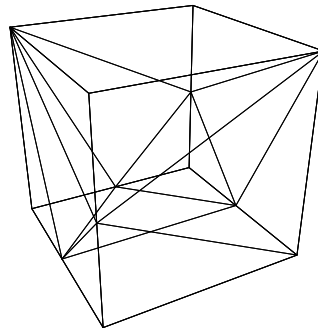
## Pattern 9

### Node index:

8 10 11 13 15

### List of Elements:

Tetrahedra 3 10 15 11  
Tetrahedra 0 8 11 4  
Pyramid 1 2 10 8 13  
Tetrahedra 8 10 11 13  
Tetrahedra 4 13 8 11  
Tetrahedra 10 15 11 13  
Tetrahedra 4 11 15 13  
Tetrahedra 4 15 7 13  
Tetrahedra 2 6 10 13  
Tetrahedra 10 6 15 13  
Tetrahedra 15 6 7 13  
Pyramid 4 7 6 5 13



Aspect Ratio:  
0.599592

Jacobian Ratio: 1

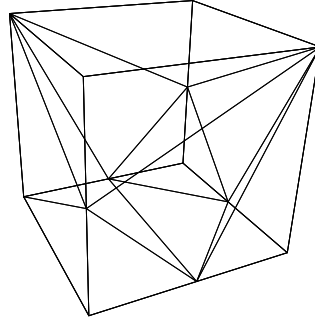
## Pattern 10

### Node index:

9 10 11 13 15

### List of Elements:

Pyramid 0 1 9 11 13  
Tetrahedra 0 11 4 13  
Tetrahedra 3 10 15 11  
Tetrahedra 2 10 9 6  
Tetrahedra 9 10 11 15  
Tetrahedra 6 15 10 9  
Tetrahedra 11 15 13 9  
Tetrahedra 11 13 15 4  
Tetrahedra 6 9 13 15  
Tetrahedra 6 13 5 15  
Tetrahedra 4 5 13 15  
Pyramid 4 7 6 5 15



Aspect Ratio:  
0.60588

Jacobian Ratio: 1

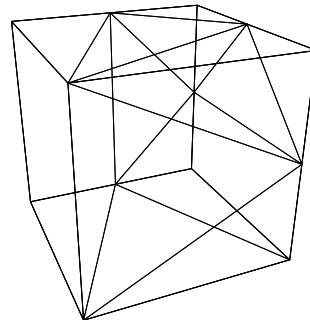
## Pattern 11

### Node index:

11 14 15 18 19

### List of Elements:

Prism 0 1 11 4 5 19  
Pyramid 2 14 15 3 11  
Tetrahedra 7 18 19 15  
Tetrahedra 14 18 15 19  
Tetrahedra 11 15 19 14  
Tetrahedra 1 2 11 14  
Pyramid 1 11 19 5 14  
Tetrahedra 5 19 18 14  
Tetrahedra 5 18 6 14



Aspect Ratio:  
0.633551

Jacobian Ratio: 1



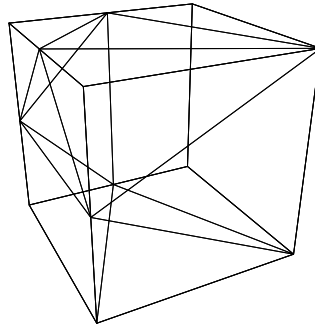
## Pattern 12

### Node index:

11 12 13 16 19

### List of Elements:

Pyramid 0 12 13 1 11  
Prism 2 3 11 6 7 19  
Tetrahedra 1 2 11 13  
Tetrahedra 4 12 19 16  
Tetrahedra 11 19 12 13  
Tetrahedra 12 16 13 19  
Pyramid 2 6 19 11 13  
Tetrahedra 6 16 19 13  
Tetrahedra 5 16 6 13



Aspect Ratio:  
0.633551

Jacobian Ratio: 1

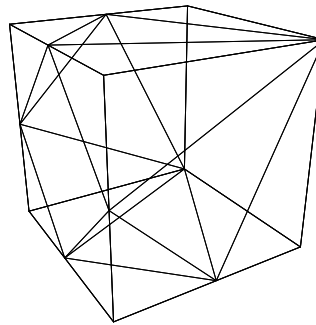
## Pattern 13

### Node index:

8 9 12 13 16 19

### List of Elements:

Tetrahedra 0 12 8 3  
Tetrahedra 3 19 12 8  
Tetrahedra 3 7 19 8  
Pyramid 2 6 7 3 9  
Tetrahedra 8 9 3 7  
Tetrahedra 4 12 19 16  
Tetrahedra 8 9 7 13  
Tetrahedra 8 19 13 7  
Tetrahedra 9 7 13 6  
Tetrahedra 1 13 9 8  
Pyramid 8 12 16 13 19  
Tetrahedra 6 19 7 13  
Tetrahedra 6 16 19 13  
Tetrahedra 5 16 6 13



Aspect Ratio:  
0.56748

Jacobian Ratio: 1

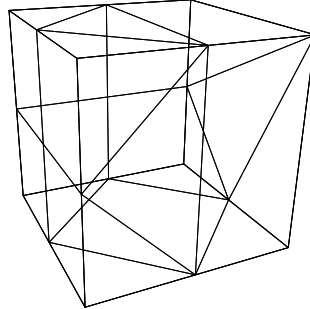
## Pattern 14

### Node index:

8 9 10 11 12 13 15 16 17 19 21 24

### List of Elements:

Prism 12 21 24 4 16 19  
Prism 0 8 11 12 21 24  
Prism 6 7 15 17 19 24  
Pyramid 3 15 24 11 10  
Prism 11 10 24 8 9 21  
Pyramid 1 8 21 13 9  
Pyramid 24 15 6 17 10  
Pyramid 21 9 10 24 17  
Tetrahedra 13 17 9 21  
Pyramid 2 9 17 6 10  
Pyramid 5 13 21 16 17  
Pyramid 16 21 24 19 17



Aspect Ratio:  
0.721171

Jacobian Ratio: 1

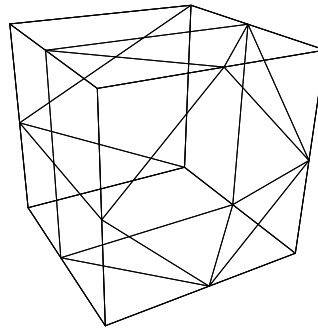
## Pattern 15

### Node index:

8 9 10 12 13 14 16 17 18 21

### List of Elements:

Prism 0 3 12 8 10 21  
Prism 10 21 18 3 12 7  
Prism 16 18 21 4 7 12  
Tetrahedra 10 14 18 21  
Tetrahedra 14 17 18 21  
Tetrahedra 16 18 17 21  
Tetrahedra 6 17 18 14  
Tetrahedra 2 9 14 10  
Tetrahedra 8 9 10 21  
Tetrahedra 9 14 10 21  
Pyramid 5 13 21 16 17  
Pyramid 1 8 21 13 9  
Pyramid 13 17 14 9 21



Aspect Ratio:  
0.697042

Jacobian Ratio: 1

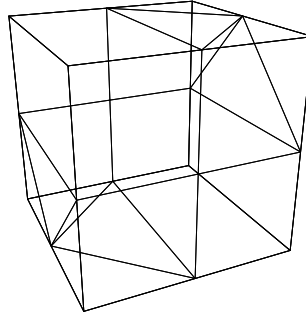
## Pattern 16

### Node index:

8 9 11 12 13 14 15 17 18 19 22 24

### List of Elements:

Hexaedra 3 15 24 11 2 14 22 9  
Pyramid 6 14 22 17 18  
Pyramid 17 22 24 19 18  
Pyramid 7 19 24 15 18  
Pyramid 14 15 24 22 18  
Pyramid 1 13 22 9 8  
Pyramid 9 22 24 11 8  
Pyramid 0 11 24 12 8  
Pyramid 13 12 24 22 8  
Hexaedra 5 17 22 13 4 19 24 12



Aspect Ratio:  
0.626599

Jacobian Ratio: 1

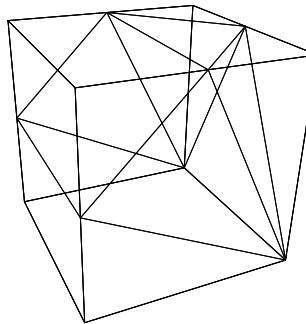
## Pattern 17

### Node index:

12 13 17 18 19

### List of Elements:

Tetrahedra 6 17 18 2  
Tetrahedra 7 18 19 3  
Pyramid 2 3 19 17 18  
Prism 3 19 12 2 17 13  
Prism 0 3 12 1 2 13  
Prism 4 12 19 5 13 17



Aspect Ratio:  
0.577624

Jacobian Ratio: 1

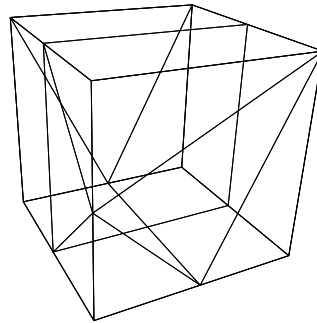
## Pattern 18

### Node index:

8 9 10 11 13 16 18 20

### List of Elements:

Prism 0 11 4 8 20 16  
Prism 4 11 7 16 20 18  
Prism 11 3 7 20 10 18  
Prism 20 10 18 9 2 6  
Tetrahedra 8 16 13 20  
Pyramid 1 9 20 8 13  
Tetrahedra 13 16 18 20  
Pyramid 9 6 18 20 13  
Pyramid 5 16 18 6 13



Aspect Ratio:  
0.547036

Jacobian Ratio: 1

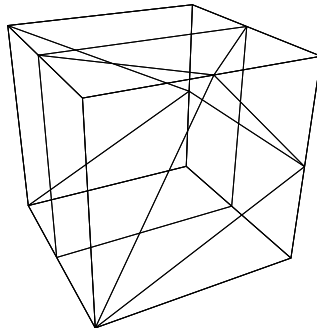
## Pattern 19

### Node index:

8 10 14 15 16 17 18 23

### List of Elements:

Prism 16 18 23 4 7 15  
Prism 0 15 4 8 23 16  
Prism 0 3 15 8 10 23  
Prism 8 10 23 1 2 14  
Tetrahedra 16 18 17 23  
Tetrahedra 8 16 17 23  
Pyramid 6 18 23 14 17  
Pyramid 1 8 16 5 17  
Pyramid 1 14 23 8 17



Aspect Ratio:  
0.552012

Jacobian Ratio: 1

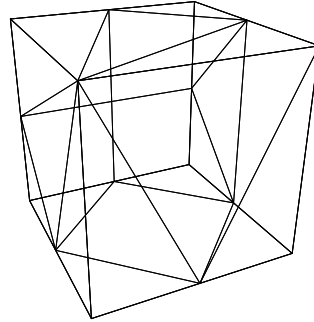
## Pattern 20

### Node index:

8 9 10 11 12 15 18 19 24

### List of Elements:

Pyramid 3 15 24 11 10  
Pyramid 0 11 24 12 8  
Pyramid 7 19 24 15 18  
Pyramid 4 12 24 19 5  
Pyramid 8 9 10 11 24  
Tetrahedra 8 12 5 24  
Tetrahedra 5 19 18 24  
Tetrahedra 10 18 15 24  
Tetrahedra 9 18 10 24  
Pyramid 2 6 18 10 9  
Tetrahedra 8 5 9 24  
Tetrahedra 5 18 9 24  
Tetrahedra 5 18 6 9  
Tetrahedra 1 9 8 5



Aspect Ratio:  
0.709654

Jacobian Ratio: 1

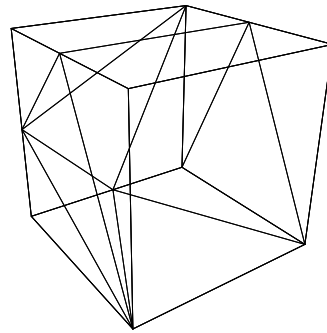
## Pattern 21

### Node index:

11 12 16 18

### List of Elements:

Tetrahedra 3 18 7 11  
Tetrahedra 2 18 3 11  
Tetrahedra 7 12 11 18  
Tetrahedra 0 11 12 1  
Pyramid 16 4 7 18 12  
Tetrahedra 12 18 16 11  
Tetrahedra 1 12 16 11  
Pyramid 1 16 18 2 11  
Prism 2 6 18 1 5 16



Aspect Ratio:  
0.544065

Jacobian Ratio: 1

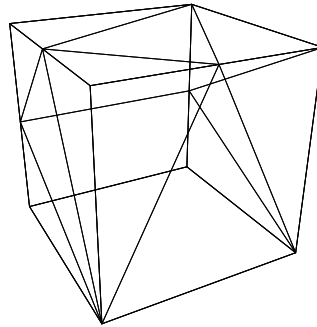
## Pattern 22

### Node index:

12 15 16 17

### List of Elements:

Prism 3 2 15 0 1 12  
Pyramid 12 15 7 4 16  
Tetrahedra 6 17 7 15  
Tetrahedra 7 17 16 15  
Tetrahedra 2 17 6 15  
Tetrahedra 12 16 17 15  
Pyramid 1 2 15 12 17  
Tetrahedra 1 12 16 17  
Tetrahedra 5 16 17 1



Aspect Ratio:  
0.544065

Jacobian Ratio: 1

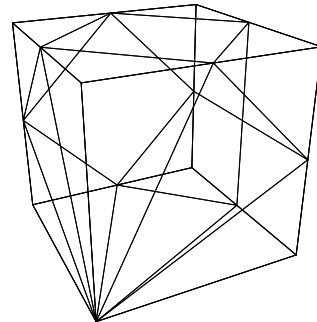
## Pattern 23

### Node index:

10 11 12 14 15 16 17 18 19 23

### List of Elements:

Pyramid 3 10 23 15 11  
Pyramid 2 14 23 10 1  
Tetrahedra 1 10 11 23  
Tetrahedra 0 11 12 1  
Tetrahedra 4 12 19 16  
Pyramid 15 23 18 7 19  
Pyramid 11 15 19 12 23  
Tetrahedra 12 19 16 23  
Pyramid 16 19 18 17 23  
Tetrahedra 1 11 12 23  
Tetrahedra 1 12 16 23  
Tetrahedra 1 16 17 23  
Tetrahedra 1 5 17 16  
Tetrahedra 1 17 14 23  
Pyramid 14 6 18 23 17



Aspect Ratio:  
0.743026

Jacobian Ratio: 1

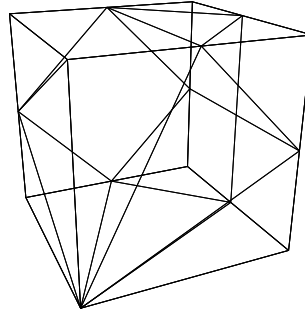
## Pattern 24

### Node index:

10 11 12 14 15 17 18 19 23

### List of Elements:

Pyramid 15 23 18 7 19  
Pyramid 6 18 23 14 17  
Tetrahedra 17 19 18 23  
Pyramid 3 10 23 15 11  
Pyramid 2 14 23 10 1  
Tetrahedra 1 10 11 23  
Pyramid 11 15 19 12 23  
Tetrahedra 12 19 17 23  
Tetrahedra 0 1 11 12  
Tetrahedra 1 11 12 23  
Tetrahedra 1 12 17 23  
Tetrahedra 1 17 14 23  
Tetrahedra 1 5 17 12  
Pyramid 4 19 17 5 12



Aspect Ratio:  
0.709654

Jacobian Ratio: 1

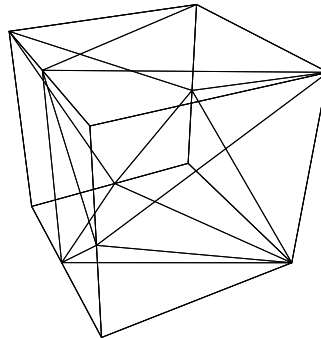
## Pattern 25

### Node index:

8 11 13 15 16

### List of Elements:

Tetrahedra 2 15 3 11  
Pyramid 0 4 16 8 11  
Tetrahedra 4 11 15 16  
Tetrahedra 4 7 16 15  
Tetrahedra 6 16 7 15  
Tetrahedra 11 2 15 16  
Tetrahedra 2 6 15 16  
Tetrahedra 2 11 8 16  
Tetrahedra 8 16 13 2  
Tetrahedra 1 8 13 2  
Tetrahedra 2 13 6 16  
Tetrahedra 5 6 13 16



Aspect Ratio:  
0.590326

Jacobian Ratio: 1

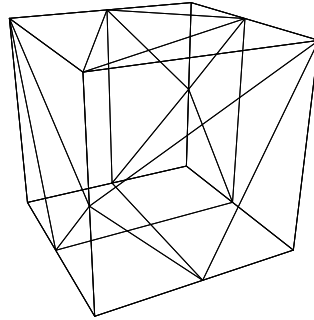
## Pattern 26

### Node index:

8 9 10 11 13 15 18 19 20

### List of Elements:

Pyramid 11 20 10 3 15  
Tetrahedra 18 19 7 15  
Tetrahedra 10 18 15 20  
Tetrahedra 11 15 19 20  
Tetrahedra 18 19 15 20  
Prism 11 20 19 0 8 4  
Prism 2 9 6 10 20 18  
Pyramid 4 8 20 19 13  
Pyramid 1 9 20 8 13  
Tetrahedra 13 19 18 20  
Pyramid 9 6 18 20 13  
Tetrahedra 5 4 19 13  
Tetrahedra 5 19 18 13  
Tetrahedra 5 18 6 13



Aspect Ratio:  
0.589138

Jacobian Ratio: 1

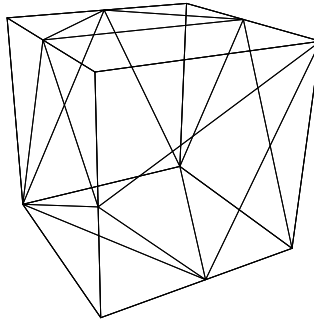
## Pattern 27

### Node index:

9 13 16 18 19

### List of Elements:

Tetrahedra 9 2 3 18  
Tetrahedra 2 6 18 9  
Tetrahedra 0 9 3 13  
Tetrahedra 0 1 9 13  
Tetrahedra 3 7 19 18  
Tetrahedra 0 4 16 19  
Pyramid 0 16 18 3 19  
Pyramid 0 3 18 16 13  
Tetrahedra 3 13 9 18  
Tetrahedra 13 6 9 18  
Pyramid 5 16 18 6 13



Aspect Ratio:  
0.547171

Jacobian Ratio: 1



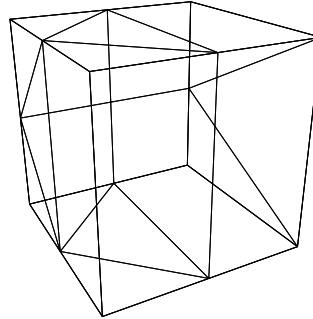
## Pattern 28

### Node index:

8 9 11 12 15 16 17 19 24

### List of Elements:

Prism 9 11 24 2 3 15  
Prism 9 24 17 2 15 6  
Prism 6 7 15 17 19 24  
Pyramid 4 12 24 19 16  
Tetrahedra 16 19 17 24  
Tetrahedra 8 12 16 24  
Pyramid 0 11 24 12 8  
Tetrahedra 8 9 11 24  
Pyramid 8 16 17 9 24  
Prism 1 9 8 5 17 16



Aspect Ratio:  
0.618749

Jacobian Ratio: 1

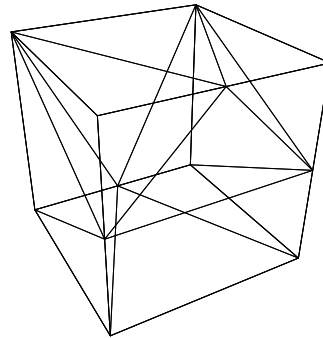
## Pattern 29

### Node index:

11 13 14 17

### List of Elements:

Tetrahedra 0 1 11 13  
Tetrahedra 2 3 11 14  
Pyramid 1 13 14 2 11  
Tetrahedra 3 14 7 11  
Tetrahedra 0 11 4 13  
Pyramid 4 7 14 13 11  
Pyramid 4 13 14 7 17  
Tetrahedra 4 17 5 13  
Tetrahedra 6 17 7 14



Aspect Ratio:  
0.548601

Jacobian Ratio: 1

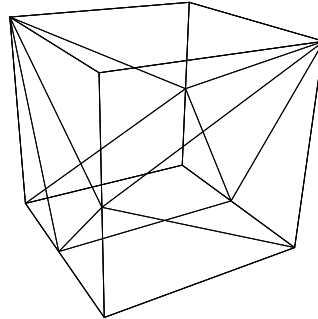
## Pattern 30

### Node index:

8 10 13 15

### List of Elements:

Pyramid 0 8 10 3 15  
Tetrahedra 8 10 15 13  
Tetrahedra 0 4 8 15  
Tetrahedra 8 4 13 15  
Tetrahedra 4 15 7 13  
Pyramid 1 2 10 8 13  
Tetrahedra 6 7 15 13  
Tetrahedra 6 15 10 13  
Tetrahedra 2 6 10 13  
Pyramid 4 7 6 5 13



Aspect Ratio:  
0.604172

Jacobian Ratio: 1

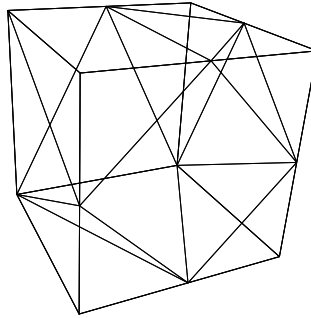
## Pattern 31

### Node index:

9 13 14 17 18 19

### List of Elements:

Tetrahedra 2 14 3 9  
Tetrahedra 3 18 7 19  
Tetrahedra 0 9 3 19  
Tetrahedra 3 14 18 19  
Tetrahedra 9 14 3 19  
Tetrahedra 17 19 18 14  
Tetrahedra 17 18 6 14  
Tetrahedra 0 1 9 13  
Tetrahedra 0 9 19 13  
Tetrahedra 0 19 4 13  
Pyramid 5 4 19 17 13  
Pyramid 13 17 14 9 19



Aspect Ratio:  
0.630342

Jacobian Ratio: 1

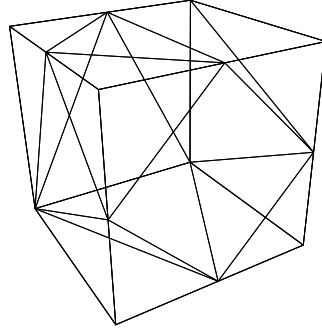
## Pattern 32

### Node index:

9 13 14 16 17 19

### List of Elements:

Tetrahedra 2 14 3 9  
Tetrahedra 3 14 7 19  
Pyramid 6 17 19 7 14  
Tetrahedra 0 9 3 19  
Tetrahedra 3 9 14 19  
Tetrahedra 0 1 9 13  
Tetrahedra 0 13 9 19  
Tetrahedra 0 4 16 19  
Tetrahedra 0 16 13 19  
Tetrahedra 16 19 17 13  
Tetrahedra 5 16 17 13  
Pyramid 9 13 17 14 19



Aspect Ratio:  
0.630342

Jacobian Ratio: 1

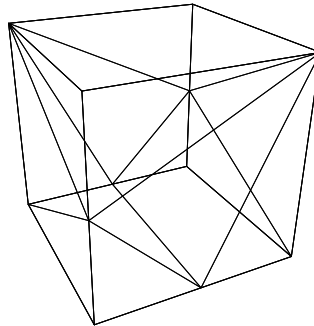
## Pattern 33

### Node index:

9 11 13 15

### List of Elements:

Pyramid 2 3 11 9 15  
Pyramid 0 1 9 11 13  
Tetrahedra 13 15 9 11  
Tetrahedra 0 4 13 11  
Tetrahedra 4 11 15 13  
Tetrahedra 9 2 15 6  
Tetrahedra 13 6 9 15  
Tetrahedra 4 5 13 15  
Tetrahedra 5 6 13 15  
Pyramid 4 7 6 5 15



Aspect Ratio:  
0.604172

Jacobian Ratio: 1

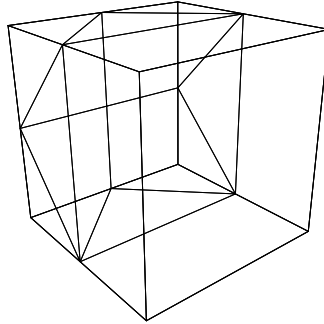
## Pattern 34

### Node index:

8 10 11 12 15 16 18 19 24

### List of Elements:

Pyramid 0 11 24 12 8  
Pyramid 3 15 24 11 10  
Pyramid 4 12 24 19 16  
Pyramid 24 15 7 19 18  
Tetrahedra 16 19 18 24  
Tetrahedra 10 18 15 24  
Tetrahedra 8 10 11 24  
Tetrahedra 8 12 16 24  
Pyramid 8 16 18 10 24  
Hexaedra 8 10 18 16 1 2 6 5



Aspect Ratio:  
0.712592

Jacobian Ratio: 1

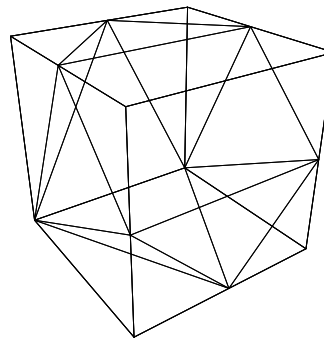
## Pattern 35

### Node index:

9 13 14 16 18 19

### List of Elements:

Tetrahedra 0 19 4 16  
Tetrahedra 3 7 19 18  
Pyramid 0 16 18 3 19  
Tetrahedra 0 1 9 13  
Tetrahedra 2 3 9 14  
Pyramid 0 3 14 13 9  
Prism 3 14 18 0 13 16  
Prism 5 13 16 6 14 18



Aspect Ratio:  
0.543306

Jacobian Ratio: 1

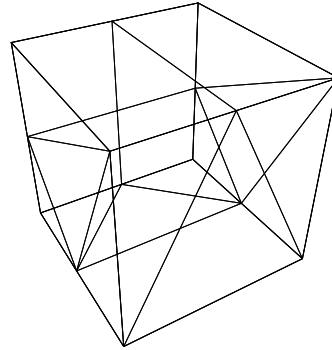
## Pattern 36

### Node index:

8 10 11 12 15 17 19 24

### List of Elements:

Prism 4 5 12 19 17 24  
Prism 19 17 24 7 6 15  
Pyramid 0 11 24 12 8  
Pyramid 11 3 15 24 10  
Tetrahedra 8 10 11 24  
Pyramid 6 17 24 15 10  
Pyramid 5 12 24 17 8  
Tetrahedra 8 17 10 24  
Tetrahedra 2 17 6 10  
Tetrahedra 1 5 17 8  
Pyramid 1 2 10 8 17



Aspect Ratio:  
0.583703

Jacobian Ratio: 1

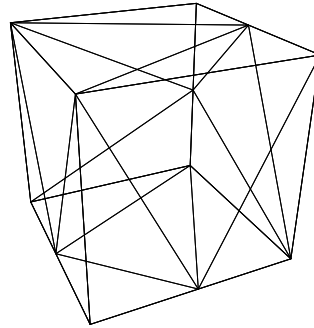
## Pattern 37

### Node index:

8 9 15 18

### List of Elements:

Tetrahedra 0 8 3 15  
Tetrahedra 3 8 9 15  
Tetrahedra 2 3 9 15  
Tetrahedra 0 4 8 15  
Tetrahedra 2 18 15 9  
Tetrahedra 2 9 6 18  
Tetrahedra 8 18 9 15  
Tetrahedra 4 7 18 15  
Tetrahedra 4 15 18 8  
Tetrahedra 4 5 8 18  
Tetrahedra 8 5 9 18  
Tetrahedra 5 18 6 9  
Tetrahedra 1 9 8 5



Aspect Ratio:  
0.57022

Jacobian Ratio: 1

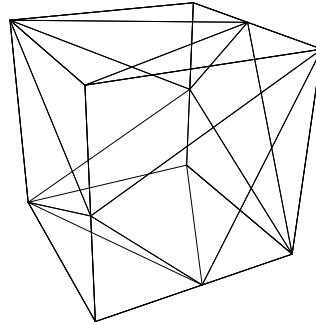
## Pattern 38

### Node index:

9 13 15 18

### List of Elements:

Tetrahedra 2 3 9 15  
Tetrahedra 0 9 3 15  
Tetrahedra 2 18 15 9  
Tetrahedra 2 6 18 9  
Tetrahedra 4 7 18 15  
Tetrahedra 9 3 0 15  
Tetrahedra 0 1 9 13  
Tetrahedra 0 15 4 13  
Tetrahedra 13 15 4 18  
Tetrahedra 13 18 9 15  
Tetrahedra 4 18 5 13  
Tetrahedra 5 18 6 13  
Tetrahedra 9 13 6 18  
Tetrahedra 13 15 9 0



Aspect Ratio:  
0.574248

Jacobian Ratio: 1

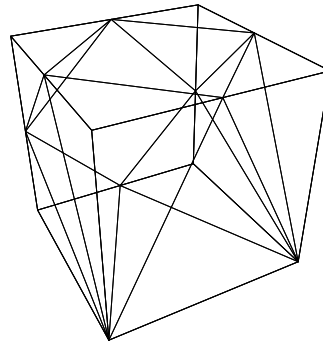
## Pattern 39

### Node index:

11 12 15 16 17 18 19

### List of Elements:

Tetrahedra 2 3 11 15  
Tetrahedra 0 1 11 12  
Tetrahedra 15 18 7 19  
Tetrahedra 12 19 4 16  
Pyramid 11 15 19 12 18  
Tetrahedra 2 18 15 11  
Tetrahedra 11 18 12 17  
Pyramid 16 19 18 17 12  
Tetrahedra 2 17 18 11  
Tetrahedra 2 17 6 18  
Tetrahedra 1 2 11 17  
Tetrahedra 1 11 12 17  
Tetrahedra 1 12 16 17  
Tetrahedra 1 17 16 5



Aspect Ratio:  
0.657945

Jacobian Ratio: 1

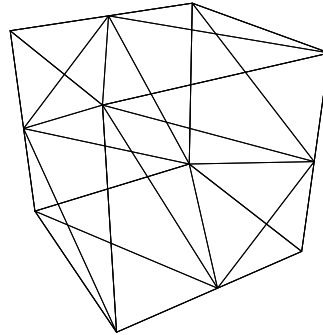
## Pattern 40

### Node index:

9 12 14 19

### List of Elements:

Tetrahedra 6 19 7 14  
Tetrahedra 3 14 7 19  
Tetrahedra 2 3 9 14  
Tetrahedra 0 9 3 12  
Pyramid 9 12 19 14 3  
Pyramid 9 14 19 12 5  
Tetrahedra 5 6 14 19  
Tetrahedra 4 19 5 12  
Tetrahedra 0 1 9 12  
Tetrahedra 1 12 5 9



Aspect Ratio:  
0.555405

Jacobian Ratio: 1

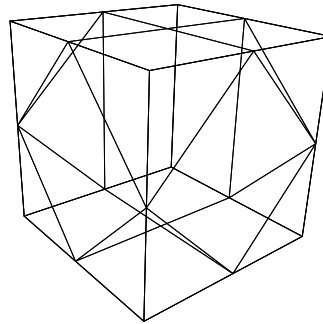
## Pattern 41

### Node index:

8 9 10 11 12 13 14 16 17 18 19 20 25

### List of Elements:

Hexaedra 3 11 20 10 7 19 25 18  
Pyramid 10 18 25 20 14  
Pyramid 2 10 20 9 14  
Pyramid 25 18 6 17 14  
Tetrahedra 14 17 25 20  
Pyramid 0 8 20 11 12  
Pyramid 11 20 25 19 12  
Pyramid 4 19 25 16 12  
Tetrahedra 25 16 12 20  
Tetrahedra 25 13 16 20  
Tetrahedra 17 13 25 20  
Pyramid 5 16 25 17 13  
Pyramid 1 9 20 8 13  
Pyramid 8 12 16 13 20  
Pyramid 13 17 14 9 20



Aspect Ratio:  
0.704974

Jacobian Ratio: 1

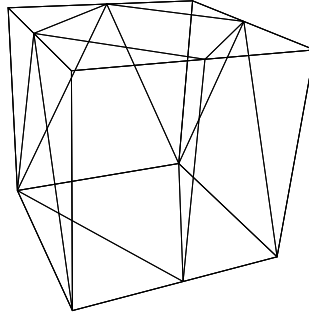
## Pattern 42

### Node index:

9 16 17 18 19

### List of Elements:

Tetrahedra 3 19 18 7  
Tetrahedra 2 18 3 9  
Tetrahedra 0 3 19 9  
Tetrahedra 9 19 18 3  
Tetrahedra 4 19 16 0  
Tetrahedra 9 16 19 0  
Tetrahedra 0 1 9 16  
Pyramid 16 19 18 17 9  
Pyramid 1 5 17 9 16  
Pyramid 2 9 17 6 18



Aspect Ratio:  
0.633527

Jacobian Ratio: 1

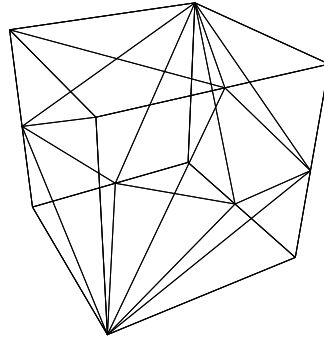
## Pattern 43

### Node index:

10 11 12 14 17

### List of Elements:

Tetrahedra 3 10 7 11  
Tetrahedra 1 14 2 10  
Tetrahedra 0 1 11 12  
Tetrahedra 7 10 14 11  
Tetrahedra 11 14 7 17  
Tetrahedra 6 17 7 14  
Tetrahedra 1 10 11 14  
Tetrahedra 1 17 14 11  
Tetrahedra 7 12 11 17  
Tetrahedra 1 12 17 11  
Tetrahedra 4 7 17 12  
Tetrahedra 4 17 5 12  
Tetrahedra 1 12 5 17



Aspect Ratio:  
0.593547

Jacobian Ratio: 1



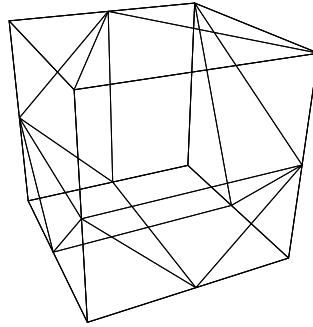
## Pattern 44

### Node index:

8 9 10 11 12 13 14 19 20

### List of Elements:

Prism 11 19 20 3 7 10  
Pyramid 10 7 19 20 14  
Tetrahedra 6 19 7 14  
Pyramid 2 10 20 9 14  
Pyramid 0 8 20 11 12  
Tetrahedra 11 19 12 20  
Tetrahedra 12 13 8 20  
Pyramid 1 9 20 8 13  
Tetrahedra 19 13 12 20  
Pyramid 12 4 5 13 19  
Tetrahedra 13 19 14 20  
Tetrahedra 13 14 9 20  
Pyramid 13 5 6 14 19



Aspect Ratio:  
0.649862

Jacobian Ratio: 1

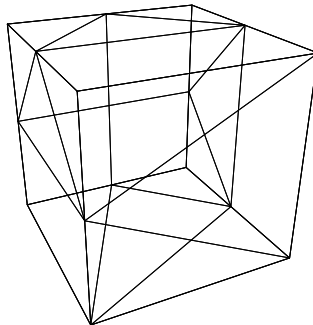
## Pattern 45

### Node index:

10 11 12 13 15 16 18 19 24

### List of Elements:

Pyramid 24 15 7 19 18  
Pyramid 11 3 15 24 10  
Pyramid 12 24 19 4 16  
Prism 0 1 11 12 13 24  
Pyramid 1 11 24 13 10  
Tetrahedra 16 19 18 24  
Tetrahedra 12 16 13 24  
Tetrahedra 10 18 15 24  
Tetrahedra 10 18 24 13  
Tetrahedra 13 16 18 24  
Tetrahedra 1 2 10 13  
Pyramid 2 6 18 10 13  
Pyramid 5 16 18 6 13



Aspect Ratio:  
0.649862

Jacobian Ratio: 1

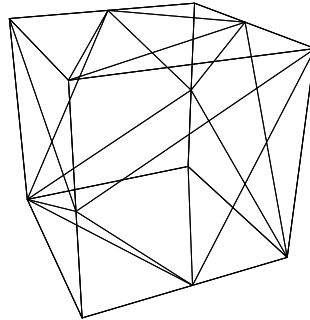
## Pattern 46

### Node index:

9 13 15 18 19

### List of Elements:

Tetrahedra 2 3 9 15  
Tetrahedra 0 9 3 15  
Tetrahedra 0 1 9 13  
Tetrahedra 0 13 9 15  
Tetrahedra 2 18 15 9  
Tetrahedra 6 18 2 9  
Tetrahedra 15 18 7 19  
Tetrahedra 0 15 19 13  
Tetrahedra 13 19 18 15  
Tetrahedra 13 18 9 15  
Tetrahedra 4 0 19 13  
Tetrahedra 4 19 5 13  
Tetrahedra 5 19 18 13  
Tetrahedra 5 6 13 18  
Tetrahedra 13 6 9 18



Aspect Ratio:  
0.54986

Jacobian Ratio: 1

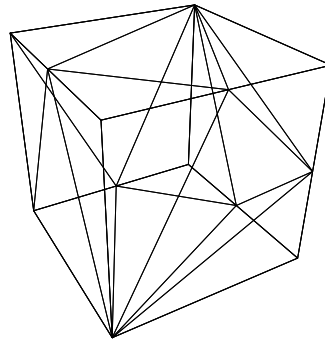
## Pattern 47

### Node index:

10 11 14 16 17

### List of Elements:

Tetrahedra 10 7 3 11  
Tetrahedra 1 2 10 14  
Tetrahedra 10 14 7 17  
Tetrahedra 6 17 7 14  
Tetrahedra 4 7 16 11  
Tetrahedra 4 0 11 16  
Tetrahedra 0 1 11 16  
Pyramid 11 16 17 10 7  
Pyramid 11 10 17 16 1  
Tetrahedra 1 17 14 10  
Tetrahedra 1 5 17 16



Aspect Ratio:  
0.543907

Jacobian Ratio: 1

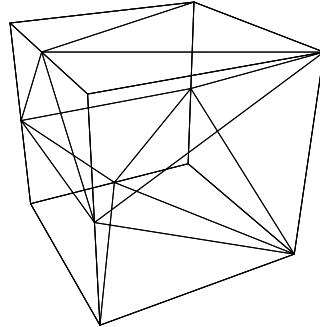
## Pattern 48

### Node index:

11 12 13 15 16

### List of Elements:

Pyramid 0 12 13 1 11  
Tetrahedra 2 15 3 11  
Tetrahedra 1 2 11 13  
Tetrahedra 2 15 11 13  
Tetrahedra 11 15 12 13  
Tetrahedra 2 6 15 13  
Pyramid 12 15 7 4 16  
Tetrahedra 7 15 6 16  
Tetrahedra 12 16 13 15  
Tetrahedra 16 6 13 15  
Tetrahedra 16 13 6 5



Aspect Ratio:  
0.632368

Jacobian Ratio: 1

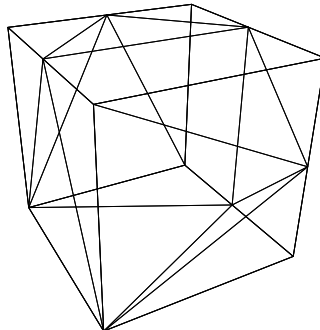
## Pattern 49

### Node index:

10 14 16 18 19

### List of Elements:

Pyramid 3 10 18 7 19  
Tetrahedra 0 3 19 10  
Tetrahedra 1 2 10 14  
Tetrahedra 0 4 16 19  
Tetrahedra 0 19 16 10  
Tetrahedra 1 0 16 10  
Tetrahedra 16 19 18 10  
Tetrahedra 10 14 18 16  
Tetrahedra 1 14 10 16  
Tetrahedra 1 16 5 14  
Pyramid 5 16 18 6 14



Aspect Ratio:  
0.632368

Jacobian Ratio: 1

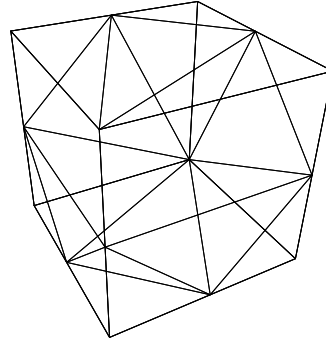
## Pattern 50

### Node index:

8 9 12 13 14 18 19

### List of Elements:

Tetrahedra 0 8 3 12  
Tetrahedra 2 3 9 14  
Tetrahedra 1 9 8 13  
Tetrahedra 3 8 9 13  
Tetrahedra 12 13 8 3  
Tetrahedra 13 14 9 3  
Tetrahedra 3 19 12 13  
Tetrahedra 3 18 7 19  
Tetrahedra 3 18 19 13  
Tetrahedra 3 14 18 13  
Pyramid 12 4 5 13 19  
Tetrahedra 5 19 18 13  
Pyramid 13 5 6 14 18



Aspect Ratio:  
0.599451

Jacobian Ratio: 1

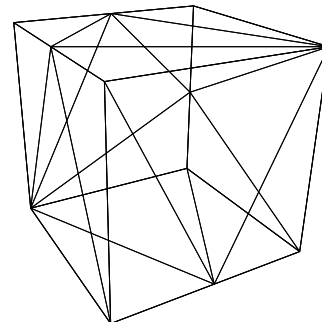
## Pattern 51

### Node index:

9 15 16 19

### List of Elements:

Tetrahedra 2 3 9 15  
Tetrahedra 0 9 3 15  
Tetrahedra 6 15 2 9  
Tetrahedra 6 7 15 19  
Tetrahedra 0 6 9 15  
Tetrahedra 0 15 19 6  
Tetrahedra 0 19 4 16  
Tetrahedra 6 16 19 0  
Tetrahedra 0 16 9 6  
Tetrahedra 0 1 9 16  
Tetrahedra 5 16 6 9  
Tetrahedra 1 5 9 16



Aspect Ratio:  
0.56003

Jacobian Ratio: 1

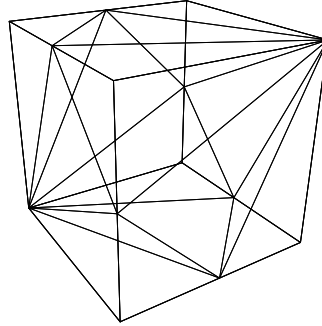
## Pattern 52

### Node index:

9 10 13 15 16 19

### List of Elements:

Tetrahedra 0 15 10 3  
Tetrahedra 2 9 6 10  
Tetrahedra 6 19 7 15  
Tetrahedra 0 4 16 19  
Tetrahedra 0 1 9 13  
Tetrahedra 6 15 10 0  
Tetrahedra 0 9 10 6  
Tetrahedra 0 15 19 6  
Tetrahedra 9 13 6 0  
Tetrahedra 6 16 19 0  
Tetrahedra 0 16 13 6  
Tetrahedra 5 6 13 16



Aspect Ratio:  
0.586226

Jacobian Ratio: 1

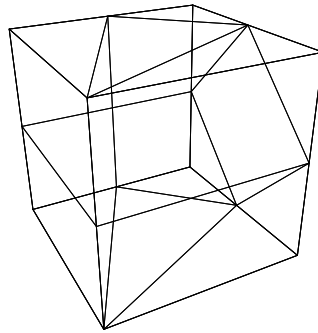
## Pattern 53

### Node index:

10 11 12 13 14 15 18 19 24

### List of Elements:

Prism 0 1 11 12 13 24  
Prism 12 13 24 4 5 19  
Pyramid 7 19 24 15 18  
Pyramid 3 15 24 11 10  
Pyramid 1 11 24 13 10  
Pyramid 10 14 18 15 24  
Tetrahedra 24 14 13 10  
Tetrahedra 24 13 14 18  
Pyramid 1 13 14 2 10  
Pyramid 5 13 24 19 18  
Pyramid 13 5 6 14 18



Aspect Ratio:  
0.623327

Jacobian Ratio: 1

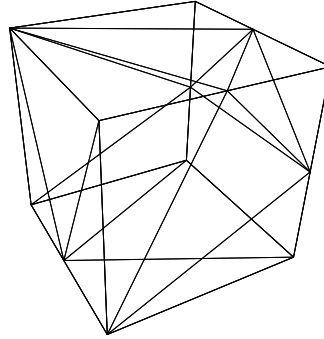
## Pattern 54

### Node index:

8 14 15 17 18

### List of Elements:

Tetrahedra 0 8 3 15  
Pyramid 2 14 15 3 8  
Tetrahedra 1 2 8 14  
Tetrahedra 0 4 8 15  
Tetrahedra 4 7 18 15  
Tetrahedra 14 18 15 17  
Tetrahedra 4 18 17 15  
Tetrahedra 14 18 17 6  
Tetrahedra 8 14 15 17  
Tetrahedra 8 17 15 4  
Tetrahedra 4 17 5 8  
Tetrahedra 1 17 14 8  
Tetrahedra 1 5 17 8



Aspect Ratio:  
0.580319

Jacobian Ratio: 1

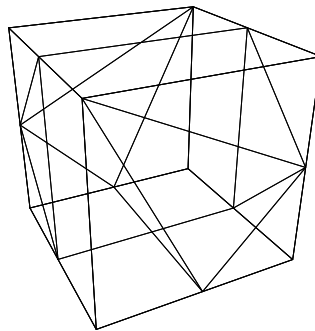
## Pattern 55

### Node index:

8 9 10 11 12 14 16 18 20

### List of Elements:

Prism 3 7 11 10 18 20  
Pyramid 0 8 20 11 12  
Pyramid 11 20 18 7 12  
Pyramid 4 7 18 16 12  
Tetrahedra 12 18 16 20  
Tetrahedra 8 12 16 20  
Tetrahedra 10 14 18 20  
Pyramid 9 2 10 20 14  
Tetrahedra 14 16 18 20  
Pyramid 5 16 18 6 14  
Pyramid 9 20 16 5 14  
Prism 8 20 16 1 9 5



Aspect Ratio:  
0.585572

Jacobian Ratio: 1

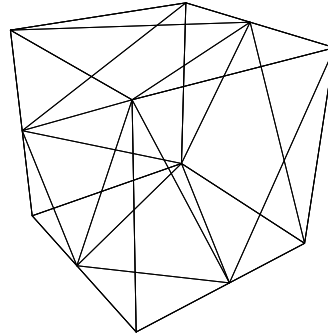
## Pattern 56

### Node index:

8 9 12 18

### List of Elements:

Tetrahedra 0 8 3 12  
Tetrahedra 3 7 12 18  
Tetrahedra 4 7 18 12  
Tetrahedra 4 18 5 12  
Pyramid 8 5 18 3 12  
Tetrahedra 2 3 9 18  
Tetrahedra 9 6 2 18  
Pyramid 8 3 18 5 9  
Tetrahedra 5 18 6 9  
Tetrahedra 1 5 9 8



Aspect Ratio:  
0.566426

Jacobian Ratio: 1

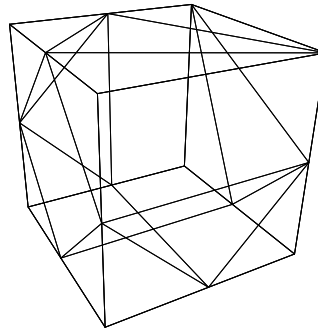
## Pattern 57

### Node index:

8 9 10 11 12 13 14 16 19 20

### List of Elements:

Prism 3 10 7 11 20 19  
Pyramid 0 8 20 11 12  
Tetrahedra 11 19 12 20  
Tetrahedra 4 19 16 12  
Tetrahedra 12 19 16 20  
Pyramid 8 12 16 13 20  
Pyramid 1 9 20 8 13  
Pyramid 10 7 19 20 14  
Tetrahedra 14 16 19 20  
Tetrahedra 6 19 7 14  
Tetrahedra 6 16 19 14  
Pyramid 2 10 20 9 14  
Tetrahedra 9 13 14 20  
Tetrahedra 13 16 14 20  
Pyramid 13 5 6 14 16



Aspect Ratio:  
0.673675

Jacobian Ratio: 1

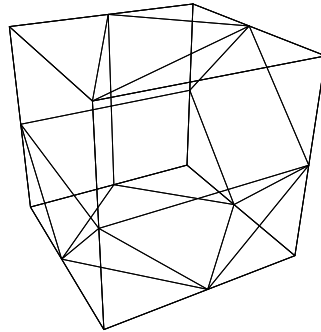
## Pattern 58

### Node index:

8 9 10 11 12 13 14 15 18 19 24

### List of Elements:

Pyramid 11 3 15 24 10  
Pyramid 0 11 24 12 8  
Pyramid 8 9 10 11 24  
Tetrahedra 9 14 2 10  
Pyramid 7 19 24 15 18  
Pyramid 10 14 18 15 24  
Tetrahedra 9 14 10 24  
Tetrahedra 8 13 9 24  
Tetrahedra 1 13 9 8  
Tetrahedra 13 14 9 24  
Tetrahedra 12 13 8 24  
Tetrahedra 13 18 14 24  
Prism 12 13 24 4 5 19  
Pyramid 5 13 24 19 18  
Pyramid 13 5 6 14 18



Aspect Ratio:  
0.730002

Jacobian Ratio: 1

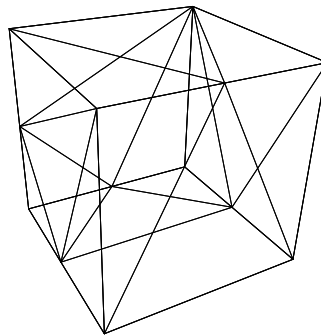
## Pattern 59

### Node index:

8 10 11 12 17

### List of Elements:

Tetrahedra 7 10 11 3  
Tetrahedra 8 11 0 12  
Tetrahedra 6 7 10 17  
Tetrahedra 11 10 7 17  
Tetrahedra 7 12 11 17  
Tetrahedra 4 12 7 17  
Tetrahedra 4 17 5 12  
Tetrahedra 8 10 11 17  
Tetrahedra 8 17 11 12  
Tetrahedra 5 8 12 17  
Tetrahedra 2 17 6 10  
Tetrahedra 1 5 17 8  
Pyramid 1 2 10 8 17



Aspect Ratio:  
0.56836

Jacobian Ratio: 1



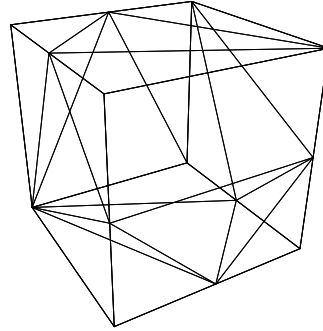
## Pattern 60

### Node index:

9 10 13 14 16 19

### List of Elements:

Tetrahedra 2 10 9 14  
Tetrahedra 0 1 9 13  
Tetrahedra 3 10 7 19  
Tetrahedra 4 0 19 16  
Tetrahedra 0 3 19 10  
Tetrahedra 7 10 14 19  
Tetrahedra 6 7 14 19  
Pyramid 9 16 19 10 0  
Pyramid 9 10 19 16 14  
Tetrahedra 6 16 19 14  
Tetrahedra 0 16 13 9  
Tetrahedra 13 14 9 16  
Pyramid 5 6 14 13 16



Aspect Ratio:  
0.52625

Jacobian Ratio: 1

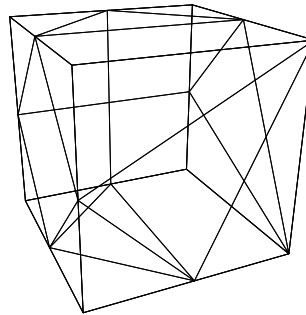
## Pattern 61

### Node index:

8 9 11 12 13 15 16 18 19 24

### List of Elements:

Prism 15 3 2 24 11 9  
Pyramid 0 11 24 12 8  
Tetrahedra 9 24 11 8  
Tetrahedra 8 9 24 13  
Tetrahedra 8 1 9 13  
Pyramid 4 12 24 19 16  
Pyramid 7 19 24 15 18  
Tetrahedra 16 19 18 24  
Pyramid 8 12 16 13 24  
Pyramid 9 2 15 24 18  
Tetrahedra 6 18 2 9  
Tetrahedra 13 18 9 24  
Tetrahedra 16 18 13 24  
Tetrahedra 9 13 6 18  
Pyramid 5 16 18 6 13



Aspect Ratio:  
0.673675

Jacobian Ratio: 1

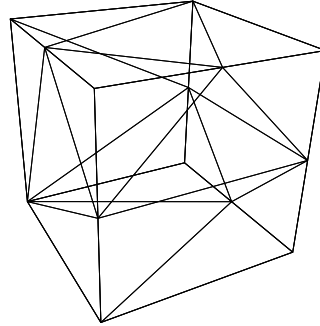
## Pattern 62

### Node index:

10 13 14 15 16 17

### List of Elements:

Tetrahedra 0 10 3 15  
Pyramid 7 15 14 6 17  
Tetrahedra 0 4 16 15  
Tetrahedra 4 7 16 15  
Tetrahedra 7 17 16 15  
Tetrahedra 0 1 10 13  
Pyramid 13 16 15 10 0  
Tetrahedra 14 15 10 17  
Pyramid 13 10 15 16 17  
Tetrahedra 5 16 17 13  
Tetrahedra 13 17 14 10  
Pyramid 1 13 14 2 10



Aspect Ratio:  
0.53559

Jacobian Ratio: 1

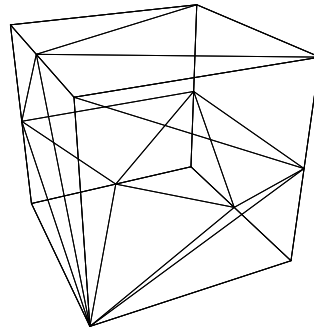
## Pattern 63

### Node index:

10 11 12 14 15 16

### List of Elements:

Tetrahedra 0 1 11 12  
Tetrahedra 3 11 10 15  
Tetrahedra 1 2 10 14  
Tetrahedra 1 10 11 15  
Tetrahedra 12 11 15 1  
Tetrahedra 14 15 10 1  
Pyramid 12 15 7 4 16  
Tetrahedra 1 12 16 15  
Tetrahedra 14 16 15 1  
Tetrahedra 1 16 5 14  
Pyramid 14 6 7 15 16  
Tetrahedra 5 16 6 14



Aspect Ratio:  
0.589858

Jacobian Ratio: 1

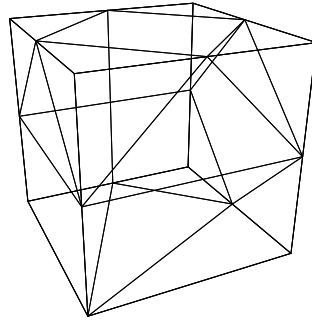
## Pattern 64

### Node index:

10 11 12 13 14 15 16 17 18 19 24

### List of Elements:

Prism 24 13 12 11 1 0  
Pyramid 4 12 24 19 16  
Pyramid 24 15 7 19 18  
Pyramid 11 3 15 24 10  
Pyramid 1 11 24 13 10  
Tetrahedra 12 16 13 24  
Pyramid 14 18 15 10 24  
Tetrahedra 24 14 13 10  
Pyramid 1 13 14 2 10  
Tetrahedra 24 14 18 17  
Tetrahedra 13 17 14 24  
Tetrahedra 16 17 13 24  
Pyramid 16 19 18 17 24  
Tetrahedra 6 17 18 14  
Tetrahedra 16 17 5 13



Aspect Ratio:  
0.726483

Jacobian Ratio: 1

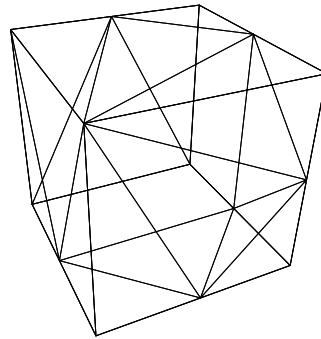
## Pattern 65

### Node index:

8 9 10 14 18 19

### List of Elements:

Pyramid 3 10 18 7 19  
Pyramid 0 8 10 3 19  
Tetrahedra 0 4 8 19  
Tetrahedra 4 19 5 8  
Tetrahedra 8 10 19 5  
Tetrahedra 5 19 18 10  
Tetrahedra 10 14 18 5  
Tetrahedra 8 9 10 5  
Tetrahedra 1 9 8 5  
Tetrahedra 9 2 10 14  
Tetrahedra 9 14 10 5  
Tetrahedra 5 18 6 14



Aspect Ratio:  
0.589858

Jacobian Ratio: 1

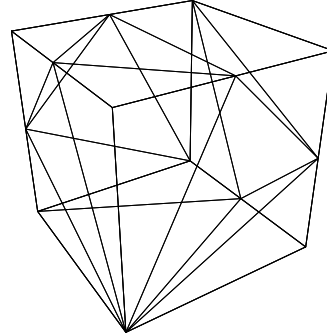
## Pattern 66

### Node index:

10 12 14 16 17 19

### List of Elements:

Tetrahedra 1 2 10 14  
Tetrahedra 0 10 3 12  
Tetrahedra 0 1 10 12  
Tetrahedra 4 19 16 12  
Tetrahedra 3 7 19 10  
Tetrahedra 12 3 19 10  
Tetrahedra 7 10 14 19  
Pyramid 6 17 19 7 14  
Pyramid 12 16 14 10 19  
Pyramid 12 10 14 16 1  
Tetrahedra 16 19 17 14  
Tetrahedra 1 17 14 16  
Tetrahedra 1 5 17 16



Aspect Ratio:  
0.52625

Jacobian Ratio: 1

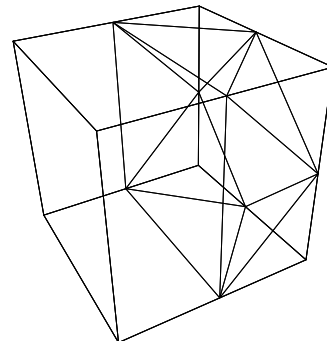
## Pattern 67

### Node index:

9 10 11 14 15 17 18 19

### List of Elements:

Tetrahedra 3 11 10 15  
Tetrahedra 7 18 19 15  
Tetrahedra 2 10 9 14  
Tetrahedra 11 15 19 10  
Pyramid 10 14 18 15 19  
Tetrahedra 19 18 17 14  
Tetrahedra 19 17 10 14  
Tetrahedra 17 14 9 10  
Tetrahedra 6 17 18 14  
Pyramid 11 19 17 9 10  
Hexaedra 4 5 1 0 19 17 9 11



Aspect Ratio:  
0.640494

Jacobian Ratio: 1

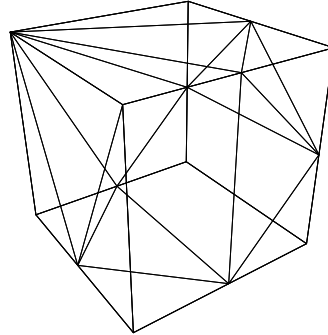
## Pattern 68

### Node index:

8 9 11 14 15 17 18

### List of Elements:

Prism 14 2 9 15 3 11  
Tetrahedra 7 18 4 15  
Tetrahedra 15 14 18 17  
Tetrahedra 4 18 17 15  
Tetrahedra 6 17 18 14  
Pyramid 11 9 14 15 17  
Tetrahedra 8 9 11 17  
Tetrahedra 4 11 15 17  
Tetrahedra 0 8 11 4  
Tetrahedra 4 8 11 17  
Tetrahedra 5 4 17 8  
Pyramid 1 5 17 9 8



Aspect Ratio:  
0.608635

Jacobian Ratio: 1

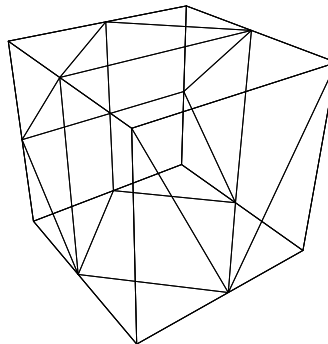
## Pattern 69

### Node index:

8 9 10 11 12 15 16 18 19 24

### List of Elements:

Pyramid 0 11 24 12 8  
Pyramid 11 3 15 24 10  
Pyramid 12 24 19 4 16  
Pyramid 24 15 7 19 18  
Tetrahedra 8 12 16 24  
Tetrahedra 19 18 16 24  
Tetrahedra 10 18 15 24  
Pyramid 8 9 10 11 24  
Tetrahedra 8 16 9 24  
Tetrahedra 16 18 9 24  
Tetrahedra 9 18 10 24  
Pyramid 8 16 5 1 9  
Pyramid 6 5 16 18 9  
Pyramid 10 2 6 18 9



Aspect Ratio:  
0.735034

Jacobian Ratio: 1

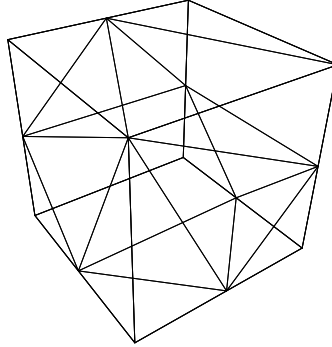
## Pattern 70

### Node index:

8 9 10 12 14 15 19

### List of Elements:

Prism 12 8 0 15 10 3  
Pyramid 12 8 10 15 19  
Pyramid 15 14 6 7 19  
Tetrahedra 15 10 14 19  
Tetrahedra 5 8 12 19  
Tetrahedra 5 4 19 12  
Tetrahedra 8 10 19 5  
Tetrahedra 19 10 14 5  
Tetrahedra 5 19 6 14  
Tetrahedra 2 10 9 14  
Tetrahedra 8 9 10 5  
Tetrahedra 1 9 8 5  
Tetrahedra 5 14 9 10



Aspect Ratio:  
0.568155

Jacobian Ratio: 1

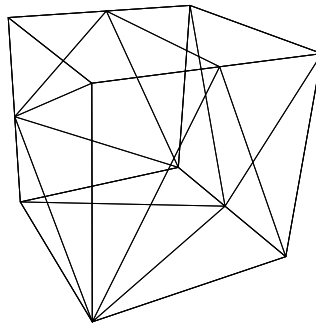
## Pattern 71

### Node index:

10 12 17 19

### List of Elements:

Tetrahedra 0 10 3 12  
Tetrahedra 3 7 19 10  
Tetrahedra 3 19 12 10  
Pyramid 17 19 7 6 10  
Tetrahedra 10 2 6 17  
Tetrahedra 19 12 10 17  
Pyramid 5 4 19 17 12  
Tetrahedra 0 1 10 12  
Tetrahedra 12 1 10 17  
Tetrahedra 1 2 10 17  
Tetrahedra 12 5 1 17



Aspect Ratio:  
0.574119

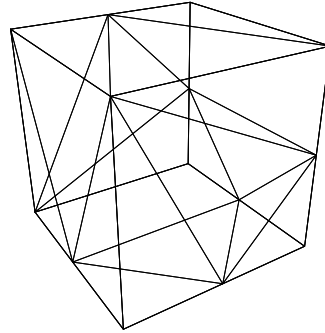
Jacobian Ratio: 1

## Pattern 72

**Node index:**  
8 9 10 14 15 19

### List of Elements:

Pyramid 15 14 6 7 19  
Pyramid 0 8 10 3 15  
Tetrahedra 0 15 19 8  
Tetrahedra 0 4 8 19  
Tetrahedra 9 2 10 14  
Tetrahedra 10 14 15 8  
Tetrahedra 8 9 10 14  
Tetrahedra 14 8 19 15  
Tetrahedra 4 19 5 8  
Tetrahedra 8 14 19 5  
Tetrahedra 5 19 6 14  
Tetrahedra 8 9 14 5  
Tetrahedra 1 9 8 5



Aspect Ratio:  
0.612352

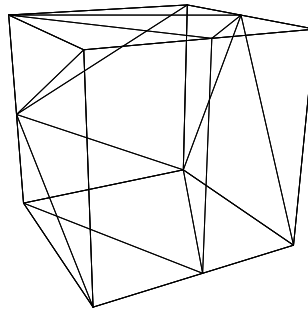
Jacobian Ratio: 1

## Pattern 73

**Node index:**  
9 12 17 18

### List of Elements:

Tetrahedra 0 9 3 12  
Tetrahedra 0 1 9 12  
Tetrahedra 7 12 3 18  
Tetrahedra 12 7 4 18  
Tetrahedra 3 2 18 9  
Tetrahedra 12 18 9 3  
Tetrahedra 12 9 18 17  
Tetrahedra 17 4 18 12  
Tetrahedra 5 4 17 12  
Pyramid 1 5 17 9 12  
Pyramid 9 17 6 2 18



Aspect Ratio:  
0.574119

Jacobian Ratio: 1

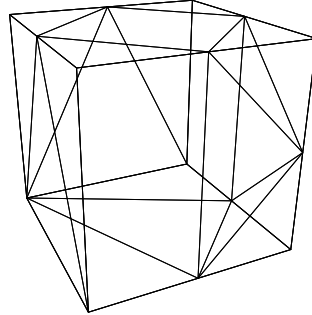
## Pattern 74

### Node index:

9 10 14 16 17 18 19

### List of Elements:

Pyramid 3 10 18 7 19  
Tetrahedra 19 16 4 0  
Tetrahedra 0 10 3 19  
Tetrahedra 19 0 10 18  
Pyramid 9 17 18 10 0  
Pyramid 19 18 17 16 0  
Tetrahedra 0 9 17 16  
Tetrahedra 1 0 16 9  
Pyramid 1 5 17 9 16  
Pyramid 18 17 9 10 14  
Tetrahedra 17 18 6 14  
Tetrahedra 9 2 10 14



Aspect Ratio:  
0.529231

Jacobian Ratio: 1

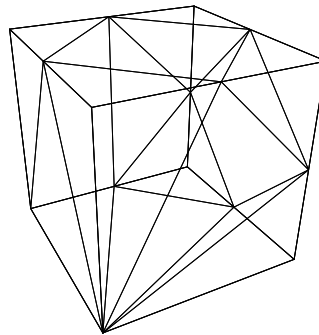
## Pattern 75

### Node index:

10 11 14 15 16 17 18 19

### List of Elements:

Tetrahedra 7 18 19 15  
Tetrahedra 3 11 10 15  
Pyramid 0 11 19 4 16  
Pyramid 15 10 14 18 11  
Tetrahedra 11 19 18 15  
Tetrahedra 14 17 18 11  
Tetrahedra 6 17 18 14  
Pyramid 19 18 17 16 11  
Tetrahedra 0 1 11 16  
Tetrahedra 1 2 10 14  
Tetrahedra 1 10 11 14  
Tetrahedra 1 17 14 11  
Tetrahedra 1 16 17 11  
Tetrahedra 5 16 17 1



Aspect Ratio:  
0.648848

Jacobian Ratio: 1



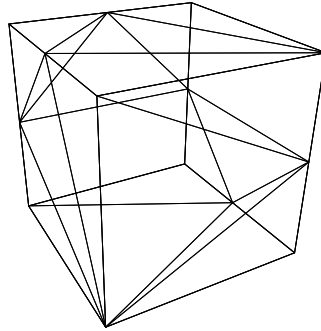
## Pattern 76

### Node index:

10 12 14 15 16 19

### List of Elements:

Pyramid 0 3 15 12 10  
Tetrahedra 1 2 10 14  
Tetrahedra 0 1 10 12  
Tetrahedra 15 14 12 10  
Tetrahedra 1 12 14 10  
Pyramid 15 14 6 7 19  
Tetrahedra 19 16 4 12  
Tetrahedra 12 14 15 19  
Tetrahedra 19 12 14 16  
Tetrahedra 16 19 6 14  
Tetrahedra 1 12 16 14  
Tetrahedra 1 16 5 14  
Tetrahedra 6 5 16 14



Aspect Ratio:  
0.599315

Jacobian Ratio: 1

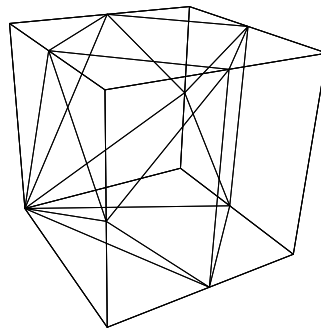
## Pattern 77

### Node index:

9 10 13 15 16 17 18 19

### List of Elements:

Tetrahedra 0 10 3 15  
Tetrahedra 18 19 7 15  
Tetrahedra 19 16 4 0  
Tetrahedra 18 19 15 0  
Tetrahedra 18 15 10 0  
Pyramid 10 9 17 18 0  
Pyramid 19 18 17 16 0  
Tetrahedra 0 1 9 13  
Tetrahedra 0 13 9 17  
Tetrahedra 0 16 13 17  
Tetrahedra 16 17 5 13  
Prism 9 2 10 17 6 18



Aspect Ratio:  
0.58597

Jacobian Ratio: 1

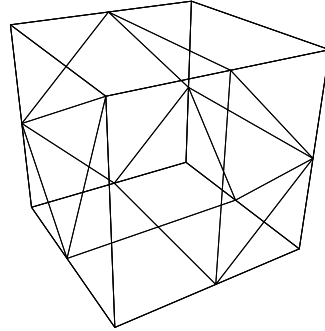
## Pattern 78

### Node index:

8 9 10 11 12 14 15 17 19 20

### List of Elements:

Pyramid 11 20 10 3 15  
Tetrahedra 15 10 14 20  
Pyramid 20 9 2 10 14  
Pyramid 0 8 20 11 12  
Pyramid 19 12 11 15 20  
Prism 17 6 14 19 7 15  
Pyramid 15 14 17 19 20  
Tetrahedra 9 17 14 20  
Tetrahedra 12 19 17 20  
Pyramid 5 4 19 17 12  
Pyramid 8 5 17 20 12  
Prism 1 8 5 9 20 17



Aspect Ratio:  
0.671754

Jacobian Ratio: 1

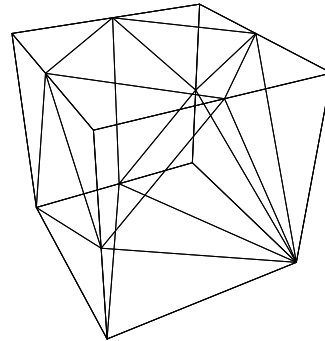
## Pattern 79

### Node index:

11 13 15 16 17 18 19

### List of Elements:

Pyramid 4 0 11 19 16  
Tetrahedra 7 19 15 18  
Tetrahedra 0 16 13 11  
Tetrahedra 0 1 11 13  
Tetrahedra 2 3 11 15  
Tetrahedra 1 2 11 13  
Tetrahedra 11 15 19 16  
Tetrahedra 2 18 15 17  
Pyramid 19 18 17 16 15  
Tetrahedra 6 17 18 2  
Pyramid 15 11 13 17 16  
Pyramid 17 13 11 15 2  
Tetrahedra 13 5 17 16



Aspect Ratio:  
0.578921

Jacobian Ratio: 1

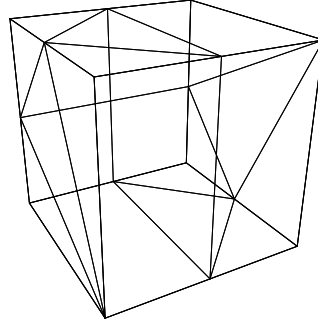
## Pattern 80

### Node index:

9 10 11 12 15 16 17 19 24

### List of Elements:

Pyramid 11 3 15 24 10  
Prism 24 19 17 15 7 6  
Pyramid 17 24 15 6 10  
Tetrahedra 9 10 11 24  
Tetrahedra 10 9 17 24  
Pyramid 9 17 6 2 10  
Pyramid 4 12 24 19 16  
Tetrahedra 17 16 19 24  
Prism 12 1 0 24 9 11  
Pyramid 12 1 9 24 16  
Tetrahedra 9 17 24 16  
Pyramid 1 5 17 9 16



Aspect Ratio:  
0.581173

Jacobian Ratio: 1

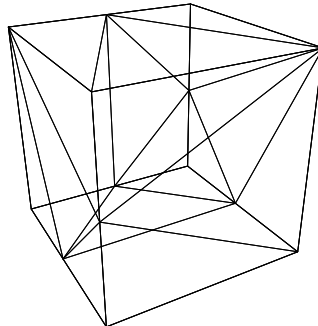
## Pattern 81

### Node index:

8 10 11 13 15 19

### List of Elements:

Pyramid 4 0 11 19 8  
Tetrahedra 3 11 10 15  
Tetrahedra 7 6 19 15  
Tetrahedra 8 10 11 13  
Tetrahedra 19 8 11 13  
Tetrahedra 11 10 15 13  
Tetrahedra 11 15 19 13  
Tetrahedra 8 4 13 19  
Tetrahedra 5 4 19 13  
Pyramid 1 2 10 8 13  
Tetrahedra 15 10 6 13  
Tetrahedra 10 2 6 13  
Tetrahedra 15 13 6 19  
Tetrahedra 19 13 6 5



Aspect Ratio:  
0.558171

Jacobian Ratio: 1

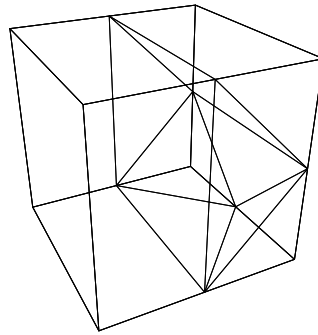
## Pattern 82

**Node index:**

9 10 11 14 15 17 19

**List of Elements:**

Tetrahedra 3 11 10 15  
Tetrahedra 2 10 9 14  
Pyramid 11 15 14 9 10  
Prism 17 6 14 19 7 15  
Prism 17 14 9 19 15 11  
Hexaedra 0 1 9 11 4 5 17 19



Aspect Ratio:  
0.599844

Jacobian Ratio: 1

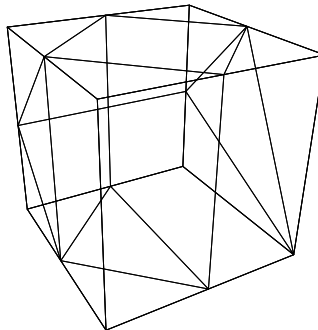
## Pattern 83

**Node index:**

8 9 11 12 15 16 17 18 19 24

**List of Elements:**

Pyramid 0 11 24 12 8  
Pyramid 12 24 19 4 16  
Pyramid 24 15 7 19 18  
Prism 24 9 11 15 2 3  
Tetrahedra 8 9 11 24  
Tetrahedra 8 12 16 24  
Pyramid 9 2 15 24 18  
Tetrahedra 24 9 18 17  
Pyramid 9 17 6 2 18  
Pyramid 19 18 17 16 24  
Pyramid 8 16 17 9 24  
Prism 1 9 8 5 17 16



Aspect Ratio:  
0.6686

Jacobian Ratio: 1

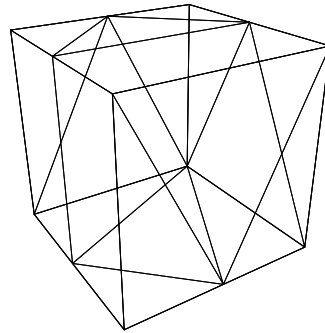
## Pattern 84

### Node index:

8 9 16 18 19

### List of Elements:

Tetrahedra 0 8 3 19  
Tetrahedra 19 7 18 3  
Pyramid 4 16 8 0 19  
Tetrahedra 9 2 3 18  
Tetrahedra 2 6 18 9  
Pyramid 9 8 19 18 3  
Pyramid 8 9 18 19 16  
Pyramid 16 18 6 5 9  
Pyramid 16 5 1 8 9



Aspect Ratio:  
0.537716

Jacobian Ratio: 1

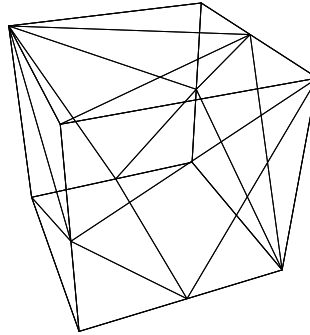
## Pattern 85

### Node index:

9 11 13 15 18

### List of Elements:

Pyramid 0 1 9 11 13  
Pyramid 11 9 2 3 15  
Tetrahedra 11 13 9 15  
Tetrahedra 0 4 13 11  
Tetrahedra 11 4 13 15  
Tetrahedra 4 7 18 15  
Tetrahedra 15 2 18 9  
Tetrahedra 18 2 6 9  
Tetrahedra 15 13 9 18  
Tetrahedra 18 9 6 13  
Tetrahedra 13 4 18 15  
Tetrahedra 5 4 18 13  
Tetrahedra 5 18 6 13



Aspect Ratio:  
0.546867

Jacobian Ratio: 1

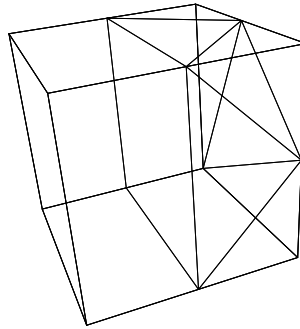
## Pattern 86

### Node index:

9 11 14 17 18 19

### List of Elements:

Pyramid 19 11 3 7 18  
Pyramid 9 2 3 11 14  
Tetrahedra 18 3 14 11  
Tetrahedra 11 9 14 18  
Pyramid 11 19 17 9 18  
Tetrahedra 9 17 14 18  
Tetrahedra 17 18 6 14  
Hexaedra 0 1 9 11 4 5 17 19



Aspect Ratio:  
0.541496

Jacobian Ratio: 1

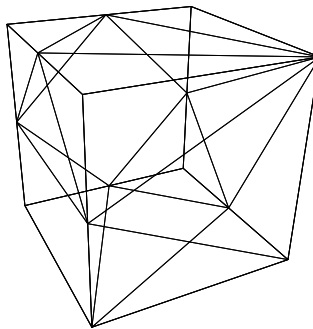
## Pattern 87

### Node index:

10 11 12 13 15 16 19

### List of Elements:

Pyramid 0 12 13 1 11  
Tetrahedra 11 10 3 15  
Tetrahedra 19 7 6 15  
Tetrahedra 16 4 19 12  
Tetrahedra 11 1 10 13  
Tetrahedra 1 2 10 13  
Tetrahedra 11 13 10 15  
Tetrahedra 15 13 10 6  
Tetrahedra 10 13 2 6  
Pyramid 19 12 11 15 13  
Tetrahedra 13 19 6 15  
Tetrahedra 12 16 13 19  
Tetrahedra 16 19 6 13  
Tetrahedra 13 16 5 6



Aspect Ratio:  
0.599939

Jacobian Ratio: 1

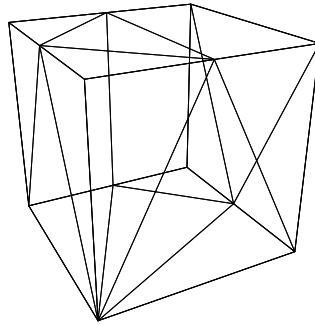
## Pattern 88

### Node index:

10 11 16 17 19

### List of Elements:

Pyramid 19 11 3 7 10  
Pyramid 4 0 11 19 16  
Pyramid 19 7 6 17 10  
Tetrahedra 0 1 11 16  
Pyramid 11 16 17 10 19  
Pyramid 10 17 16 11 1  
Tetrahedra 5 16 17 1  
Tetrahedra 10 2 6 17  
Tetrahedra 1 2 10 17



Aspect Ratio:  
0.537716

Jacobian Ratio: 1

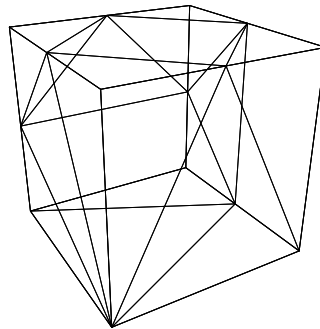
## Pattern 89

### Node index:

10 12 15 16 17 18 19

### List of Elements:

Pyramid 12 0 3 15 10  
Tetrahedra 0 1 10 12  
Tetrahedra 4 19 16 12  
Tetrahedra 19 7 18 15  
Tetrahedra 12 15 19 16  
Tetrahedra 10 18 15 17  
Pyramid 19 18 17 16 15  
Pyramid 18 10 2 6 17  
Tetrahedra 15 12 17 16  
Tetrahedra 12 10 15 17  
Tetrahedra 12 1 10 17  
Tetrahedra 12 1 17 16  
Tetrahedra 5 16 17 1  
Tetrahedra 1 2 10 17



Aspect Ratio:  
0.618184

Jacobian Ratio: 1

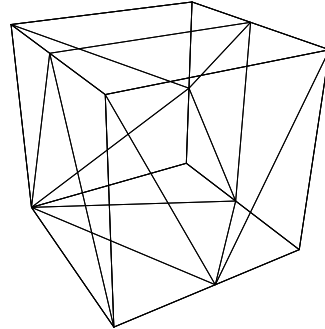
## Pattern 90

### Node index:

9 10 15 16 18

### List of Elements:

Tetrahedra 0 10 3 15  
Tetrahedra 4 0 15 16  
Pyramid 4 7 18 16 15  
Tetrahedra 15 0 10 16  
Tetrahedra 0 9 10 16  
Tetrahedra 0 1 9 16  
Tetrahedra 10 18 15 16  
Tetrahedra 16 9 10 18  
Pyramid 18 10 2 6 9  
Pyramid 6 5 16 18 9  
Tetrahedra 16 5 1 9



Aspect Ratio:  
0.569168

Jacobian Ratio: 1

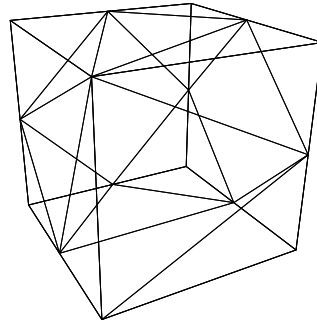
## Pattern 91

### Node index:

8 10 11 12 14 15 18 19

### List of Elements:

Tetrahedra 0 8 11 12  
Tetrahedra 3 11 10 15  
Tetrahedra 18 19 7 15  
Tetrahedra 8 10 11 15  
Pyramid 12 11 15 19 8  
Pyramid 15 10 14 18 8  
Tetrahedra 15 8 18 19  
Pyramid 1 2 10 8 14  
Tetrahedra 12 8 19 5  
Tetrahedra 5 4 19 12  
Tetrahedra 5 19 18 8  
Tetrahedra 18 5 8 14  
Tetrahedra 1 8 5 14  
Tetrahedra 5 18 6 14



Aspect Ratio:  
0.648848

Jacobian Ratio: 1



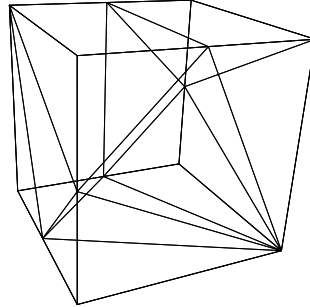
## Pattern 92

### Node index:

8 11 13 15 17 19

### List of Elements:

Tetrahedra 2 3 11 15  
Pyramid 17 19 7 6 15  
Tetrahedra 2 6 15 17  
Tetrahedra 2 11 8 13  
Tetrahedra 1 2 8 13  
Pyramid 0 11 19 4 8  
Tetrahedra 11 19 8 13  
Tetrahedra 4 13 8 19  
Pyramid 11 15 17 13 2  
Pyramid 13 17 15 11 19  
Pyramid 5 4 19 17 13



Aspect Ratio:  
0.516302

Jacobian Ratio: 1

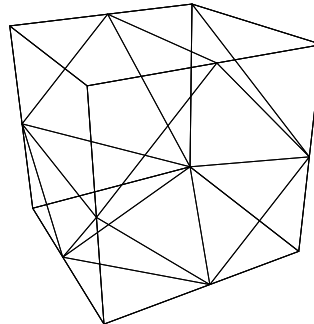
## Pattern 93

### Node index:

8 9 12 13 14 17 19

### List of Elements:

Tetrahedra 0 8 3 12  
Tetrahedra 7 3 14 19  
Pyramid 19 7 6 17 14  
Tetrahedra 2 3 9 14  
Tetrahedra 12 13 8 3  
Tetrahedra 8 9 3 13  
Tetrahedra 1 9 8 13  
Tetrahedra 19 14 17 3  
Pyramid 13 12 19 17 3  
Pyramid 9 13 17 14 3  
Prism 17 13 5 19 12 4



Aspect Ratio:  
0.531708

Jacobian Ratio: 1

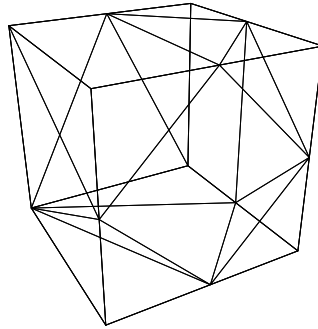
## Pattern 94

### Node index:

9 10 13 14 17 18 19

### List of Elements:

Pyramid 7 3 10 18 19  
Tetrahedra 0 10 3 19  
Tetrahedra 0 1 9 13  
Tetrahedra 2 10 9 14  
Tetrahedra 0 9 10 13  
Tetrahedra 0 13 10 19  
Tetrahedra 0 4 13 19  
Tetrahedra 10 19 17 18  
Tetrahedra 19 10 17 13  
Tetrahedra 10 14 18 17  
Tetrahedra 17 18 6 14  
Pyramid 5 4 19 17 13  
Pyramid 9 13 17 14 10



Aspect Ratio:  
0.665023

Jacobian Ratio: 1

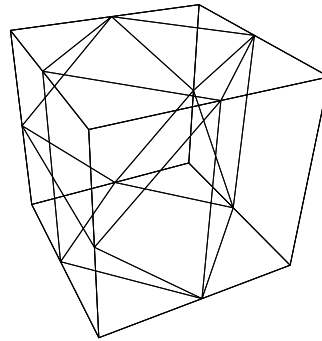
## Pattern 95

### Node index:

8 9 10 11 12 13 15 16 17 18 19 21

### List of Elements:

Tetrahedra 18 19 7 15  
Tetrahedra 3 11 10 15  
Pyramid 0 12 21 8 11  
Pyramid 12 11 15 19 21  
Pyramid 12 4 16 21 19  
Pyramid 19 18 17 16 21  
Tetrahedra 11 10 15 21  
Tetrahedra 10 18 15 21  
Pyramid 8 9 10 11 21  
Pyramid 9 17 18 10 21  
Pyramid 8 21 13 1 9  
Pyramid 21 16 5 13 17  
Tetrahedra 9 13 17 21  
Prism 9 2 10 17 6 18  
Tetrahedra 15 18 19 21



Aspect Ratio:  
0.798948

Jacobian Ratio: 1

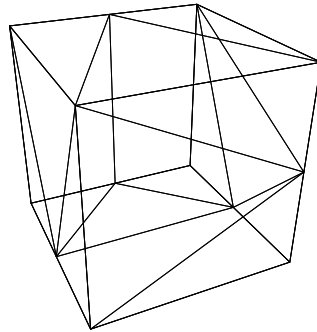
## Pattern 96

### Node index:

8 10 11 14 19

### List of Elements:

Pyramid 4 0 11 19 8  
Pyramid 19 11 3 7 10  
Tetrahedra 8 10 11 19  
Tetrahedra 19 4 8 5  
Tetrahedra 7 19 10 14  
Tetrahedra 7 14 6 19  
Tetrahedra 10 8 14 19  
Pyramid 1 2 10 8 14  
Tetrahedra 19 8 14 5  
Tetrahedra 8 1 14 5  
Tetrahedra 5 19 6 14



Aspect Ratio:  
0.611976

Jacobian Ratio: 1

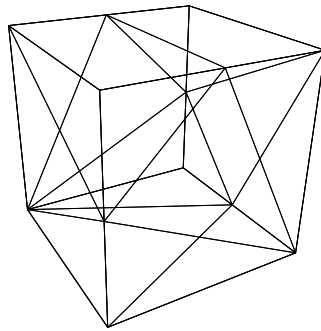
## Pattern 97

### Node index:

10 13 15 17 19

### List of Elements:

Tetrahedra 0 10 3 15  
Pyramid 7 6 17 19 15  
Tetrahedra 0 1 10 13  
Tetrahedra 1 2 10 13  
Tetrahedra 0 10 15 19  
Tetrahedra 10 6 15 17  
Tetrahedra 15 10 17 19  
Tetrahedra 10 2 6 17  
Tetrahedra 0 13 10 19  
Tetrahedra 0 19 4 13  
Tetrahedra 19 10 17 13  
Tetrahedra 10 2 17 13  
Pyramid 5 4 19 17 13



Aspect Ratio:  
0.550399

Jacobian Ratio: 1

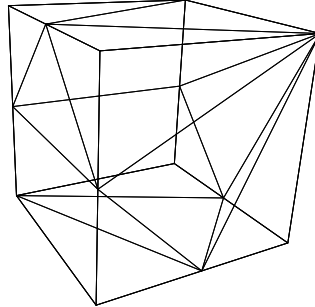
## Pattern 98

### Node index:

9 10 12 13 15 16

### List of Elements:

Pyramid 4 12 15 7 16  
Pyramid 0 3 15 12 10  
Tetrahedra 0 9 10 12  
Pyramid 0 12 13 1 9  
Tetrahedra 6 16 7 15  
Tetrahedra 15 12 6 16  
Tetrahedra 15 10 6 12  
Tetrahedra 9 2 10 6  
Tetrahedra 12 9 10 6  
Tetrahedra 12 13 9 6  
Tetrahedra 12 16 13 6  
Tetrahedra 16 5 13 6



Aspect Ratio:  
0.563038

Jacobian Ratio: 1

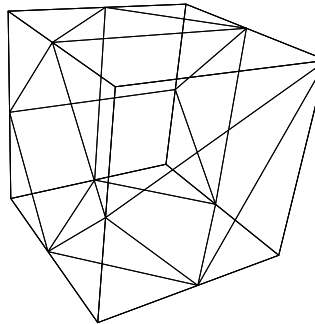
## Pattern 99

### Node index:

8 9 10 11 12 13 15 16 18 19 24

### List of Elements:

Pyramid 0 11 24 12 8  
Pyramid 11 3 15 24 10  
Pyramid 12 24 19 4 16  
Pyramid 24 15 7 19 18  
Tetrahedra 16 19 18 24  
Tetrahedra 10 18 15 24  
Pyramid 8 9 10 11 24  
Tetrahedra 24 9 10 18  
Pyramid 10 2 6 18 9  
Tetrahedra 13 8 24 9  
Tetrahedra 1 9 8 13  
Tetrahedra 24 13 9 18  
Tetrahedra 13 6 9 18  
Tetrahedra 13 16 18 24  
Pyramid 12 16 13 8 24  
Pyramid 6 5 16 18 13



Aspect Ratio:  
0.747646

Jacobian Ratio: 1

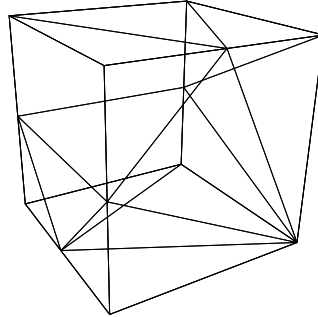
## Pattern 100

### Node index:

8 12 13 15 17

### List of Elements:

Pyramid 0 3 15 12 8  
Tetrahedra 2 3 8 15  
Tetrahedra 8 2 15 13  
Tetrahedra 12 13 8 15  
Tetrahedra 1 2 8 13  
Tetrahedra 17 7 6 15  
Pyramid 7 4 12 15 17  
Tetrahedra 2 6 15 17  
Tetrahedra 15 13 2 17  
Tetrahedra 12 13 15 17  
Pyramid 12 4 5 13 17



Aspect Ratio:  
0.569168

Jacobian Ratio: 1

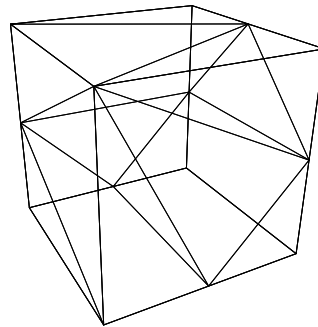
## Pattern 101

### Node index:

9 11 12 14 15 18

### List of Elements:

Pyramid 0 1 9 11 12  
Prism 14 2 9 15 3 11  
Pyramid 11 9 14 15 12  
Pyramid 7 4 12 15 18  
Tetrahedra 12 14 15 18  
Tetrahedra 12 4 5 18  
Tetrahedra 18 12 14 5  
Tetrahedra 9 5 14 12  
Tetrahedra 1 5 9 12  
Tetrahedra 14 6 18 5



Aspect Ratio:  
0.607479

Jacobian Ratio: 1

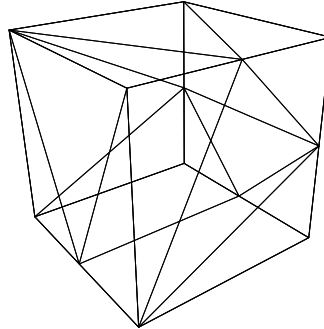
## Pattern 102

### Node index:

8 10 14 15 17

### List of Elements:

Pyramid 0 8 10 3 15  
Pyramid 1 2 10 8 14  
Tetrahedra 14 15 10 8  
Pyramid 7 15 14 6 17  
Tetrahedra 4 7 17 15  
Tetrahedra 0 4 8 15  
Tetrahedra 15 14 17 8  
Tetrahedra 1 17 14 8  
Tetrahedra 8 4 17 15  
Tetrahedra 8 1 17 5  
Tetrahedra 5 8 4 17



Aspect Ratio:  
0.611976

Jacobian Ratio: 1

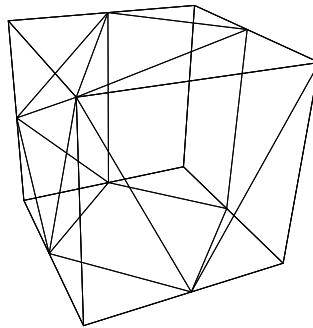
## Pattern 103

### Node index:

8 9 10 11 12 18 19

### List of Elements:

Tetrahedra 0 8 11 12  
Tetrahedra 12 8 11 19  
Tetrahedra 12 8 19 5  
Tetrahedra 5 4 19 12  
Prism 10 3 11 18 7 19  
Prism 8 11 19 9 10 18  
Pyramid 19 8 9 18 5  
Tetrahedra 1 9 8 5  
Pyramid 10 2 6 18 9  
Tetrahedra 5 18 6 9



Aspect Ratio:  
0.577

Jacobian Ratio: 1

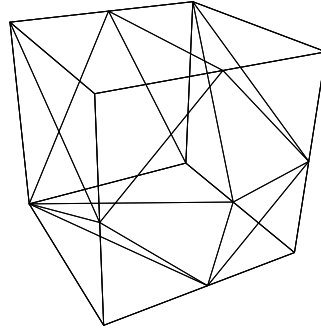
## Pattern 104

### Node index:

9 10 13 14 17 19

### List of Elements:

Tetrahedra 7 19 3 10  
Tetrahedra 3 0 10 19  
Tetrahedra 0 9 10 19  
Tetrahedra 7 19 10 14  
Tetrahedra 9 2 10 14  
Tetrahedra 9 14 10 19  
Pyramid 17 19 7 6 14  
Tetrahedra 0 13 9 19  
Tetrahedra 0 1 9 13  
Tetrahedra 4 0 19 13  
Pyramid 13 17 14 9 19  
Pyramid 5 4 19 17 13



Aspect Ratio:  
0.597526

Jacobian Ratio: 1

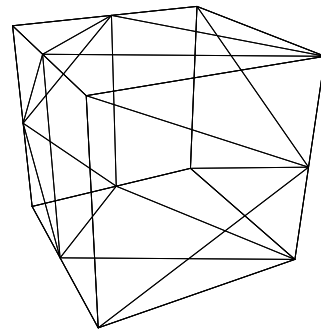
## Pattern 105

### Node index:

8 11 12 14 16 19

### List of Elements:

Tetrahedra 11 2 3 14  
Tetrahedra 2 11 8 14  
Tetrahedra 1 2 8 14  
Pyramid 19 11 3 7 14  
Tetrahedra 7 6 19 14  
Tetrahedra 0 8 11 12  
Tetrahedra 16 4 19 12  
Pyramid 8 16 19 11 12  
Pyramid 19 16 8 11 14  
Tetrahedra 19 6 16 14  
Tetrahedra 16 6 5 14  
Pyramid 16 5 1 8 14



Aspect Ratio:  
0.511314

Jacobian Ratio: 1

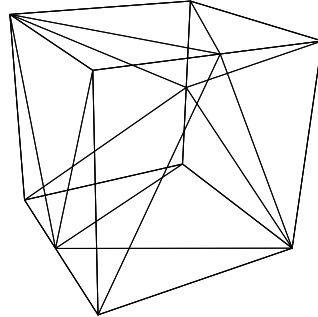
## Pattern 106

### Node index:

8 15 17

### List of Elements:

Tetrahedra 0 8 3 15  
Tetrahedra 3 8 2 15  
Tetrahedra 4 0 15 8  
Tetrahedra 17 7 6 15  
Tetrahedra 7 17 4 15  
Tetrahedra 2 6 15 17  
Tetrahedra 8 17 2 15  
Tetrahedra 8 4 17 15  
Tetrahedra 4 17 5 8  
Tetrahedra 8 1 2 17  
Tetrahedra 8 1 17 5



Aspect Ratio:  
0.630845

Jacobian Ratio: 1

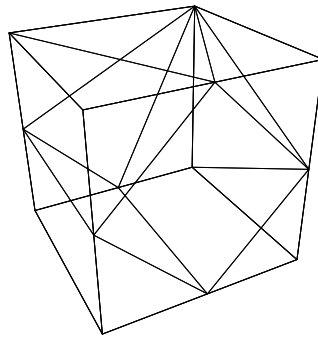
## Pattern 107

### Node index:

9 11 12 13 14 17

### List of Elements:

Prism 1 13 9 0 12 11  
Pyramid 11 9 2 3 14  
Tetrahedra 3 11 14 7  
Pyramid 11 12 17 14 7  
Prism 17 13 12 14 9 11  
Tetrahedra 7 6 17 14  
Tetrahedra 7 4 12 17  
Pyramid 12 4 5 13 17



Aspect Ratio:  
0.567645

Jacobian Ratio: 1



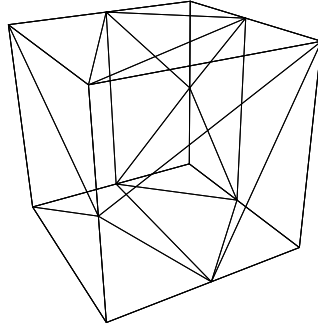
## Pattern 108

### Node index:

9 10 11 13 15 18 19

### List of Elements:

Pyramid 0 1 9 11 13  
Tetrahedra 9 10 11 13  
Pyramid 19 4 0 11 13  
Tetrahedra 4 13 19 5  
Tetrahedra 10 3 11 15  
Tetrahedra 19 7 18 15  
Pyramid 11 19 18 10 15  
Pyramid 19 11 10 18 13  
Tetrahedra 5 19 18 13  
Tetrahedra 13 9 10 18  
Pyramid 18 10 2 6 9  
Tetrahedra 6 9 13 18  
Tetrahedra 6 5 18 13



Aspect Ratio:  
0.504729

Jacobian Ratio: 1

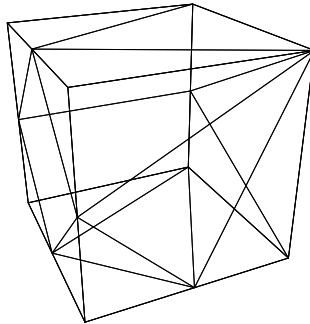
## Pattern 109

### Node index:

8 9 12 13 15 16

### List of Elements:

Pyramid 15 12 0 3 8  
Tetrahedra 9 3 8 15  
Tetrahedra 9 2 3 15  
Tetrahedra 8 9 15 13  
Tetrahedra 1 9 8 13  
Tetrahedra 15 2 6 9  
Tetrahedra 15 13 9 6  
Pyramid 7 4 12 15 16  
Pyramid 12 16 13 8 15  
Tetrahedra 16 7 6 15  
Tetrahedra 13 16 6 15  
Tetrahedra 16 13 6 5



Aspect Ratio:  
0.597526

Jacobian Ratio: 1

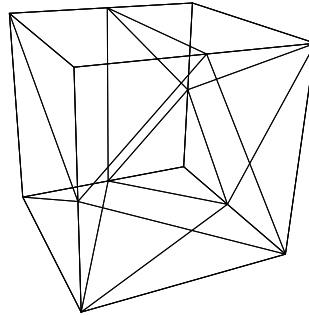
## Pattern 110

### Node index:

10 11 13 15 17 19

### List of Elements:

Tetrahedra 0 1 11 13  
Tetrahedra 1 10 11 13  
Tetrahedra 1 2 10 13  
Pyramid 19 4 0 11 13  
Tetrahedra 11 10 3 15  
Pyramid 17 19 7 6 15  
Tetrahedra 11 15 19 13  
Tetrahedra 11 10 15 13  
Tetrahedra 13 19 17 15  
Tetrahedra 6 15 10 17  
Tetrahedra 15 13 10 17  
Tetrahedra 2 6 10 17  
Tetrahedra 2 13 17 10  
Pyramid 5 4 19 17 13



Aspect Ratio:  
0.515055

Jacobian Ratio: 1

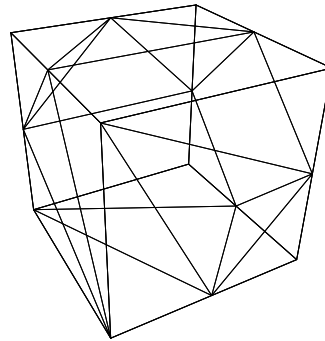
## Pattern 111

### Node index:

9 10 12 14 15 16 18 19

### List of Elements:

Pyramid 12 0 3 15 10  
Tetrahedra 9 2 10 14  
Tetrahedra 0 1 9 12  
Tetrahedra 0 9 10 12  
Tetrahedra 16 4 19 12  
Tetrahedra 19 7 18 15  
Pyramid 12 16 18 15 19  
Prism 10 15 12 14 18 16  
Pyramid 12 10 14 16 9  
Tetrahedra 1 12 16 9  
Tetrahedra 5 14 9 16  
Tetrahedra 1 16 5 9  
Pyramid 5 16 18 6 14



Aspect Ratio:  
0.554274

Jacobian Ratio: 1

## Pattern 112

**Node index:**

8 10 14 16 18

**List of Elements:**

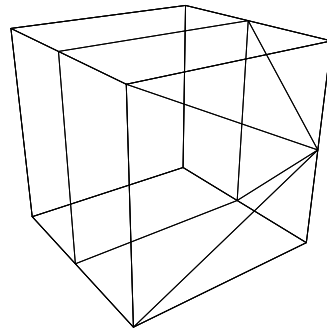
Pyramid 5 16 18 6 14

Pyramid 16 5 1 8 14

Pyramid 8 1 2 10 14

Pyramid 18 16 8 10 14

Hexaedra 0 8 10 3 4 16 18 7



Aspect Ratio:

0.538436

Jacobian Ratio: 1

## Pattern 113

**Node index:**

8 9 14 15 17 18 19

**List of Elements:**

Tetrahedra 4 0 19 8

Tetrahedra 3 0 8 15

Tetrahedra 0 15 19 8

Tetrahedra 19 7 18 15

Pyramid 3 2 14 15 9

Tetrahedra 8 9 3 15

Tetrahedra 19 8 15 9

Pyramid 15 19 17 14 18

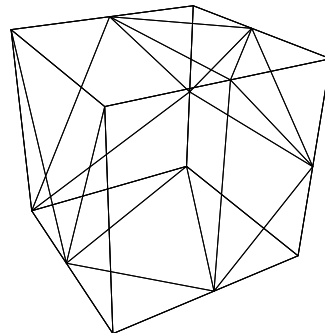
Pyramid 15 14 17 19 9

Tetrahedra 18 6 17 14

Tetrahedra 19 17 8 9

Pyramid 5 4 19 17 8

Pyramid 1 5 17 9 8



Aspect Ratio:

0.530555

Jacobian Ratio: 1

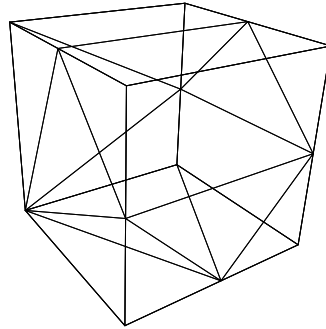
## Pattern 114

### Node index:

9 13 14 15 16 18

### List of Elements:

Pyramid 15 3 2 14 9  
Tetrahedra 0 9 3 15  
Tetrahedra 0 9 15 13  
Tetrahedra 0 1 9 13  
Tetrahedra 13 15 14 9  
Tetrahedra 4 0 15 16  
Tetrahedra 0 16 13 15  
Pyramid 4 7 18 16 15  
Pyramid 13 16 18 14 15  
Prism 16 5 13 18 6 14



Aspect Ratio:  
0.607479

Jacobian Ratio: 1

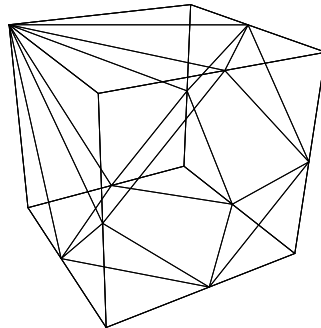
## Pattern 115

### Node index:

8 9 10 11 13 14 15 17 18

### List of Elements:

Tetrahedra 0 8 11 4  
Tetrahedra 4 7 18 15  
Tetrahedra 9 2 10 14  
Tetrahedra 11 10 3 15  
Tetrahedra 1 9 8 13  
Pyramid 8 9 10 11 13  
Pyramid 15 10 14 18 17  
Tetrahedra 18 6 17 14  
Tetrahedra 4 13 8 11  
Tetrahedra 4 18 17 15  
Pyramid 15 11 13 17 4  
Pyramid 17 13 11 15 10  
Tetrahedra 5 4 17 13  
Pyramid 13 17 14 9 10



Aspect Ratio:  
0.664971

Jacobian Ratio: 1

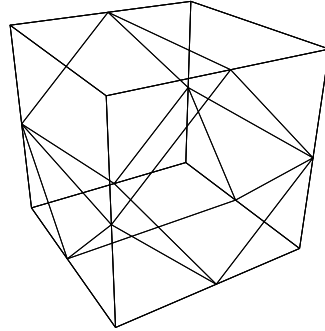
## Pattern 116

### Node index:

8 9 10 11 12 13 14 15 17 19 20

### List of Elements:

Pyramid 0 8 20 11 12  
Pyramid 1 9 20 8 13  
Pyramid 9 2 10 20 14  
Pyramid 20 10 3 11 15  
Tetrahedra 13 8 12 20  
Tetrahedra 15 10 14 20  
Pyramid 12 11 15 19 20  
Pyramid 19 15 14 17 20  
Pyramid 12 19 17 13 20  
Pyramid 13 17 14 9 20  
Prism 13 5 17 12 4 19  
Prism 17 6 14 19 7 15



Aspect Ratio:  
0.759181

Jacobian Ratio: 1

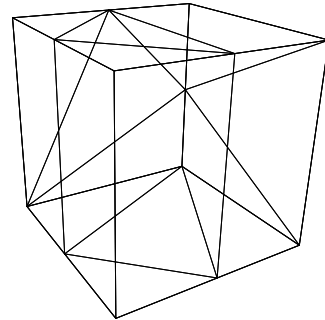
## Pattern 117

### Node index:

8 9 15 16 17 19

### List of Elements:

Tetrahedra 0 8 3 15  
Tetrahedra 8 9 3 15  
Tetrahedra 9 2 3 15  
Tetrahedra 19 0 15 8  
Pyramid 4 16 8 0 19  
Pyramid 7 6 17 19 15  
Pyramid 2 9 17 6 15  
Tetrahedra 16 8 19 15  
Tetrahedra 19 17 16 15  
Pyramid 8 16 17 9 15  
Prism 8 1 9 16 5 17



Aspect Ratio:  
0.469957

Jacobian Ratio: 1

## Pattern 118

**Node index:**

8 9 11 16 17 19

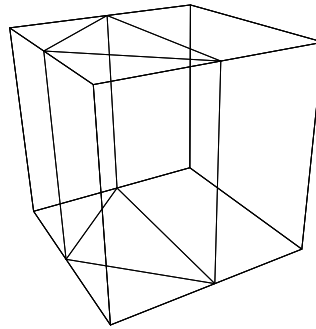
**List of Elements:**

Prism 11 0 8 19 4 16

Prism 11 8 9 19 16 17

Prism 8 1 9 16 5 17

Hexaedra 9 2 3 11 17 6 7 19



Aspect Ratio:

0.551777

Jacobian Ratio: 1

## Pattern 119

**Node index:**

9 10 11 13 14 19

**List of Elements:**

Pyramid 0 1 9 11 13

Tetrahedra 9 2 10 14

Pyramid 7 19 11 3 10

Pyramid 19 4 0 11 13

Tetrahedra 11 9 10 19

Tetrahedra 13 9 11 19

Tetrahedra 19 10 7 14

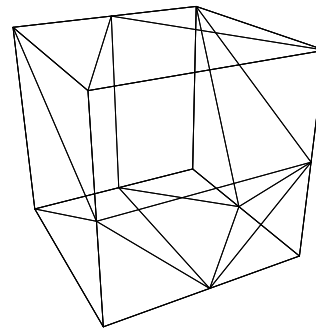
Tetrahedra 19 14 7 6

Tetrahedra 9 19 14 10

Tetrahedra 14 9 13 19

Tetrahedra 5 4 19 13

Pyramid 13 5 6 14 19



Aspect Ratio:

0.530196

Jacobian Ratio: 1

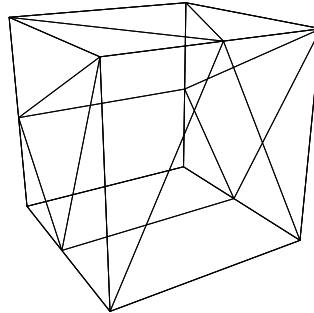
## Pattern 120

### Node index:

8 10 12 15 17

### List of Elements:

Tetrahedra 17 7 6 15  
Tetrahedra 6 15 10 17  
Tetrahedra 6 10 2 17  
Pyramid 7 4 12 15 17  
Tetrahedra 17 5 4 12  
Prism 8 0 12 10 3 15  
Pyramid 12 8 10 15 17  
Tetrahedra 5 8 12 17  
Pyramid 1 2 10 8 17  
Tetrahedra 5 1 8 17



Aspect Ratio:  
0.474382

Jacobian Ratio: 1

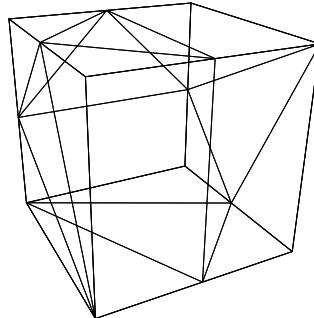
## Pattern 121

### Node index:

9 10 12 15 16 17 19

### List of Elements:

Tetrahedra 0 1 9 12  
Tetrahedra 0 9 10 12  
Pyramid 15 12 0 3 10  
Pyramid 7 6 17 19 15  
Tetrahedra 19 12 15 17  
Tetrahedra 16 4 19 12  
Tetrahedra 17 16 19 12  
Tetrahedra 6 15 10 17  
Tetrahedra 10 12 17 15  
Tetrahedra 12 9 10 17  
Pyramid 2 9 17 6 10  
Tetrahedra 12 9 17 16  
Tetrahedra 1 12 16 9  
Pyramid 9 1 5 17 16



Aspect Ratio:  
0.553396

Jacobian Ratio: 1

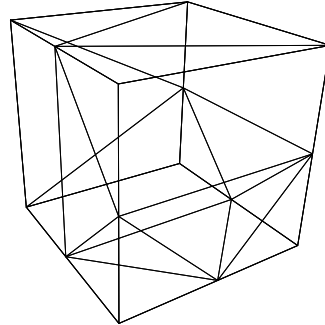
## Pattern 122

### Node index:

8 9 10 13 14 15 16

### List of Elements:

Pyramid 0 8 10 3 15  
Pyramid 0 4 16 8 15  
Tetrahedra 4 7 16 15  
Tetrahedra 8 10 15 16  
Tetrahedra 14 15 10 16  
Pyramid 6 7 15 14 16  
Pyramid 8 13 14 10 16  
Pyramid 14 13 5 6 16  
Tetrahedra 1 9 8 13  
Tetrahedra 9 2 10 14  
Pyramid 8 10 14 13 9



Aspect Ratio:  
0.548909

Jacobian Ratio: 1

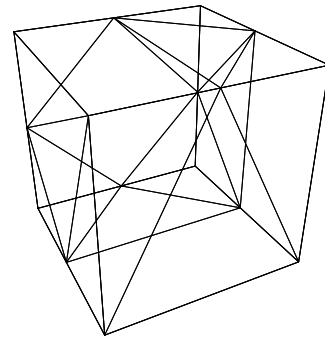
## Pattern 123

### Node index:

8 10 11 12 15 17 18 19

### List of Elements:

Tetrahedra 0 8 11 12  
Tetrahedra 11 10 3 15  
Tetrahedra 18 19 7 15  
Tetrahedra 10 18 15 17  
Tetrahedra 17 19 18 15  
Tetrahedra 11 10 15 17  
Pyramid 10 2 6 18 17  
Tetrahedra 8 10 11 17  
Pyramid 19 12 11 15 17  
Tetrahedra 11 8 17 12  
Pyramid 1 2 10 8 17  
Pyramid 5 4 19 17 12  
Tetrahedra 5 8 12 17  
Tetrahedra 8 5 1 17



Aspect Ratio:  
0.577605

Jacobian Ratio: 1



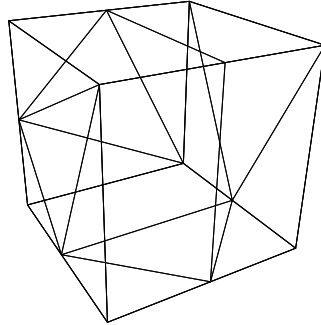
## Pattern 124

### Node index:

8 9 10 12 17 19

### List of Elements:

Pyramid 0 8 10 3 12  
Tetrahedra 3 7 19 10  
Tetrahedra 3 19 12 10  
Pyramid 7 6 17 19 10  
Tetrahedra 12 19 17 10  
Tetrahedra 8 12 17 10  
Pyramid 5 4 19 17 12  
Tetrahedra 5 8 12 17  
Tetrahedra 8 9 10 17  
Pyramid 1 5 17 9 8  
Pyramid 9 17 6 2 10



Aspect Ratio:  
0.55525

Jacobian Ratio: 1

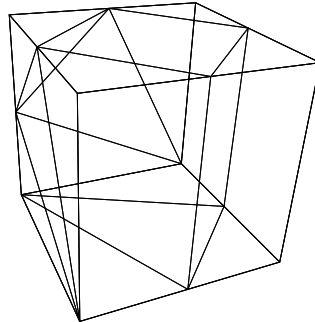
## Pattern 125

### Node index:

9 10 12 16 17 18 19

### List of Elements:

Tetrahedra 0 1 9 12  
Tetrahedra 0 9 10 12  
Tetrahedra 0 10 3 12  
Tetrahedra 12 3 19 10  
Pyramid 7 3 10 18 19  
Tetrahedra 16 4 19 12  
Pyramid 16 19 10 9 12  
Tetrahedra 12 1 9 16  
Prism 10 18 19 9 17 16  
Prism 9 2 10 17 6 18  
Pyramid 1 5 17 9 16



Aspect Ratio:  
0.532186

Jacobian Ratio: 1

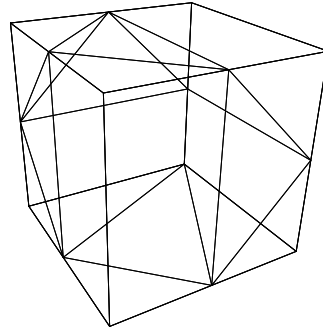
## Pattern 126

### Node index:

8 9 12 14 15 16 17 19

### List of Elements:

Pyramid 0 3 15 12 8  
Tetrahedra 3 8 9 15  
Pyramid 3 2 14 15 9  
Prism 15 7 19 14 6 17  
Tetrahedra 12 8 15 19  
Tetrahedra 8 9 15 19  
Pyramid 15 14 17 19 9  
Tetrahedra 16 4 19 12  
Tetrahedra 8 12 16 19  
Pyramid 8 16 17 9 19  
Prism 1 9 8 5 17 16



Aspect Ratio:  
0.557624

Jacobian Ratio: 1

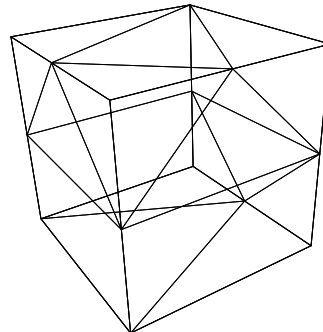
## Pattern 127

### Node index:

10 12 13 14 15 16 17

### List of Elements:

Pyramid 15 12 0 3 10  
Pyramid 1 0 12 13 10  
Pyramid 15 14 13 12 10  
Pyramid 2 1 13 14 10  
Pyramid 15 14 6 7 17  
Pyramid 7 4 12 15 16  
Tetrahedra 17 16 7 15  
Tetrahedra 16 12 15 17  
Pyramid 12 13 14 15 17  
Tetrahedra 12 16 13 17  
Tetrahedra 16 17 5 13



Aspect Ratio:  
0.547649

Jacobian Ratio: 1

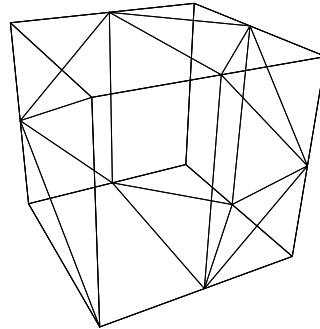
## Pattern 128

### Node index:

9 10 11 12 14 17 18 19

### List of Elements:

Prism 19 7 18 11 3 10  
Prism 19 18 17 11 10 9  
Tetrahedra 9 2 10 14  
Tetrahedra 17 18 6 14  
Pyramid 17 9 10 18 14  
Pyramid 5 4 19 17 12  
Pyramid 1 5 17 9 12  
Pyramid 0 1 9 11 12  
Pyramid 11 9 17 19 12



Aspect Ratio:  
0.587915

Jacobian Ratio: 1

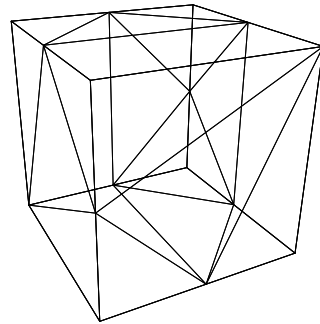
## Pattern 129

### Node index:

9 10 11 13 15 16 18 19

### List of Elements:

Tetrahedra 10 3 11 15  
Tetrahedra 18 19 7 15  
Pyramid 10 11 19 18 15  
Pyramid 4 0 11 19 16  
Pyramid 0 1 9 11 13  
Tetrahedra 0 16 13 11  
Tetrahedra 11 9 10 13  
Tetrahedra 16 13 11 19  
Pyramid 11 10 18 19 13  
Tetrahedra 16 19 18 13  
Tetrahedra 13 9 10 18  
Pyramid 2 6 18 10 9  
Tetrahedra 13 6 9 18  
Pyramid 16 18 6 5 13



Aspect Ratio:  
0.499085

Jacobian Ratio: 1

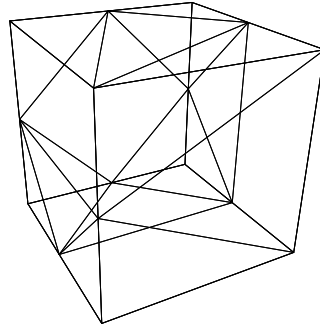
## Pattern 130

### Node index:

8 10 11 12 13 15 18 19

### List of Elements:

Tetrahedra 0 8 11 12  
Tetrahedra 10 3 11 15  
Tetrahedra 18 19 7 15  
Tetrahedra 10 11 8 13  
Pyramid 1 2 10 8 13  
Tetrahedra 12 8 11 13  
Tetrahedra 11 10 15 13  
Tetrahedra 18 15 10 13  
Pyramid 10 2 6 18 13  
Pyramid 12 11 15 19 13  
Tetrahedra 13 19 18 15  
Tetrahedra 19 13 18 5  
Tetrahedra 6 5 18 13  
Pyramid 13 12 4 5 19



Aspect Ratio:  
0.577605

Jacobian Ratio: 1

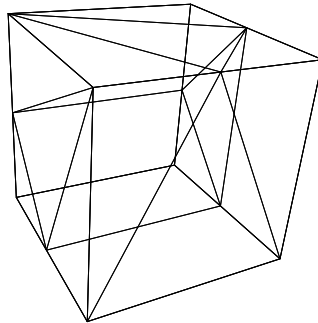
## Pattern 131

### Node index:

8 10 12 15 17 18

### List of Elements:

Prism 8 0 12 10 3 15  
Pyramid 7 4 12 15 18  
Tetrahedra 18 15 10 17  
Tetrahedra 12 17 15 18  
Tetrahedra 4 18 17 12  
Pyramid 12 8 10 15 17  
Pyramid 10 2 6 18 17  
Pyramid 1 2 10 8 17  
Tetrahedra 5 4 17 12  
Tetrahedra 12 5 8 17  
Tetrahedra 8 5 1 17



Aspect Ratio:  
0.469957

Jacobian Ratio: 1

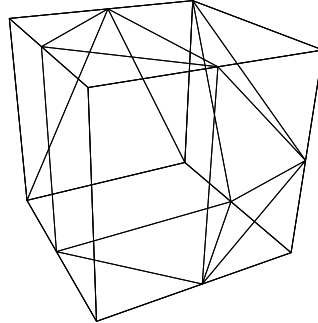
## Pattern 132

### Node index:

8 9 10 14 16 17 19

### List of Elements:

Tetrahedra 3 10 7 19  
Tetrahedra 10 14 7 19  
Pyramid 7 6 17 19 14  
Tetrahedra 9 2 10 14  
Tetrahedra 17 10 19 14  
Pyramid 0 8 10 3 19  
Pyramid 0 4 16 8 19  
Tetrahedra 19 8 10 16  
Tetrahedra 17 16 19 10  
Pyramid 9 8 16 17 10  
Tetrahedra 17 14 9 10  
Prism 1 9 8 5 17 16



Aspect Ratio:  
0.523819

Jacobian Ratio: 1

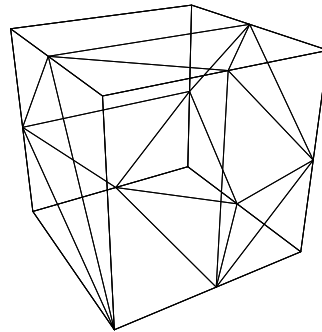
## Pattern 133

### Node index:

9 10 11 12 14 15 16 17 18

### List of Elements:

Pyramid 0 1 9 11 12  
Tetrahedra 10 3 11 15  
Tetrahedra 9 2 10 14  
Tetrahedra 11 10 15 9  
Tetrahedra 12 11 15 9  
Pyramid 15 10 14 18 9  
Prism 12 4 16 15 7 18  
Pyramid 12 15 18 16 9  
Tetrahedra 1 12 16 9  
Tetrahedra 18 17 16 9  
Pyramid 1 5 17 9 16  
Tetrahedra 17 14 9 18  
Tetrahedra 18 6 17 14



Aspect Ratio:  
0.637702

Jacobian Ratio: 1

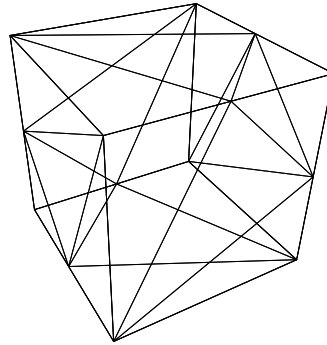
## Pattern 134

### Node index:

8 11 12 14 17 18

### List of Elements:

Tetrahedra 1 2 8 14  
Tetrahedra 8 2 11 14  
Tetrahedra 11 2 3 14  
Tetrahedra 7 4 12 18  
Tetrahedra 7 12 11 18  
Tetrahedra 7 11 3 18  
Tetrahedra 3 11 14 18  
Tetrahedra 11 0 8 12  
Pyramid 8 12 18 14 11  
Pyramid 14 18 12 8 17  
Tetrahedra 18 6 17 14  
Tetrahedra 17 4 18 12  
Tetrahedra 12 5 8 17  
Tetrahedra 8 5 1 17  
Tetrahedra 1 17 14 8  
Tetrahedra 5 4 17 12



Aspect Ratio:  
0.506184

Jacobian Ratio: 1

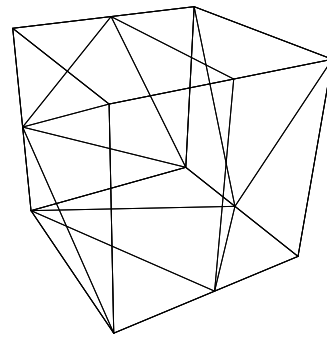
## Pattern 135

### Node index:

9 10 12 17 19

### List of Elements:

Tetrahedra 0 1 9 12  
Tetrahedra 0 9 10 12  
Tetrahedra 0 10 3 12  
Tetrahedra 12 3 19 10  
Tetrahedra 19 3 7 10  
Pyramid 7 6 17 19 10  
Tetrahedra 19 12 10 17  
Pyramid 5 4 19 17 12  
Tetrahedra 10 9 17 12  
Pyramid 1 5 17 9 12  
Pyramid 2 9 17 6 10



Aspect Ratio:  
0.517394

Jacobian Ratio: 1

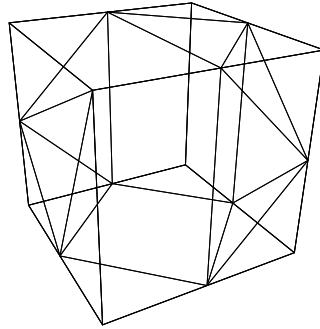
## Pattern 136

### Node index:

8 9 10 11 12 14 17 18 19

### List of Elements:

Tetrahedra 0 8 11 12  
Prism 10 3 11 18 7 19  
Pyramid 19 11 10 18 12  
Pyramid 8 9 10 11 12  
Pyramid 10 9 17 18 12  
Tetrahedra 19 18 17 12  
Pyramid 5 4 19 17 12  
Tetrahedra 17 9 8 12  
Tetrahedra 5 8 12 17  
Pyramid 9 1 5 17 8  
Tetrahedra 9 2 10 14  
Tetrahedra 17 18 6 14  
Pyramid 18 17 9 10 14



Aspect Ratio:  
0.581977

Jacobian Ratio: 1

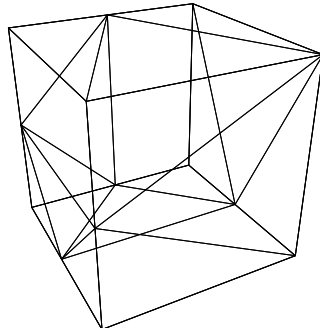
## Pattern 137

### Node index:

8 10 11 12 13 19

### List of Elements:

Tetrahedra 0 8 11 12  
Tetrahedra 10 11 8 13  
Tetrahedra 13 8 12 11  
Pyramid 3 7 19 11 10  
Tetrahedra 7 6 19 10  
Tetrahedra 12 13 11 19  
Tetrahedra 13 19 10 11  
Pyramid 1 2 10 8 13  
Tetrahedra 10 13 6 19  
Tetrahedra 2 6 10 13  
Tetrahedra 6 5 19 13  
Pyramid 13 12 4 5 19



Aspect Ratio:  
0.628867

Jacobian Ratio: 1

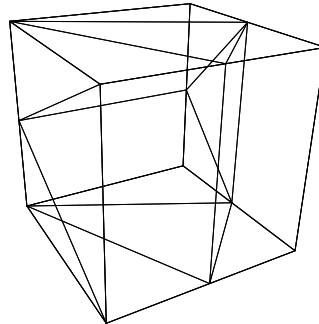
## Pattern 138

### Node index:

9 10 12 15 17 18

### List of Elements:

Tetrahedra 0 1 9 12  
Tetrahedra 0 9 10 12  
Pyramid 15 12 0 3 10  
Pyramid 7 4 12 15 18  
Tetrahedra 12 10 15 18  
Pyramid 9 17 18 10 12  
Tetrahedra 17 4 18 12  
Tetrahedra 5 4 17 12  
Pyramid 1 5 17 9 12  
Prism 9 2 10 17 6 18



Aspect Ratio:  
0.516024

Jacobian Ratio: 1

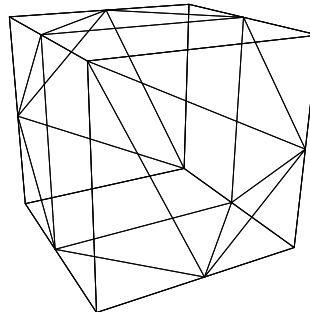
## Pattern 139

### Node index:

8 9 10 12 14 16 18 19

### List of Elements:

Pyramid 0 8 10 3 12  
Pyramid 3 10 18 7 19  
Tetrahedra 12 3 19 10  
Tetrahedra 9 2 10 14  
Tetrahedra 16 4 19 12  
Tetrahedra 19 12 10 18  
Tetrahedra 16 19 18 12  
Pyramid 10 8 16 18 12  
Pyramid 18 16 8 10 9  
Tetrahedra 10 14 18 9  
Tetrahedra 16 9 18 14  
Pyramid 16 18 6 5 14  
Tetrahedra 5 14 9 16  
Pyramid 1 8 16 5 9



Aspect Ratio:  
0.547424

Jacobian Ratio: 1



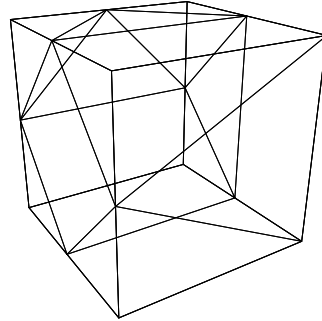
## Pattern 140

### Node index:

8 10 12 13 15 16 18 19

### List of Elements:

Prism 8 0 12 10 3 15  
Tetrahedra 18 19 7 15  
Tetrahedra 16 4 19 12  
Tetrahedra 15 19 12 18  
Tetrahedra 16 19 18 12  
Pyramid 12 8 10 15 18  
Pyramid 8 1 2 10 13  
Tetrahedra 18 8 10 13  
Pyramid 18 10 2 6 13  
Pyramid 16 18 6 5 13  
Pyramid 12 16 13 8 18



Aspect Ratio:  
0.586947

Jacobian Ratio: 1

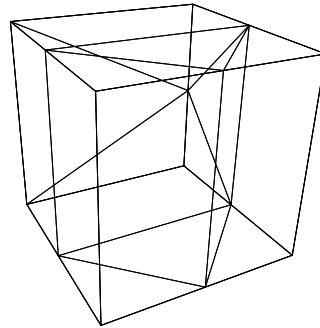
## Pattern 141

### Node index:

8 9 10 15 16 17 18

### List of Elements:

Pyramid 0 8 10 3 15  
Pyramid 0 4 16 8 15  
Pyramid 4 7 18 16 15  
Pyramid 10 8 16 18 15  
Prism 8 1 9 16 5 17  
Prism 8 9 10 16 17 18  
Prism 9 2 10 17 6 18



Aspect Ratio:  
0.557041

Jacobian Ratio: 1

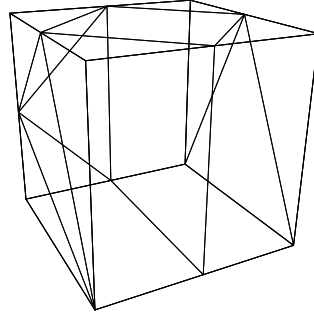
## Pattern 142

### Node index:

9 11 12 16 17 18 19

### List of Elements:

Pyramid 0 1 9 11 12  
Pyramid 19 11 3 7 18  
Pyramid 11 9 2 3 18  
Tetrahedra 18 19 11 9  
Tetrahedra 19 12 11 9  
Tetrahedra 16 4 19 12  
Tetrahedra 19 16 12 9  
Tetrahedra 12 1 9 16  
Pyramid 9 1 5 17 16  
Pyramid 2 9 17 6 18  
Pyramid 19 18 17 16 9



Aspect Ratio:  
0.558543

Jacobian Ratio: 1

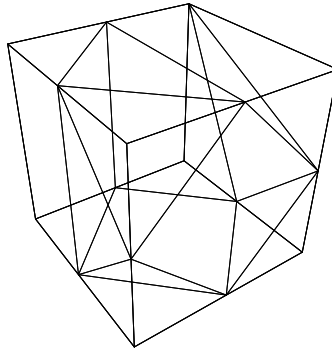
## Pattern 143

### Node index:

8 9 10 11 13 14 16 17 19

### List of Elements:

Prism 11 0 8 19 4 16  
Pyramid 7 19 11 3 10  
Tetrahedra 7 10 14 19  
Tetrahedra 9 2 10 14  
Pyramid 17 19 7 6 14  
Prism 9 8 16 10 11 19  
Pyramid 19 16 9 10 14  
Tetrahedra 17 16 19 14  
Tetrahedra 16 8 9 13  
Tetrahedra 8 1 9 13  
Pyramid 9 13 17 14 16  
Tetrahedra 17 5 16 13



Aspect Ratio:  
0.609416

Jacobian Ratio: 1

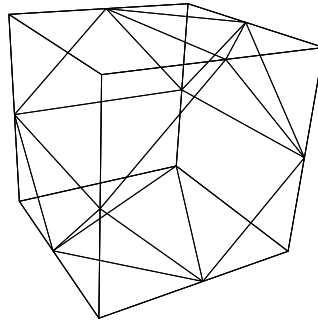
## Pattern 144

### Node index:

8 9 12 13 14 15 17 18 19

### List of Elements:

Pyramid 15 12 0 3 8  
Pyramid 3 2 14 15 9  
Tetrahedra 3 8 9 15  
Tetrahedra 19 7 18 15  
Tetrahedra 17 18 6 14  
Pyramid 19 17 14 15 18  
Tetrahedra 15 19 12 8  
Tetrahedra 14 15 9 8  
Pyramid 15 14 17 19 8  
Pyramid 9 13 17 14 8  
Pyramid 12 19 17 13 8  
Tetrahedra 1 9 8 13  
Prism 19 4 12 17 5 13



Aspect Ratio:  
0.581977

Jacobian Ratio: 1

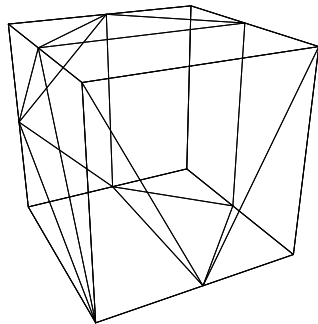
## Pattern 145

### Node index:

9 10 11 12 16 18 19

### List of Elements:

Prism 10 3 11 18 7 19  
Pyramid 18 19 11 10 9  
Pyramid 10 2 6 18 9  
Pyramid 0 1 9 11 12  
Tetrahedra 19 12 11 9  
Tetrahedra 19 16 12 9  
Tetrahedra 16 4 19 12  
Tetrahedra 16 19 18 9  
Tetrahedra 1 12 16 9  
Tetrahedra 1 16 5 9  
Pyramid 6 5 16 18 9



Aspect Ratio:  
0.56148

Jacobian Ratio: 1

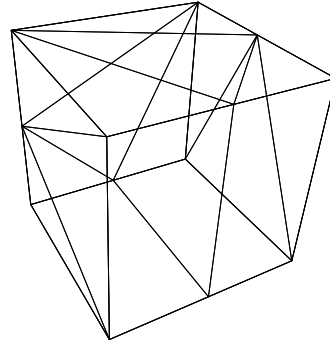
## Pattern 146

### Node index:

9 11 12 17 18

### List of Elements:

Pyramid 0 1 9 11 12  
Tetrahedra 7 4 12 18  
Tetrahedra 7 12 11 18  
Tetrahedra 7 11 3 18  
Pyramid 11 9 2 3 18  
Tetrahedra 9 12 18 11  
Tetrahedra 18 12 9 17  
Tetrahedra 4 17 5 12  
Pyramid 9 1 5 17 12  
Tetrahedra 4 18 17 12  
Pyramid 2 9 17 6 18



Aspect Ratio:  
0.517394

Jacobian Ratio: 1

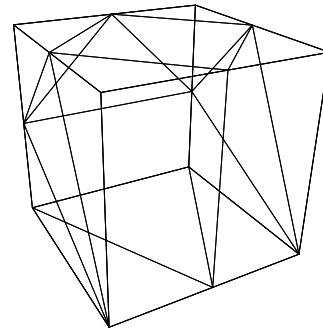
## Pattern 147

### Node index:

9 12 15 16 17 18 19

### List of Elements:

Pyramid 15 12 0 3 9  
Tetrahedra 0 1 9 12  
Tetrahedra 3 9 2 15  
Tetrahedra 15 19 12 9  
Tetrahedra 15 2 18 9  
Tetrahedra 18 19 7 15  
Tetrahedra 9 19 18 15  
Tetrahedra 16 4 19 12  
Tetrahedra 12 9 19 16  
Tetrahedra 1 12 16 9  
Pyramid 19 18 17 16 9  
Pyramid 2 9 17 6 18  
Pyramid 1 5 17 9 16



Aspect Ratio:  
0.55937

Jacobian Ratio: 1

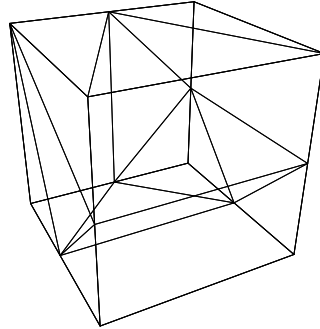
## Pattern 148

### Node index:

8 10 11 13 14 15 19

### List of Elements:

Pyramid 19 4 0 11 8  
Tetrahedra 3 11 10 15  
Pyramid 15 14 6 7 19  
Tetrahedra 11 10 15 19  
Tetrahedra 15 10 14 19  
Tetrahedra 10 11 8 19  
Pyramid 8 13 14 10 19  
Prism 10 2 14 8 1 13  
Tetrahedra 4 13 8 19  
Tetrahedra 4 5 13 19  
Pyramid 14 13 5 6 19



Aspect Ratio:  
0.543173

Jacobian Ratio: 1

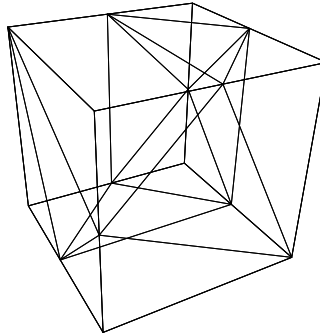
## Pattern 149

### Node index:

8 10 11 13 15 17 18 19

### List of Elements:

Pyramid 0 11 19 4 8  
Tetrahedra 10 3 11 15  
Tetrahedra 18 19 7 15  
Pyramid 10 11 19 18 15  
Pyramid 18 19 11 10 17  
Pyramid 10 2 6 18 17  
Tetrahedra 10 11 8 13  
Tetrahedra 11 13 10 17  
Tetrahedra 11 8 13 19  
Tetrahedra 11 13 17 19  
Tetrahedra 4 13 8 19  
Pyramid 8 1 2 10 13  
Tetrahedra 10 13 2 17  
Pyramid 5 4 19 17 13



Aspect Ratio:  
0.523066

Jacobian Ratio: 1

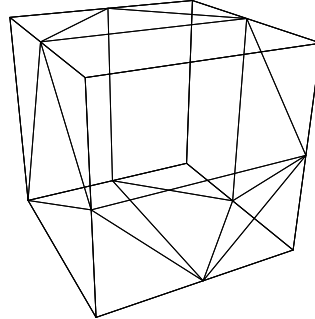
## Pattern 150

### Node index:

9 10 11 13 14 16 18 19

### List of Elements:

Prism 10 3 11 18 7 19  
Pyramid 19 4 0 11 16  
Pyramid 0 1 9 11 13  
Tetrahedra 16 13 0 11  
Pyramid 19 11 10 18 16  
Tetrahedra 9 10 11 13  
Tetrahedra 11 13 10 16  
Pyramid 13 16 18 14 10  
Tetrahedra 9 2 10 14  
Tetrahedra 10 9 14 13  
Prism 16 5 13 18 6 14



Aspect Ratio:  
0.557624

Jacobian Ratio: 1

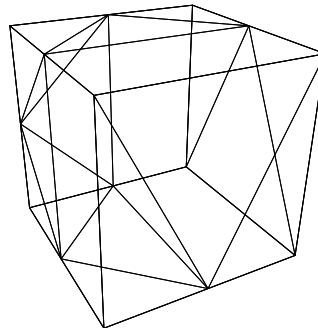
## Pattern 151

### Node index:

8 9 11 12 16 18 19

### List of Elements:

Tetrahedra 11 0 8 12  
Tetrahedra 16 4 19 12  
Pyramid 19 11 3 7 18  
Pyramid 11 9 2 3 18  
Tetrahedra 18 2 6 9  
Tetrahedra 18 19 11 9  
Pyramid 8 16 19 11 12  
Pyramid 19 16 8 11 9  
Tetrahedra 16 19 18 9  
Pyramid 6 5 16 18 9  
Pyramid 1 8 16 5 9



Aspect Ratio:  
0.548909

Jacobian Ratio: 1

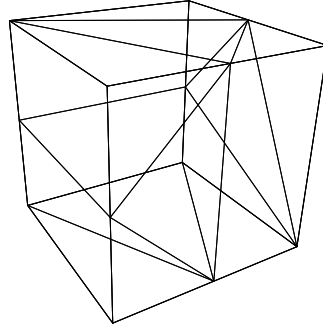
## Pattern 152

### Node index:

9 12 13 15 17 18

### List of Elements:

Tetrahedra 3 9 2 15  
Pyramid 15 12 0 3 9  
Pyramid 0 12 13 1 9  
Tetrahedra 15 2 18 9  
Pyramid 7 4 12 15 18  
Tetrahedra 15 12 9 18  
Tetrahedra 12 9 18 17  
Tetrahedra 18 17 4 12  
Tetrahedra 12 13 9 17  
Pyramid 2 9 17 6 18  
Pyramid 13 12 4 5 17



Aspect Ratio:  
0.55525

Jacobian Ratio: 1

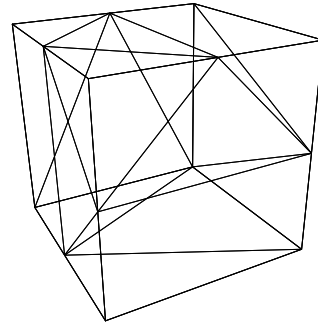
## Pattern 153

### Node index:

8 13 14 16 17 19

### List of Elements:

Tetrahedra 19 3 7 14  
Pyramid 17 19 7 6 14  
Tetrahedra 3 8 2 14  
Tetrahedra 19 0 3 8  
Tetrahedra 8 19 14 3  
Tetrahedra 14 19 8 17  
Pyramid 16 8 0 4 19  
Tetrahedra 17 16 19 8  
Tetrahedra 17 8 14 13  
Tetrahedra 16 13 8 17  
Tetrahedra 16 17 5 13  
Pyramid 1 13 14 2 8



Aspect Ratio:  
0.628867

Jacobian Ratio: 1

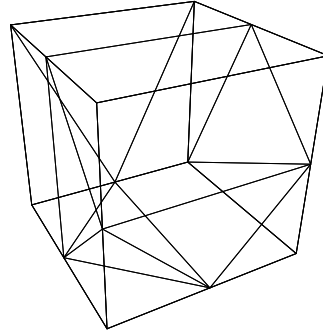
## Pattern 154

### Node index:

8 9 11 13 14 16 18

### List of Elements:

Tetrahedra 7 3 18 11  
Pyramid 18 16 4 7 11  
Pyramid 8 0 4 16 11  
Pyramid 9 2 3 11 14  
Tetrahedra 3 14 18 11  
Tetrahedra 11 8 9 13  
Tetrahedra 16 13 8 11  
Tetrahedra 14 9 13 11  
Tetrahedra 8 1 9 13  
Pyramid 13 16 18 14 11  
Prism 16 5 13 18 6 14



Aspect Ratio:  
0.543173

Jacobian Ratio: 1

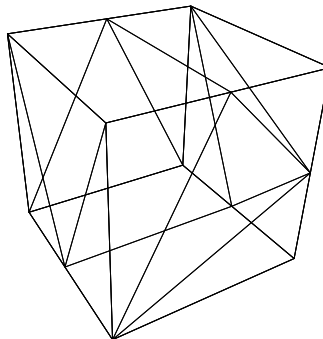
## Pattern 155

### Node index:

8 10 14 17 19

### List of Elements:

Tetrahedra 19 3 7 10  
Pyramid 0 8 10 3 19  
Tetrahedra 4 0 19 8  
Tetrahedra 19 10 7 14  
Pyramid 7 6 17 19 14  
Tetrahedra 19 8 10 14  
Pyramid 1 2 10 8 14  
Tetrahedra 19 14 17 8  
Pyramid 5 4 19 17 8  
Tetrahedra 14 1 17 8  
Tetrahedra 17 1 5 8



Aspect Ratio:  
0.517394

Jacobian Ratio: 1



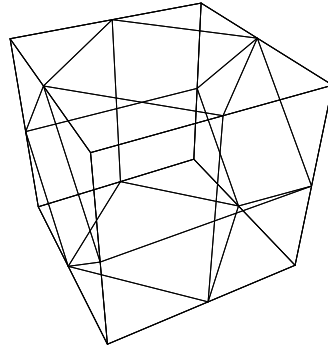
## Pattern 156

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 22  
24

### List of Elements:

Pyramid 24 12 0 11 8  
Pyramid 19 4 12 24 16  
Pyramid 7 19 24 15 18  
Pyramid 15 24 11 3 10  
Pyramid 8 9 10 11 24  
Pyramid 10 14 18 15 24  
Tetrahedra 24 22 10 14  
Tetrahedra 24 9 10 22  
Pyramid 2 9 22 14 10  
Tetrahedra 24 22 14 18  
Tetrahedra 24 22 18 17  
Pyramid 22 17 6 14 18  
Pyramid 19 18 17 16 24  
Tetrahedra 24 8 9 22  
Tetrahedra 24 8 22 13  
Pyramid 9 1 13 22 8  
Tetrahedra 13 22 24 16  
Tetrahedra 24 22 17 16  
Pyramid 22 13 5 17 16  
Pyramid 12 16 13 8 24



Aspect Ratio:  
0.744161

Jacobian Ratio: 1

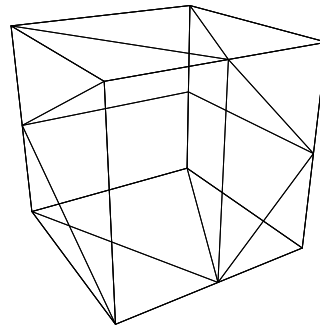
## Pattern 157

### Node index:

9 12 14 15 17

### List of Elements:

Tetrahedra 0 1 9 12  
Pyramid 15 12 0 3 9  
Pyramid 3 2 14 15 9  
Tetrahedra 5 4 17 12  
Pyramid 7 4 12 15 17  
Pyramid 7 15 14 6 17  
Tetrahedra 17 14 9 15  
Tetrahedra 12 9 15 17  
Pyramid 9 1 5 17 12



Aspect Ratio:  
0.542742

Jacobian Ratio: 1

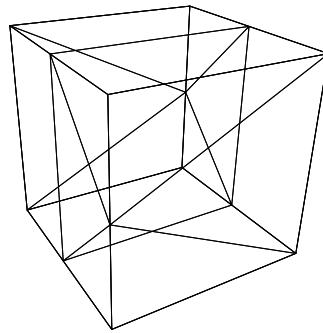
## Pattern 158

### Node index:

8 10 13 15 16 18

### List of Elements:

Pyramid 0 8 10 3 15  
Pyramid 0 4 16 8 15  
Pyramid 4 7 18 16 15  
Pyramid 8 16 18 10 15  
Pyramid 16 8 10 18 13  
Pyramid 1 2 10 8 13  
Pyramid 2 6 18 10 13  
Pyramid 6 5 16 18 13



Aspect Ratio:  
0.548045

Jacobian Ratio: 1

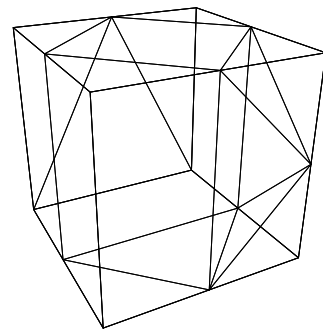
## Pattern 159

### Node index:

8 9 10 14 16 17 18 19

### List of Elements:

Pyramid 7 3 10 18 19  
Pyramid 16 8 0 4 19  
Pyramid 0 8 10 3 19  
Tetrahedra 19 16 8 10  
Pyramid 19 18 17 16 10  
Pyramid 9 8 16 17 10  
Prism 8 1 9 16 5 17  
Tetrahedra 17 10 18 14  
Tetrahedra 10 9 14 17  
Tetrahedra 9 2 10 14  
Tetrahedra 17 18 6 14



Aspect Ratio:  
0.586947

Jacobian Ratio: 1

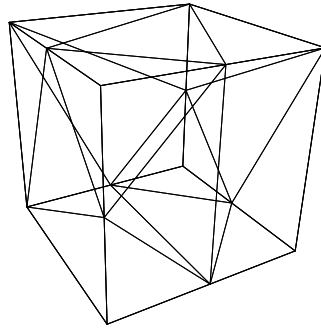
## Pattern 160

### Node index:

9 10 11 13 15 16 17

### List of Elements:

Pyramid 0 1 9 11 13  
Tetrahedra 10 3 11 15  
Tetrahedra 4 0 11 16  
Tetrahedra 4 11 15 16  
Tetrahedra 4 15 7 16  
Tetrahedra 16 7 17 15  
Tetrahedra 17 7 6 15  
Tetrahedra 0 16 13 11  
Tetrahedra 10 6 15 17  
Pyramid 10 11 16 17 15  
Pyramid 17 16 11 10 9  
Tetrahedra 16 13 11 9  
Pyramid 2 9 17 6 10  
Tetrahedra 16 13 9 17  
Tetrahedra 16 17 5 13



Aspect Ratio:  
0.516779

Jacobian Ratio: 1

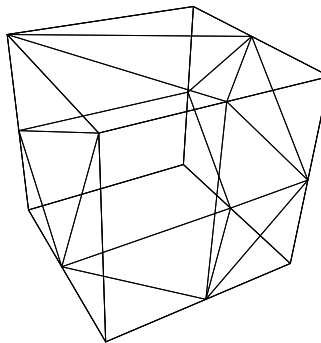
## Pattern 161

### Node index:

8 9 10 12 14 15 17 18

### List of Elements:

Prism 8 0 12 10 3 15  
Pyramid 7 4 12 15 18  
Tetrahedra 12 17 15 18  
Tetrahedra 17 4 18 12  
Tetrahedra 5 4 17 12  
Pyramid 15 10 14 18 17  
Pyramid 12 8 10 15 17  
Tetrahedra 17 18 6 14  
Tetrahedra 9 2 10 14  
Tetrahedra 8 9 10 17  
Tetrahedra 10 9 14 17  
Tetrahedra 12 5 8 17  
Pyramid 9 1 5 17 8



Aspect Ratio:  
0.57575

Jacobian Ratio: 1

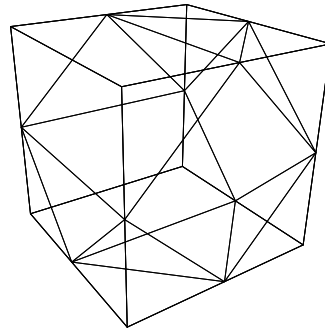
## Pattern 162

### Node index:

8 9 10 12 13 14 15 17 18 19

### List of Elements:

Prism 8 0 12 10 3 15  
Pyramid 15 12 8 10 13  
Tetrahedra 8 9 10 13  
Tetrahedra 1 9 8 13  
Tetrahedra 9 2 10 14  
Tetrahedra 18 19 7 15  
Pyramid 10 14 18 15 17  
Tetrahedra 17 18 6 14  
Tetrahedra 19 18 17 15  
Tetrahedra 15 13 10 17  
Pyramid 12 19 17 13 15  
Prism 13 5 17 12 4 19  
Pyramid 9 13 17 14 10



Aspect Ratio:  
0.670569

Jacobian Ratio: 1

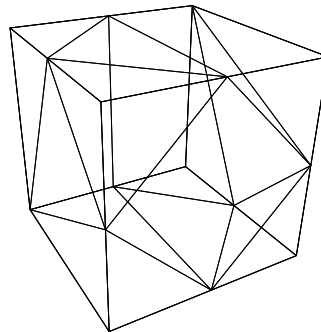
## Pattern 163

### Node index:

9 10 11 13 14 16 17 19

### List of Elements:

Pyramid 0 1 9 11 13  
Tetrahedra 9 2 10 14  
Pyramid 7 19 11 3 10  
Pyramid 19 4 0 11 16  
Tetrahedra 0 16 13 11  
Tetrahedra 7 10 14 19  
Pyramid 7 6 17 19 14  
Tetrahedra 11 14 10 19  
Tetrahedra 9 10 11 14  
Tetrahedra 19 11 14 17  
Pyramid 9 13 17 14 11  
Tetrahedra 17 16 19 11  
Tetrahedra 16 17 13 11  
Tetrahedra 16 17 5 13



Aspect Ratio:  
0.555983

Jacobian Ratio: 1

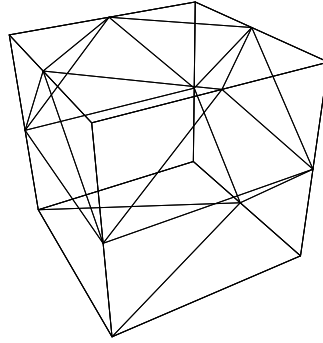
## Pattern 164

### Node index:

10 12 13 14 15 16 17 18 19

### List of Elements:

Pyramid 15 12 0 3 10  
Pyramid 0 12 13 1 10  
Tetrahedra 13 12 15 10  
Pyramid 15 10 14 18 13  
Pyramid 2 1 13 14 10  
Tetrahedra 18 19 7 15  
Tetrahedra 18 19 15 13  
Tetrahedra 15 19 12 13  
Tetrahedra 16 4 19 12  
Tetrahedra 19 16 12 13  
Tetrahedra 18 13 14 17  
Tetrahedra 17 18 6 14  
Tetrahedra 16 17 5 13  
Pyramid 19 18 17 16 13



Aspect Ratio:  
0.632675

Jacobian Ratio: 1

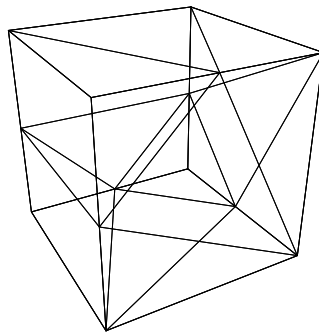
## Pattern 165

### Node index:

10 11 12 13 15 17

### List of Elements:

Pyramid 0 12 13 1 11  
Tetrahedra 11 1 10 13  
Tetrahedra 10 1 2 13  
Tetrahedra 10 3 11 15  
Tetrahedra 10 15 11 13  
Tetrahedra 12 11 15 13  
Tetrahedra 17 7 6 15  
Pyramid 7 4 12 15 17  
Tetrahedra 10 6 15 17  
Tetrahedra 15 13 10 17  
Tetrahedra 12 13 15 17  
Pyramid 13 12 4 5 17  
Tetrahedra 2 6 10 17  
Tetrahedra 2 13 17 10



Aspect Ratio:  
0.515826

Jacobian Ratio: 1

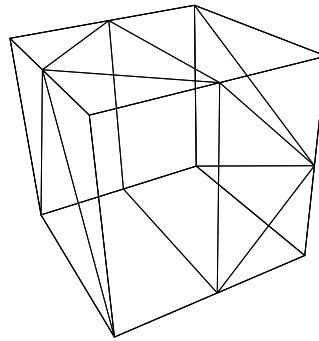
## Pattern 166

### Node index:

9 11 14 16 17 19

### List of Elements:

Pyramid 4 0 11 19 16  
Pyramid 2 3 11 9 14  
Pyramid 3 7 19 11 14  
Pyramid 17 19 7 6 14  
Pyramid 9 11 19 17 14  
Pyramid 19 11 9 17 16  
Pyramid 0 1 9 11 16  
Pyramid 1 5 17 9 16



Aspect Ratio:  
0.548045

Jacobian Ratio: 1

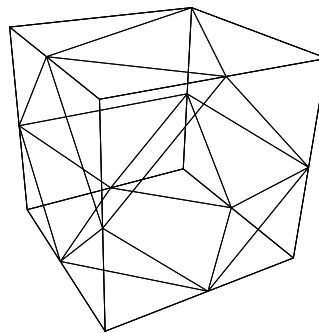
## Pattern 167

### Node index:

8 9 10 11 12 13 14 15 16 17

### List of Elements:

Tetrahedra 10 3 11 15  
Tetrahedra 0 8 11 12  
Pyramid 8 9 10 11 15  
Tetrahedra 9 2 10 14  
Tetrahedra 15 10 14 9  
Tetrahedra 12 8 11 15  
Tetrahedra 8 1 9 13  
Tetrahedra 8 13 9 15  
Pyramid 7 4 12 15 16  
Pyramid 15 14 6 7 17  
Tetrahedra 17 16 7 15  
Pyramid 12 16 13 8 15  
Pyramid 13 17 14 9 15  
Tetrahedra 13 16 17 15  
Tetrahedra 17 16 13 5



Aspect Ratio:  
0.651127

Jacobian Ratio: 1

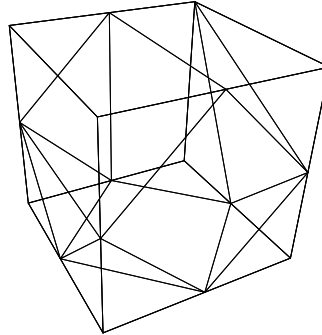
## Pattern 168

### Node index:

8 9 10 11 12 13 14 17 19

### List of Elements:

Pyramid 3 7 19 11 10  
Tetrahedra 11 0 8 12  
Tetrahedra 7 10 14 19  
Pyramid 7 6 17 19 14  
Tetrahedra 9 2 10 14  
Tetrahedra 19 11 10 12  
Pyramid 8 9 10 11 12  
Tetrahedra 13 8 12 9  
Tetrahedra 8 1 9 13  
Pyramid 14 9 12 19 10  
Prism 12 13 9 19 17 14  
Prism 19 4 12 17 5 13



Aspect Ratio:  
0.612786

Jacobian Ratio: 1

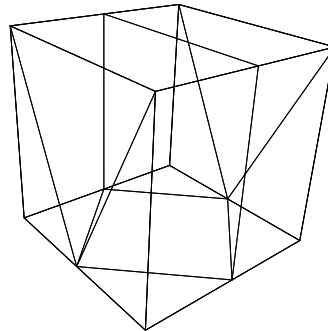
## Pattern 169

### Node index:

8 9 10 11 17 19

### List of Elements:

Pyramid 4 0 11 19 8  
Pyramid 3 7 19 11 10  
Pyramid 8 9 10 11 19  
Pyramid 17 19 7 6 10  
Tetrahedra 19 9 10 17  
Tetrahedra 19 9 17 8  
Pyramid 2 9 17 6 10  
Pyramid 9 1 5 17 8  
Pyramid 5 4 19 17 8



Aspect Ratio:  
0.512638

Jacobian Ratio: 1

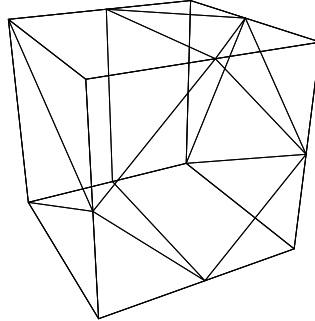
## Pattern 170

### Node index:

9 11 13 14 17 18 19

### List of Elements:

Pyramid 0 1 9 11 13  
Pyramid 11 9 2 3 14  
Pyramid 4 0 11 19 13  
Pyramid 19 11 3 7 18  
Tetrahedra 3 14 18 11  
Tetrahedra 19 18 17 11  
Tetrahedra 11 14 18 17  
Tetrahedra 19 11 17 13  
Pyramid 13 17 14 9 11  
Tetrahedra 17 18 6 14  
Pyramid 5 4 19 17 13



Aspect Ratio:  
0.558543

Jacobian Ratio: 1

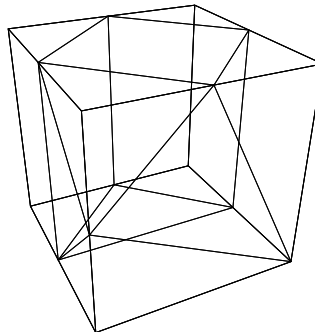
## Pattern 171

### Node index:

8 10 11 13 16 17 18 19

### List of Elements:

Prism 11 0 8 19 4 16  
Prism 10 3 11 18 7 19  
Tetrahedra 10 11 8 13  
Pyramid 18 19 11 10 13  
Pyramid 19 16 8 11 13  
Tetrahedra 18 13 10 17  
Pyramid 19 18 17 16 13  
Tetrahedra 16 17 5 13  
Pyramid 1 2 10 8 13  
Pyramid 10 2 6 18 17  
Tetrahedra 17 2 13 10



Aspect Ratio:  
0.56125

Jacobian Ratio: 1



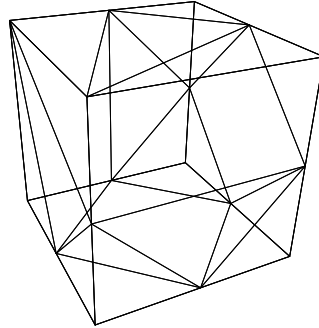
## Pattern 172

### Node index:

8 9 10 11 13 14 15 18 19

### List of Elements:

Pyramid 19 4 0 11 8  
Pyramid 8 9 10 11 13  
Tetrahedra 19 8 11 13  
Tetrahedra 8 1 9 13  
Tetrahedra 8 4 13 19  
Tetrahedra 19 5 4 13  
Tetrahedra 10 3 11 15  
Tetrahedra 18 19 7 15  
Tetrahedra 11 10 15 13  
Tetrahedra 11 15 19 13  
Tetrahedra 13 19 18 15  
Pyramid 15 10 14 18 13  
Tetrahedra 5 19 18 13  
Tetrahedra 9 2 10 14  
Tetrahedra 14 9 13 10  
Pyramid 14 13 5 6 18



Aspect Ratio:  
0.59977

Jacobian Ratio: 1

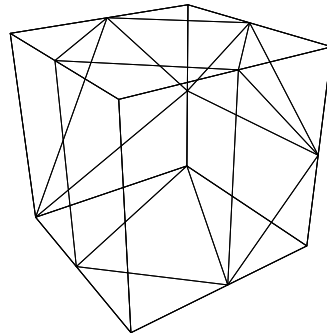
## Pattern 173

### Node index:

8 9 14 15 16 17 18 19

### List of Elements:

Tetrahedra 3 0 8 15  
Tetrahedra 3 8 9 15  
Pyramid 3 2 14 15 9  
Tetrahedra 15 19 0 8  
Pyramid 8 0 4 16 19  
Tetrahedra 18 19 7 15  
Tetrahedra 15 9 14 18  
Tetrahedra 18 9 14 17  
Tetrahedra 17 18 6 14  
Pyramid 9 8 19 18 15  
Prism 19 16 8 18 17 9  
Prism 8 1 9 16 5 17



Aspect Ratio:  
0.552356

Jacobian Ratio: 1

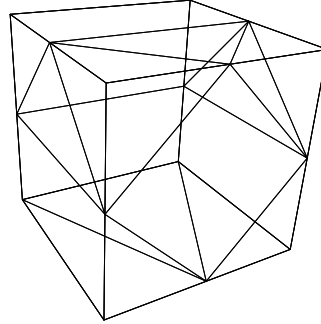
## Pattern 174

### Node index:

9 12 13 14 15 16 17 18

### List of Elements:

Pyramid 3 2 14 15 9  
Pyramid 15 12 0 3 9  
Pyramid 0 12 13 1 9  
Tetrahedra 13 12 15 9  
Tetrahedra 14 18 15 9  
Tetrahedra 15 13 9 18  
Pyramid 9 13 17 14 18  
Tetrahedra 17 18 6 14  
Prism 18 7 15 16 4 12  
Pyramid 18 16 12 15 13  
Tetrahedra 18 17 16 13  
Tetrahedra 16 17 5 13



Aspect Ratio:  
0.583721

Jacobian Ratio: 1

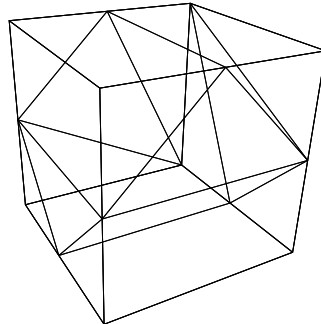
## Pattern 175

### Node index:

8 10 12 13 14 17 19

### List of Elements:

Pyramid 0 8 10 3 12  
Tetrahedra 19 3 7 10  
Tetrahedra 12 3 19 10  
Tetrahedra 7 10 14 19  
Pyramid 17 19 7 6 14  
Tetrahedra 12 10 19 14  
Pyramid 10 8 13 14 12  
Prism 10 2 14 8 1 13  
Pyramid 19 17 13 12 14  
Prism 19 4 12 17 5 13



Aspect Ratio:  
0.53192

Jacobian Ratio: 1

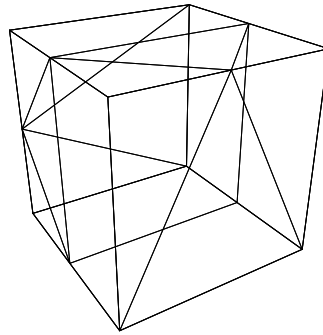
## Pattern 176

### Node index:

8 10 12 16 17 18

### List of Elements:

Pyramid 0 8 10 3 12  
Pyramid 7 3 10 18 12  
Pyramid 4 7 18 16 12  
Pyramid 8 16 18 10 12  
Pyramid 8 10 18 16 17  
Pyramid 1 2 10 8 17  
Pyramid 1 8 16 5 17  
Pyramid 10 2 6 18 17



Aspect Ratio:  
0.548045

Jacobian Ratio: 1

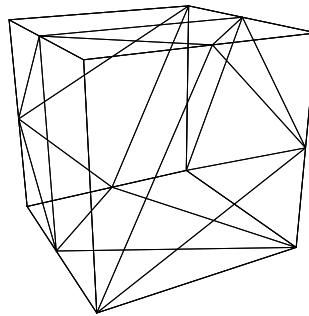
## Pattern 177

### Node index:

8 11 12 14 16 17 18

### List of Elements:

Tetrahedra 11 2 3 14  
Tetrahedra 8 2 11 14  
Tetrahedra 1 2 8 14  
Tetrahedra 7 3 18 11  
Tetrahedra 18 3 14 11  
Tetrahedra 7 12 11 18  
Pyramid 18 16 4 7 12  
Tetrahedra 11 0 8 12  
Pyramid 18 14 8 12 11  
Pyramid 12 8 14 18 17  
Tetrahedra 12 17 18 16  
Tetrahedra 8 12 16 17  
Tetrahedra 8 1 14 17  
Pyramid 1 8 16 5 17  
Tetrahedra 17 18 6 14



Aspect Ratio:  
0.513302

Jacobian Ratio: 1

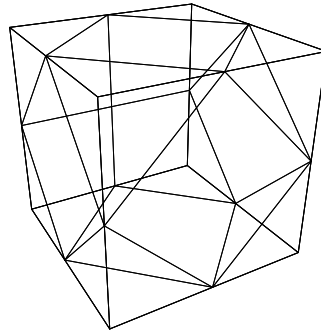
## Pattern 178

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 24

### List of Elements:

Pyramid 0 11 24 12 8  
Pyramid 11 3 15 24 10  
Pyramid 24 15 7 19 18  
Pyramid 12 24 19 4 16  
Pyramid 8 9 10 11 24  
Pyramid 10 14 18 15 24  
Tetrahedra 8 1 9 13  
Tetrahedra 8 13 9 24  
Tetrahedra 9 2 10 14  
Tetrahedra 9 14 10 24  
Tetrahedra 17 18 6 14  
Tetrahedra 14 17 18 24  
Tetrahedra 13 16 17 24  
Tetrahedra 17 16 13 5  
Pyramid 12 16 13 8 24  
Pyramid 9 13 17 14 24  
Pyramid 19 18 17 16 24



Aspect Ratio:  
0.827007

Jacobian Ratio: 1

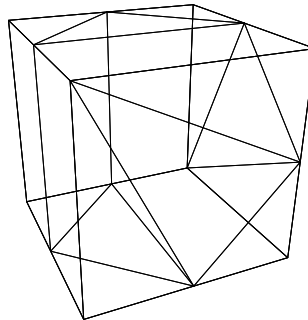
## Pattern 179

### Node index:

8 9 11 14 16 18 19

### List of Elements:

Prism 11 0 8 19 4 16  
Pyramid 19 11 3 7 18  
Pyramid 11 9 2 3 14  
Tetrahedra 3 14 18 11  
Tetrahedra 11 14 18 19  
Tetrahedra 11 9 14 19  
Pyramid 19 16 8 11 9  
Tetrahedra 19 9 14 16  
Tetrahedra 16 19 18 14  
Pyramid 1 8 16 5 9  
Tetrahedra 16 9 14 5  
Pyramid 6 5 16 18 14



Aspect Ratio:  
0.494248

Jacobian Ratio: 1

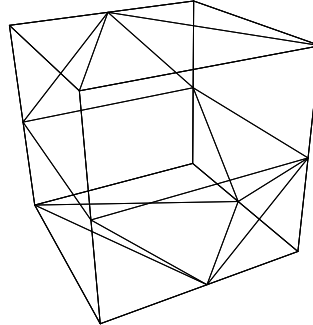
## Pattern 180

### Node index:

9 10 12 13 14 15 19

### List of Elements:

Pyramid 15 12 0 3 10  
Tetrahedra 0 9 10 12  
Pyramid 1 0 12 13 9  
Tetrahedra 12 9 10 15  
Tetrahedra 9 2 10 14  
Tetrahedra 15 10 14 9  
Pyramid 15 14 13 12 9  
Pyramid 13 12 4 5 19  
Pyramid 14 13 5 6 19  
Pyramid 15 14 6 7 19  
Pyramid 12 13 14 15 19



Aspect Ratio:  
0.547649

Jacobian Ratio: 1

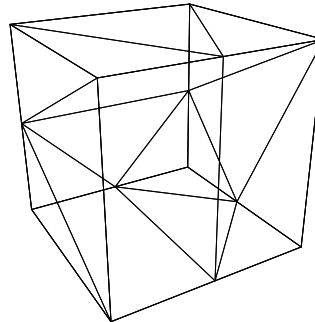
## Pattern 181

### Node index:

9 10 11 12 15 17

### List of Elements:

Pyramid 0 1 9 11 12  
Tetrahedra 10 3 11 15  
Tetrahedra 9 10 11 15  
Tetrahedra 12 11 15 9  
Tetrahedra 17 7 6 15  
Tetrahedra 17 15 6 10  
Tetrahedra 15 9 10 17  
Pyramid 2 9 17 6 10  
Pyramid 7 4 12 15 17  
Tetrahedra 12 9 15 17  
Tetrahedra 17 5 4 12  
Pyramid 1 5 17 9 12



Aspect Ratio:  
0.543705

Jacobian Ratio: 1

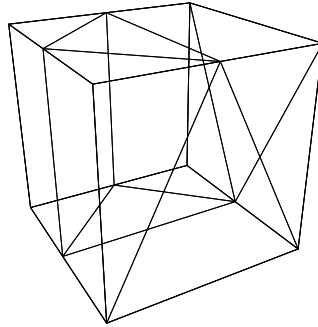
## Pattern 182

### Node index:

8 10 11 16 17 19

### List of Elements:

Prism 11 0 8 19 4 16  
Pyramid 19 11 3 7 10  
Pyramid 19 16 8 11 10  
Pyramid 17 19 7 6 10  
Tetrahedra 17 16 19 10  
Tetrahedra 16 8 10 17  
Tetrahedra 2 6 10 17  
Pyramid 1 2 10 8 17  
Pyramid 5 1 8 16 17



Aspect Ratio:  
0.516227

Jacobian Ratio: 1

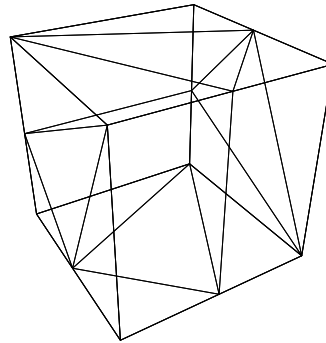
## Pattern 183

### Node index:

8 9 12 15 17 18

### List of Elements:

Pyramid 0 3 15 12 8  
Tetrahedra 3 8 9 15  
Tetrahedra 3 9 2 15  
Pyramid 7 4 12 15 18  
Tetrahedra 15 9 2 18  
Tetrahedra 12 17 15 18  
Tetrahedra 15 9 18 17  
Tetrahedra 15 8 9 17  
Tetrahedra 15 12 8 17  
Pyramid 2 9 17 6 18  
Tetrahedra 17 4 18 12  
Tetrahedra 5 4 17 12  
Tetrahedra 12 5 8 17  
Pyramid 9 1 5 17 8



Aspect Ratio:  
0.495869

Jacobian Ratio: 1

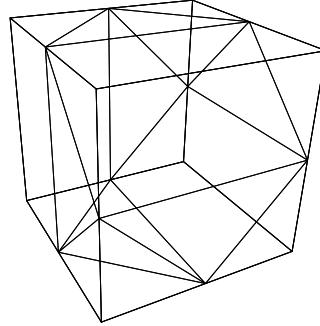
## Pattern 184

### Node index:

8 9 11 13 14 15 16 18 19

### List of Elements:

Prism 11 0 8 19 4 16  
Prism 11 3 15 9 2 14  
Tetrahedra 11 8 9 13  
Tetrahedra 8 1 9 13  
Pyramid 11 9 14 15 13  
Tetrahedra 11 15 19 13  
Pyramid 19 16 8 11 13  
Tetrahedra 18 19 7 15  
Tetrahedra 14 18 15 19  
Tetrahedra 15 13 14 19  
Pyramid 13 16 18 14 19  
Prism 14 6 18 13 5 16



Aspect Ratio:  
0.609483

Jacobian Ratio: 1

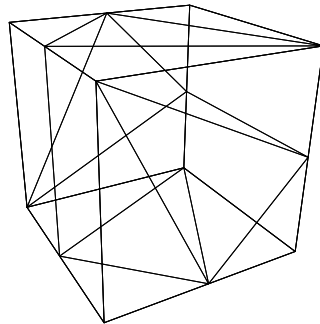
## Pattern 185

### Node index:

8 9 14 15 16 19

### List of Elements:

Tetrahedra 3 0 8 15  
Tetrahedra 3 8 9 15  
Pyramid 3 2 14 15 9  
Pyramid 15 14 6 7 19  
Tetrahedra 15 0 8 19  
Pyramid 16 8 0 4 19  
Tetrahedra 15 8 9 19  
Tetrahedra 15 9 14 19  
Tetrahedra 19 8 9 16  
Tetrahedra 19 9 14 16  
Tetrahedra 16 14 19 6  
Tetrahedra 5 14 16 6  
Tetrahedra 5 9 16 14  
Pyramid 5 1 8 16 9



Aspect Ratio:  
0.495097

Jacobian Ratio: 1

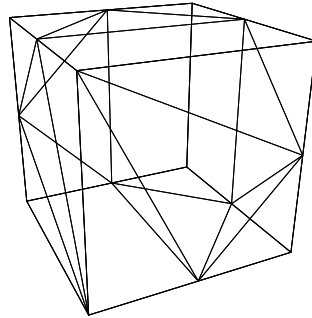
## Pattern 186

### Node index:

9 10 11 12 14 16 18 19

### List of Elements:

Pyramid 0 1 9 11 12  
Prism 10 3 11 18 7 19  
Tetrahedra 16 4 19 12  
Tetrahedra 19 12 11 16  
Pyramid 19 11 10 18 16  
Tetrahedra 9 10 11 16  
Tetrahedra 12 9 11 16  
Tetrahedra 12 1 9 16  
Tetrahedra 10 14 18 16  
Tetrahedra 9 2 10 14  
Tetrahedra 9 14 10 16  
Pyramid 16 18 6 5 14  
Tetrahedra 16 9 14 5  
Tetrahedra 16 1 9 5



Aspect Ratio:  
0.558291

Jacobian Ratio: 1

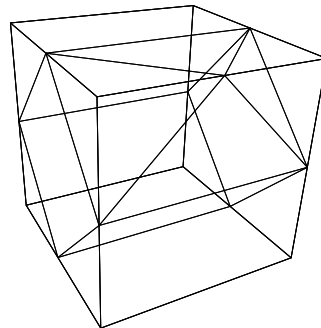
## Pattern 187

### Node index:

8 10 12 13 14 15 16 17 18

### List of Elements:

Prism 18 7 15 16 4 12  
Prism 15 3 10 12 0 8  
Prism 10 2 14 8 1 13  
Hexaedra 15 10 14 18 12 8 13 16  
Pyramid 16 13 14 18 17  
Tetrahedra 16 17 5 13  
Tetrahedra 17 18 6 14



Aspect Ratio:  
0.58558

Jacobian Ratio: 1



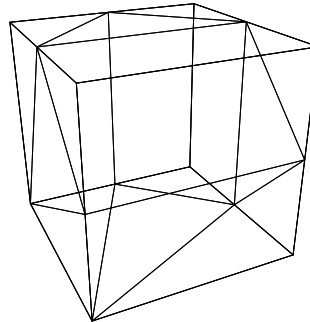
## Pattern 188

### Node index:

10 11 13 14 16 18 19

### List of Elements:

Prism 10 3 11 18 7 19  
Pyramid 19 4 0 11 16  
Tetrahedra 0 1 11 13  
Tetrahedra 0 13 11 16  
Pyramid 11 10 18 19 16  
Tetrahedra 11 1 10 13  
Tetrahedra 11 13 10 16  
Pyramid 13 16 18 14 10  
Pyramid 1 13 14 2 10  
Prism 14 6 18 13 5 16



Aspect Ratio:  
0.53192

Jacobian Ratio: 1

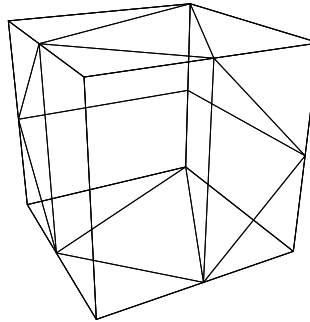
## Pattern 189

### Node index:

8 9 12 14 15 16 17

### List of Elements:

Pyramid 15 12 0 3 8  
Tetrahedra 3 8 9 15  
Pyramid 3 2 14 15 9  
Pyramid 4 12 15 7 16  
Tetrahedra 15 16 17 7  
Pyramid 15 14 6 7 17  
Tetrahedra 8 12 16 15  
Tetrahedra 17 14 9 15  
Pyramid 9 8 16 17 15  
Prism 8 1 9 16 5 17



Aspect Ratio:  
0.557666

Jacobian Ratio: 1

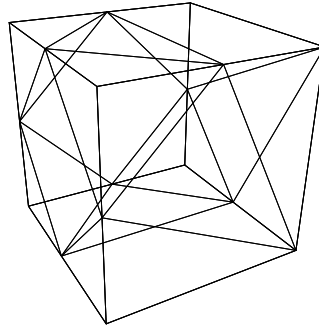
## Pattern 190

### Node index:

8 10 11 12 13 15 16 17 19

### List of Elements:

Tetrahedra 10 3 11 15  
Tetrahedra 11 0 8 12  
Pyramid 7 6 17 19 15  
Tetrahedra 10 6 15 17  
Tetrahedra 2 6 10 17  
Tetrahedra 15 11 10 17  
Tetrahedra 10 11 8 17  
Tetrahedra 17 8 10 13  
Pyramid 8 1 2 10 13  
Tetrahedra 13 2 10 17  
Pyramid 19 12 11 15 17  
Tetrahedra 8 12 17 11  
Tetrahedra 12 17 19 16  
Tetrahedra 16 4 19 12  
Tetrahedra 16 17 5 13  
Pyramid 16 13 8 12 17



Aspect Ratio:  
0.59977

Jacobian Ratio: 1

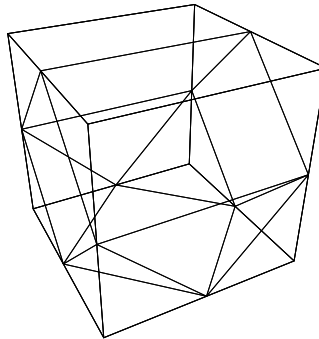
## Pattern 191

### Node index:

8 10 12 13 14 15 16 17 18 19

### List of Elements:

Prism 15 3 10 12 0 8  
Pyramid 12 8 10 15 19  
Tetrahedra 18 19 7 15  
Pyramid 10 14 18 15 19  
Pyramid 10 8 13 14 19  
Tetrahedra 16 4 19 12  
Pyramid 16 13 8 12 19  
Prism 10 2 14 8 1 13  
Tetrahedra 19 16 13 14  
Pyramid 19 18 17 16 14  
Tetrahedra 17 18 6 14  
Tetrahedra 16 13 14 17  
Tetrahedra 16 17 5 13



Aspect Ratio:  
0.673637

Jacobian Ratio: 1

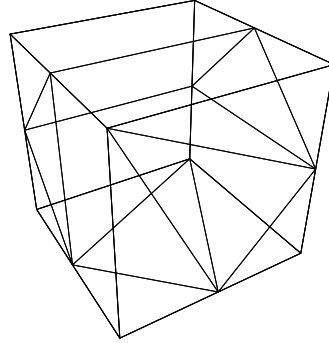
## Pattern 192

**Node index:**

8 9 12 14 15 16 18

**List of Elements:**

Pyramid 15 12 0 3 8  
Tetrahedra 3 8 9 15  
Pyramid 3 2 14 15 9  
Prism 18 7 15 16 4 12  
Tetrahedra 14 18 15 9  
Tetrahedra 15 8 9 18  
Pyramid 16 12 15 18 8  
Tetrahedra 8 9 18 16  
Tetrahedra 16 9 18 14  
Pyramid 8 16 5 1 9  
Tetrahedra 16 9 14 5  
Pyramid 6 5 16 18 14



Aspect Ratio:  
0.494248

Jacobian Ratio: 1

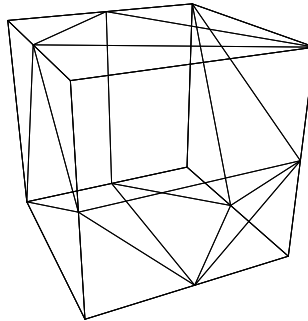
## Pattern 193

**Node index:**

9 10 11 13 14 16 19

**List of Elements:**

Pyramid 0 1 9 11 13  
Pyramid 19 11 3 7 10  
Tetrahedra 7 10 14 19  
Tetrahedra 7 14 6 19  
Pyramid 11 19 4 0 16  
Tetrahedra 13 0 16 11  
Tetrahedra 16 13 11 19  
Tetrahedra 9 10 11 19  
Tetrahedra 11 13 9 19  
Tetrahedra 9 2 10 14  
Tetrahedra 9 14 10 19  
Tetrahedra 13 14 9 19  
Tetrahedra 13 14 19 16  
Tetrahedra 19 6 16 14  
Pyramid 14 13 5 6 16



Aspect Ratio:  
0.507545

Jacobian Ratio: 1

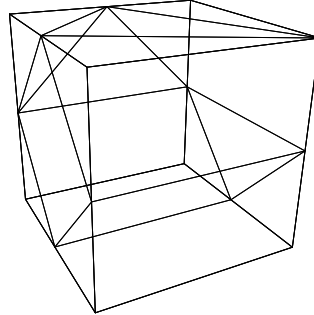
## Pattern 194

### Node index:

8 10 12 13 14 15 16 19

### List of Elements:

Prism 15 3 10 12 0 8  
Pyramid 12 8 10 15 19  
Tetrahedra 16 4 19 12  
Pyramid 15 14 6 7 19  
Tetrahedra 15 10 14 19  
Pyramid 8 13 14 10 19  
Prism 10 2 14 8 1 13  
Pyramid 16 13 8 12 19  
Tetrahedra 19 13 14 16  
Tetrahedra 19 6 16 14  
Pyramid 14 13 5 6 16



Aspect Ratio:  
0.56125

Jacobian Ratio: 1

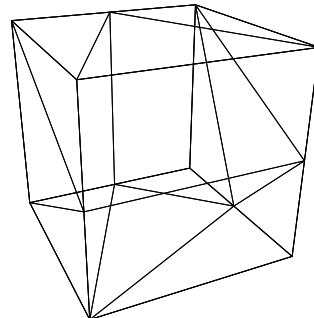
## Pattern 195

### Node index:

10 11 13 14 19

### List of Elements:

Tetrahedra 0 1 11 13  
Tetrahedra 11 1 10 13  
Pyramid 4 0 11 19 13  
Pyramid 19 11 3 7 10  
Tetrahedra 11 13 10 19  
Tetrahedra 7 6 19 14  
Tetrahedra 7 10 14 19  
Tetrahedra 13 14 10 19  
Pyramid 2 1 13 14 10  
Tetrahedra 5 4 19 13  
Pyramid 14 13 5 6 19



Aspect Ratio:  
0.517394

Jacobian Ratio: 1

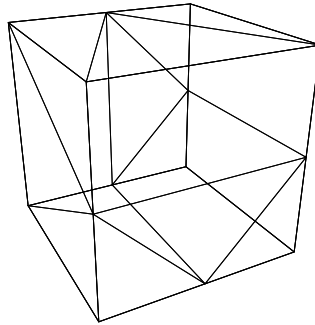
## Pattern 196

### Node index:

9 11 13 14 15 19

### List of Elements:

Pyramid 0 1 9 11 13  
Pyramid 4 0 11 19 13  
Tetrahedra 19 5 4 13  
Prism 11 3 15 9 2 14  
Pyramid 15 14 6 7 19  
Pyramid 11 9 14 15 19  
Tetrahedra 11 13 9 19  
Tetrahedra 13 14 9 19  
Pyramid 14 13 5 6 19



Aspect Ratio:  
0.516227

Jacobian Ratio: 1

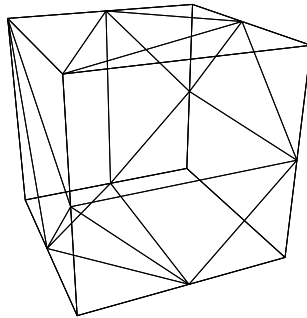
## Pattern 197

### Node index:

8 9 11 13 14 15 18 19

### List of Elements:

Pyramid 4 0 11 19 8  
Prism 11 3 15 9 2 14  
Tetrahedra 18 19 7 15  
Tetrahedra 14 18 15 19  
Pyramid 11 9 14 15 19  
Tetrahedra 11 8 9 19  
Tetrahedra 19 8 9 13  
Tetrahedra 8 1 9 13  
Tetrahedra 4 13 8 19  
Tetrahedra 13 14 9 19  
Tetrahedra 19 5 4 13  
Tetrahedra 19 13 14 18  
Tetrahedra 5 19 18 13  
Pyramid 14 13 5 6 18



Aspect Ratio:  
0.558291

Jacobian Ratio: 1

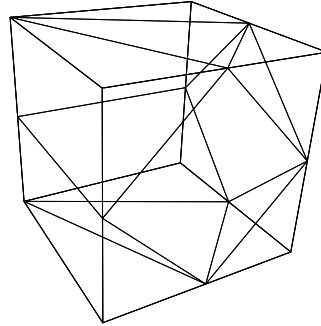
## Pattern 198

### Node index:

9 10 12 13 14 15 17 18

### List of Elements:

Pyramid 15 12 0 3 10  
Tetrahedra 0 9 10 12  
Pyramid 1 0 12 13 9  
Tetrahedra 9 2 10 14  
Pyramid 7 4 12 15 18  
Pyramid 10 14 18 15 12  
Tetrahedra 12 9 10 14  
Tetrahedra 12 14 18 17  
Tetrahedra 17 4 18 12  
Tetrahedra 17 18 6 14  
Pyramid 4 5 13 12 17  
Pyramid 13 17 14 9 12



Aspect Ratio:  
0.587786

Jacobian Ratio: 1

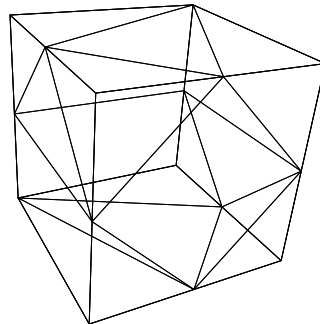
## Pattern 199

### Node index:

9 10 12 13 14 15 16 17

### List of Elements:

Pyramid 15 12 0 3 10  
Tetrahedra 9 2 10 14  
Tetrahedra 0 9 10 12  
Pyramid 12 13 1 0 9  
Tetrahedra 12 9 10 15  
Tetrahedra 15 10 14 9  
Pyramid 15 14 6 7 17  
Pyramid 7 4 12 15 16  
Tetrahedra 16 7 17 15  
Tetrahedra 12 13 9 15  
Pyramid 9 13 17 14 15  
Tetrahedra 12 16 13 15  
Tetrahedra 13 16 17 15  
Tetrahedra 16 17 5 13



Aspect Ratio:  
0.555983

Jacobian Ratio: 1

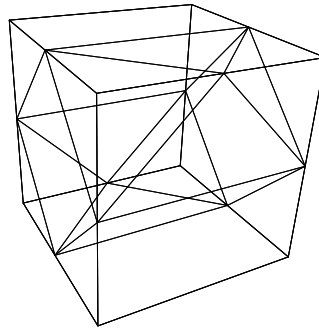
## Pattern 200

### Node index:

8 10 11 12 13 14 15 16 17 18

### List of Elements:

Tetrahedra 11 0 8 12  
Tetrahedra 10 3 11 15  
Pyramid 8 12 15 10 11  
Prism 18 7 15 16 4 12  
Hexaedra 15 10 14 18 12 8 13 16  
Tetrahedra 16 17 5 13  
Tetrahedra 17 18 6 14  
Pyramid 18 16 13 14 17  
Prism 10 2 14 8 1 13



Aspect Ratio:  
0.610113

Jacobian Ratio: 1

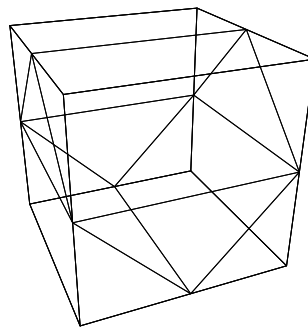
## Pattern 201

### Node index:

9 11 12 13 14 15 16 18

### List of Elements:

Prism 12 0 11 13 1 9  
Prism 11 3 15 9 2 14  
Prism 14 9 13 15 11 12  
Prism 18 7 15 16 4 12  
Prism 14 18 15 13 16 12  
Prism 16 5 13 18 6 14



Aspect Ratio:  
0.569036

Jacobian Ratio: 1

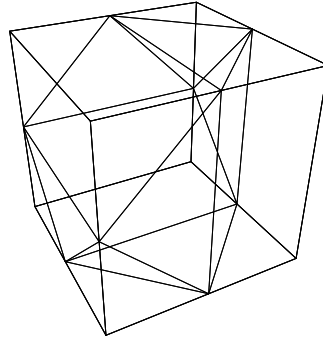
## Pattern 202

### Node index:

8 9 10 12 13 15 17 18 19

### List of Elements:

Prism 15 3 10 12 0 8  
Pyramid 12 8 10 15 19  
Tetrahedra 8 9 10 19  
Tetrahedra 18 19 7 15  
Tetrahedra 18 15 10 19  
Pyramid 10 9 17 18 19  
Prism 9 2 10 17 6 18  
Tetrahedra 19 8 9 17  
Tetrahedra 8 1 9 13  
Tetrahedra 8 13 9 17  
Pyramid 12 19 17 13 8  
Prism 13 5 17 12 4 19



Aspect Ratio:  
0.609483

Jacobian Ratio: 1

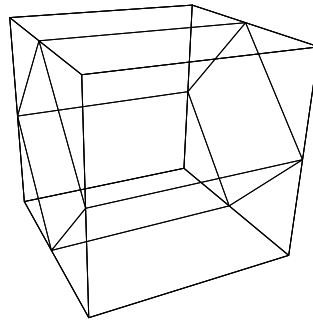
## Pattern 203

### Node index:

8 10 12 13 14 15 16 18

### List of Elements:

Prism 18 7 15 16 4 12  
Prism 14 6 18 13 5 16  
Prism 10 2 14 8 1 13  
Prism 15 3 10 12 0 8  
Hexaedra 10 14 18 15 8 13 16 12



Aspect Ratio:  
0.541421

Jacobian Ratio: 1



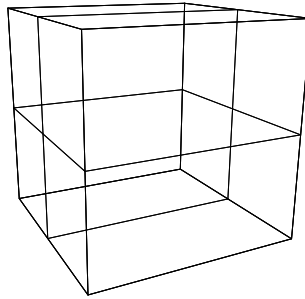
## Pattern 204

### Node index:

8 10 12 13 14 15 16 18 21 23

### List of Elements:

Hexaedra 23 10 2 14 21 8 1 13  
Hexaedra 15 3 10 23 12 0 8 21  
Hexaedra 18 23 14 6 16 21 13 5  
Hexaedra 7 15 23 18 4 12 21 16



Aspect Ratio:  
0.5

Jacobian Ratio: 1

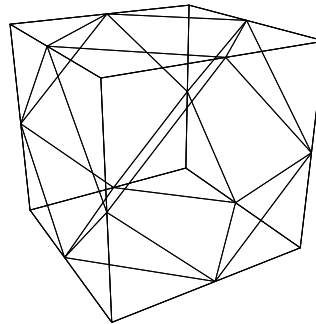
## Pattern 205

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19

### List of Elements:

Tetrahedra 11 0 8 12  
Tetrahedra 10 3 11 15  
Tetrahedra 9 2 10 14  
Tetrahedra 18 19 7 15  
Tetrahedra 16 4 19 12  
Pyramid 8 9 10 11 15  
Pyramid 12 11 15 19 8  
Pyramid 10 14 18 15 9  
Pyramid 9 8 19 18 15  
Pyramid 18 19 8 9 13  
Tetrahedra 8 1 9 13  
Pyramid 12 16 13 8 19  
Pyramid 13 17 14 9 18  
Tetrahedra 17 18 6 14  
Pyramid 19 18 17 16 13  
Tetrahedra 16 17 5 13



Aspect Ratio:  
0.762955

Jacobian Ratio: 1

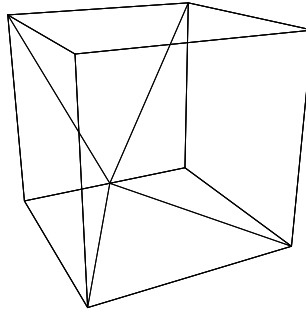
## Pattern 206

**Node index:**

11

**List of Elements:**

Pyramid 4 5 1 0 11  
Pyramid 5 6 2 1 11  
Pyramid 6 7 3 2 11  
Pyramid 4 7 6 5 11



Aspect Ratio:  
0.880226

Jacobian Ratio: 1

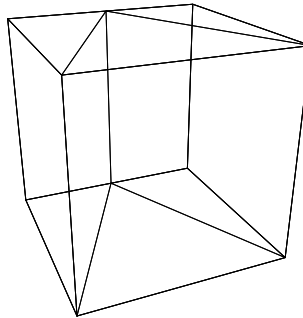
## Pattern 207

**Node index:**

11 19

**List of Elements:**

Prism 0 1 11 4 5 19  
Prism 1 2 11 5 6 19  
Prism 2 3 11 6 7 19



Aspect Ratio:  
0.804738

Jacobian Ratio: 1

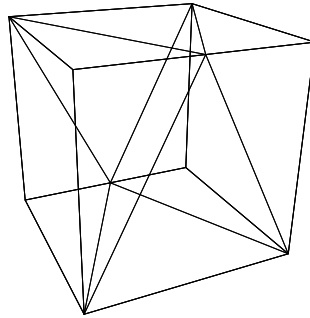
## Pattern 208

### Node index:

11 17

### List of Elements:

Tetrahedra 17 2 1 11  
Tetrahedra 4 11 7 17  
Tetrahedra 5 17 1 11  
Tetrahedra 4 17 5 11  
Tetrahedra 17 6 2 11  
Tetrahedra 7 6 17 11  
Pyramid 4 5 1 0 11  
Pyramid 6 7 3 2 11



Aspect Ratio:  
0.675428

Jacobian Ratio: 1

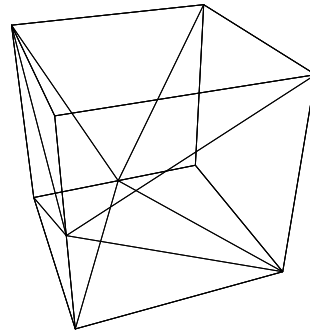
## Pattern 209

### Node index:

11 13

### List of Elements:

Tetrahedra 13 1 0 11  
Tetrahedra 5 13 4 11  
Tetrahedra 4 13 0 11  
Tetrahedra 1 2 11 13  
Tetrahedra 5 6 13 11  
Tetrahedra 6 2 13 11  
Pyramid 6 7 3 2 11  
Pyramid 7 6 5 4 11



Aspect Ratio:  
0.615762

Jacobian Ratio: 1

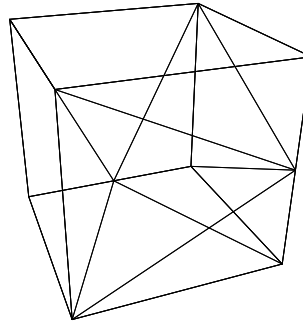
## Pattern 210

### Node index:

11 14

### List of Elements:

Tetrahedra 11 1 14 5  
Tetrahedra 11 1 2 14  
Tetrahedra 11 5 14 6  
Tetrahedra 11 2 3 14  
Tetrahedra 11 14 3 7  
Tetrahedra 11 6 14 7  
Pyramid 4 5 1 0 11  
Pyramid 5 4 7 6 11



Aspect Ratio:  
0.615762

Jacobian Ratio: 1

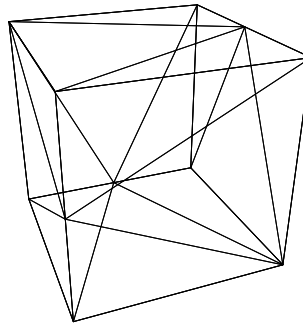
## Pattern 211

### Node index:

11 13 18

### List of Elements:

Tetrahedra 13 1 0 11  
Tetrahedra 5 13 4 11  
Tetrahedra 4 13 0 11  
Tetrahedra 3 18 7 11  
Tetrahedra 7 18 4 11  
Tetrahedra 18 5 4 11  
Tetrahedra 2 6 18 11  
Tetrahedra 18 3 2 11  
Tetrahedra 2 1 13 11  
Tetrahedra 6 13 5 11  
Tetrahedra 13 6 2 11  
Tetrahedra 18 6 5 11



Aspect Ratio:  
0.527607

Jacobian Ratio: 1

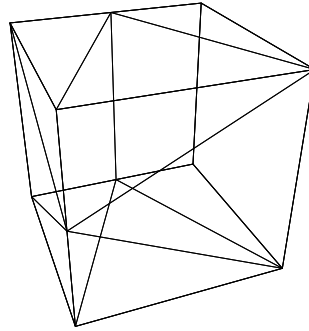
## Pattern 212

### Node index:

11 13 19

### List of Elements:

Tetrahedra 13 1 0 11  
Tetrahedra 19 5 4 13  
Tetrahedra 13 2 1 11  
Tetrahedra 5 6 13 19  
Pyramid 11 19 4 0 13  
Pyramid 6 19 11 2 13  
Prism 2 3 11 6 7 19



Aspect Ratio:  
0.579529

Jacobian Ratio: 1

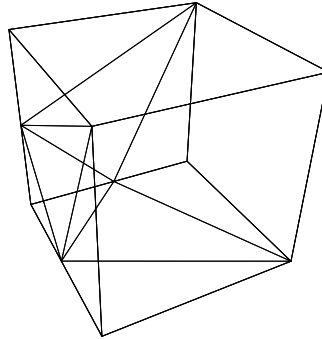
## Pattern 213

### Node index:

8 11 12

### List of Elements:

Tetrahedra 0 8 11 12  
Tetrahedra 11 12 8 6  
Tetrahedra 2 11 8 6  
Tetrahedra 6 7 11 12  
Tetrahedra 8 12 5 6  
Pyramid 5 6 2 1 8  
Pyramid 6 7 3 2 11  
Pyramid 7 6 5 4 12



Aspect Ratio:  
0.725086

Jacobian Ratio: 1

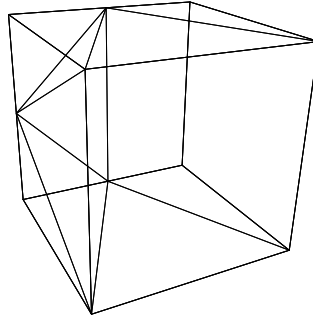
## Pattern 214

**Node index:**

11 12 19

**List of Elements:**

Tetrahedra 0 12 1 11  
Tetrahedra 5 12 4 19  
Pyramid 5 19 11 1 12  
Prism 2 3 11 6 7 19  
Prism 1 2 11 5 6 19



Aspect Ratio:  
0.658984

Jacobian Ratio: 1

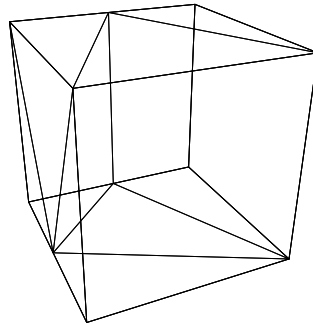
## Pattern 215

**Node index:**

8 11 19

**List of Elements:**

Tetrahedra 19 5 4 8  
Tetrahedra 6 19 8 5  
Pyramid 0 11 19 4 8  
Pyramid 5 6 2 1 8  
Pyramid 2 6 19 11 8  
Prism 2 3 11 6 7 19



Aspect Ratio:  
0.724006

Jacobian Ratio: 1

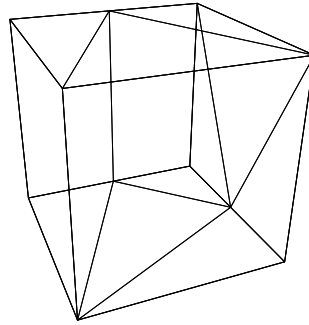
## Pattern 216

### Node index:

10 11 19

### List of Elements:

Tetrahedra 19 7 6 10  
Tetrahedra 5 6 10 19  
Pyramid 7 19 11 3 10  
Pyramid 5 6 2 1 10  
Pyramid 11 19 5 1 10  
Prism 0 1 11 4 5 19



Aspect Ratio:  
0.724006

Jacobian Ratio: 1

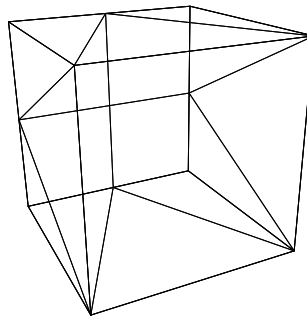
## Pattern 217

### Node index:

11 12 15 19 24

### List of Elements:

Tetrahedra 1 24 12 5  
Tetrahedra 6 24 15 2  
Tetrahedra 6 19 24 5  
Tetrahedra 2 24 11 1  
Pyramid 0 11 24 12 1  
Pyramid 11 3 15 24 2  
Pyramid 15 7 19 24 6  
Pyramid 12 24 19 4 5  
Pyramid 1 5 6 2 24



Aspect Ratio:  
0.583794

Jacobian Ratio: 1

## Pattern 218

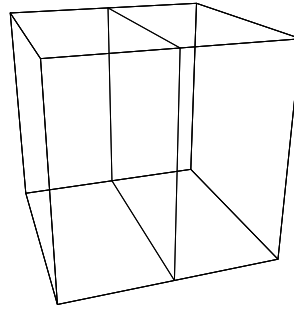
**Node index:**

9 11 17 19

**List of Elements:**

Hexaedra 0 1 9 11 4 5 17 19

Hexaedra 11 9 2 3 19 17 6 7



Aspect Ratio:

0.5

Jacobian Ratio: 1

## Pattern 219

**Node index:**

11 13 14 19

**List of Elements:**

Tetrahedra 0 1 11 13

Tetrahedra 4 13 19 5

Tetrahedra 19 14 7 6

Tetrahedra 11 2 3 14

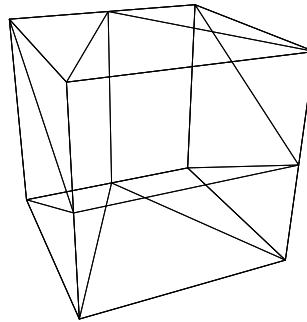
Tetrahedra 11 13 14 19

Pyramid 1 13 14 2 11

Pyramid 5 6 14 13 19

Pyramid 3 7 19 11 14

Pyramid 11 19 4 0 13



Aspect Ratio:

0.496472

Jacobian Ratio: 1



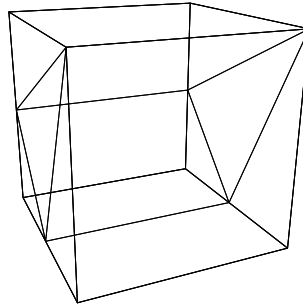
## Pattern 220

**Node index:**

8 10 12 15

**List of Elements:**

Prism 5 8 12 6 10 15  
Prism 2 6 10 1 5 8  
Prism 6 7 15 5 4 12  
Prism 8 0 12 10 3 15



Aspect Ratio:  
0.646258

Jacobian Ratio: 1

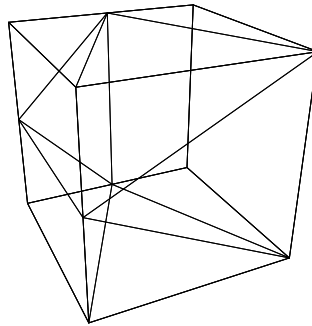
## Pattern 221

**Node index:**

11 12 13 19

**List of Elements:**

Tetrahedra 11 1 2 13  
Tetrahedra 11 12 13 19  
Tetrahedra 19 13 6 5  
Pyramid 12 13 1 0 11  
Pyramid 4 5 13 12 19  
Pyramid 11 2 6 19 13  
Prism 3 11 2 7 19 6



Aspect Ratio:  
0.607299

Jacobian Ratio: 1

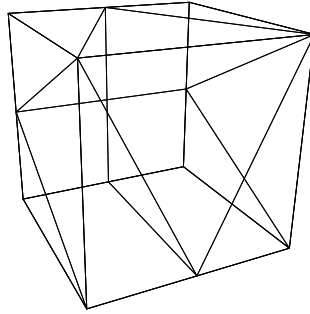
## Pattern 222

### Node index:

9 11 12 15 19 24

### List of Elements:

Tetrahedra 24 5 6 19  
Tetrahedra 24 5 9 6  
Pyramid 19 24 15 7 6  
Pyramid 4 12 24 19 5  
Pyramid 12 1 9 24 5  
Pyramid 24 9 2 15 6  
Prism 0 12 1 11 24 9  
Prism 11 24 9 3 15 2



Aspect Ratio:  
0.545265

Jacobian Ratio: 1

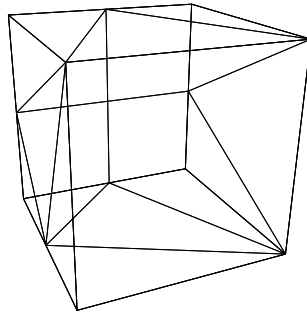
## Pattern 223

### Node index:

8 11 12 15 19 24

### List of Elements:

Tetrahedra 5 19 6 24  
Tetrahedra 6 15 2 24  
Tetrahedra 5 24 8 12  
Tetrahedra 5 1 8 24  
Tetrahedra 2 11 8 24  
Tetrahedra 1 2 8 24  
Pyramid 15 7 19 24 6  
Pyramid 12 24 19 4 5  
Pyramid 15 24 11 3 2  
Pyramid 0 11 24 12 8  
Pyramid 1 5 6 2 24



Aspect Ratio:  
0.571559

Jacobian Ratio: 1

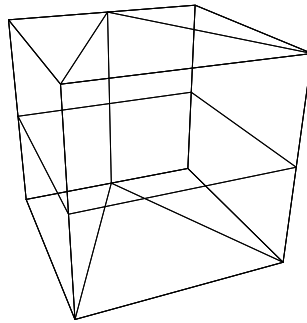
## Pattern 224

**Node index:**

11 12 13 14 15 19 24

**List of Elements:**

Prism 0 1 11 12 13 24  
Prism 2 3 11 14 15 24  
Prism 14 15 24 6 7 19  
Prism 12 13 24 4 5 19  
Prism 1 2 11 13 14 24  
Prism 13 14 24 5 6 19



Aspect Ratio:  
0.5

Jacobian Ratio: 1

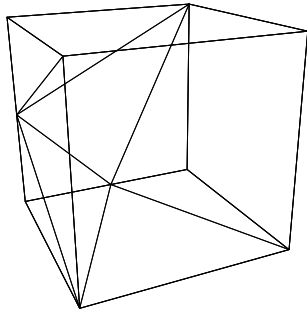
## Pattern 225

**Node index:**

11 12

**List of Elements:**

Tetrahedra 1 11 0 12  
Tetrahedra 1 12 5 11  
Tetrahedra 7 12 11 6  
Tetrahedra 11 12 5 6  
Pyramid 7 6 5 4 12  
Pyramid 6 7 3 2 11  
Pyramid 5 6 2 1 11



Aspect Ratio:  
0.665591

Jacobian Ratio: 1

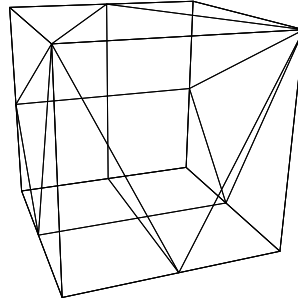
## Pattern 226

### Node index:

8 9 10 11 12 15 19 20 24

### List of Elements:

Tetrahedra 5 20 6 9  
Tetrahedra 6 24 5 19  
Tetrahedra 5 24 6 20  
Pyramid 12 24 19 4 5  
Pyramid 24 15 7 19 6  
Pyramid 9 20 8 1 5  
Pyramid 9 2 10 20 6  
Pyramid 12 8 20 24 5  
Pyramid 24 20 10 15 6  
Prism 11 20 24 0 8 12  
Prism 15 3 10 24 11 20



Aspect Ratio:  
0.594068

Jacobian Ratio: 1

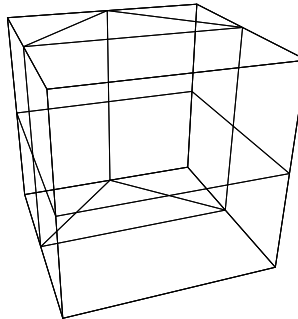
## Pattern 227

### Node index:

8 10 11 12 13 14 15 16 18 19 21 23 24

### List of Elements:

Prism 15 23 24 3 10 11  
Prism 7 18 19 15 23 24  
Prism 0 8 11 12 21 24  
Prism 12 21 24 4 16 19  
Prism 11 8 10 24 21 23  
Prism 24 21 23 19 16 18  
Hexaedra 21 13 14 23 16 5 6 18  
Hexaedra 8 1 2 10 21 13 14 23



Aspect Ratio:  
0.730327

Jacobian Ratio: 1

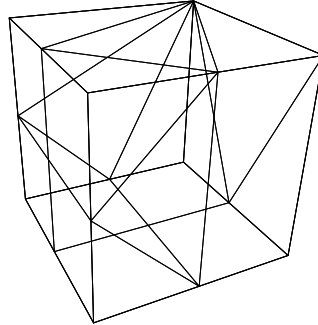
## Pattern 228

### Node index:

8 9 10 11 12 13 16 17 20 21

### List of Elements:

Prism 0 11 12 8 20 21  
Prism 8 20 21 1 9 13  
Pyramid 16 21 12 4 7  
Pyramid 11 12 21 20 7  
Pyramid 10 3 11 20 7  
Pyramid 5 13 21 16 17  
Pyramid 20 21 13 9 17  
Prism 2 6 10 9 17 20  
Tetrahedra 7 17 16 21  
Tetrahedra 7 17 21 20  
Pyramid 10 20 17 6 7



Aspect Ratio:  
0.627381

Jacobian Ratio: 1

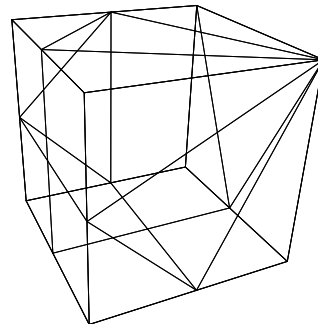
## Pattern 229

### Node index:

8 9 10 11 12 13 16 19 20 21

### List of Elements:

Prism 8 20 21 1 9 13  
Prism 0 11 12 8 20 21  
Pyramid 5 13 21 16 6  
Pyramid 20 21 13 9 6  
Pyramid 20 9 2 10 6  
Pyramid 16 21 12 4 19  
Pyramid 11 12 21 20 19  
Prism 11 19 20 3 7 10  
Tetrahedra 16 19 6 21  
Tetrahedra 21 19 6 20  
Pyramid 7 19 20 10 6



Aspect Ratio:  
0.627381

Jacobian Ratio: 1

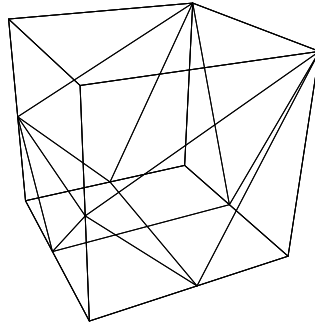
## Pattern 230

### Node index:

8 9 10 11 12 13 20

### List of Elements:

Pyramid 9 20 8 1 13  
Pyramid 0 8 20 11 12  
Pyramid 10 20 9 2 6  
Pyramid 11 20 10 3 7  
Pyramid 7 6 13 12 20  
Tetrahedra 20 13 12 8  
Tetrahedra 7 6 20 10  
Tetrahedra 13 20 6 9  
Tetrahedra 7 20 12 11  
Prism 13 5 6 12 4 7



Aspect Ratio:  
0.62464

Jacobian Ratio: 1

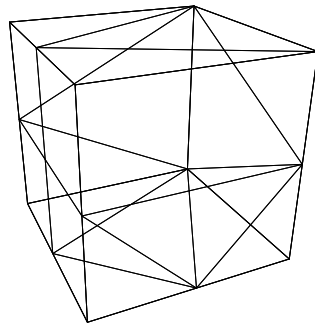
## Pattern 231

### Node index:

8 9 12 13 14 16 21

### List of Elements:

Pyramid 12 21 8 0 3  
Pyramid 1 8 21 13 9  
Tetrahedra 3 8 9 21  
Tetrahedra 9 21 14 3  
Tetrahedra 14 21 9 13  
Tetrahedra 7 12 3 21  
Tetrahedra 3 21 14 7  
Pyramid 16 21 12 4 7  
Pyramid 21 16 6 14 7  
Prism 6 5 16 14 13 21  
Tetrahedra 2 9 14 3



Aspect Ratio:  
0.616803

Jacobian Ratio: 1

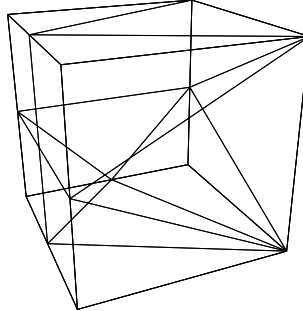
## Pattern 232

### Node index:

8 11 12 13 15 16 21

### List of Elements:

Pyramid 1 8 21 13 2  
Pyramid 12 21 8 0 11  
Tetrahedra 11 8 2 21  
Tetrahedra 15 21 11 2  
Tetrahedra 11 21 15 12  
Tetrahedra 2 13 6 21  
Tetrahedra 15 21 2 6  
Pyramid 5 13 21 16 6  
Pyramid 15 7 16 21 6  
Prism 15 12 21 7 4 16  
Tetrahedra 15 11 3 2



Aspect Ratio:  
0.616803

Jacobian Ratio: 1

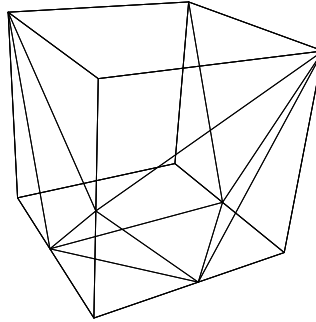
## Pattern 233

### Node index:

8 9 10 13

### List of Elements:

Tetrahedra 10 13 9 6  
Tetrahedra 10 8 9 13  
Tetrahedra 9 8 1 13  
Tetrahedra 10 9 2 6  
Prism 7 3 10 4 0 8  
Pyramid 8 10 7 4 13  
Tetrahedra 7 10 6 13  
Pyramid 7 6 5 4 13



Aspect Ratio:  
0.696609

Jacobian Ratio: 1

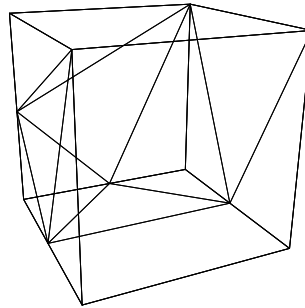
## Pattern 234

### Node index:

8 10 11 12

### List of Elements:

Tetrahedra 11 12 10 7  
Tetrahedra 11 8 10 12  
Tetrahedra 0 8 11 12  
Tetrahedra 3 11 10 7  
Prism 5 1 8 6 2 10  
Pyramid 5 6 10 8 12  
Tetrahedra 7 10 6 12  
Pyramid 5 4 7 6 12



Aspect Ratio:  
0.696609

Jacobian Ratio: 1

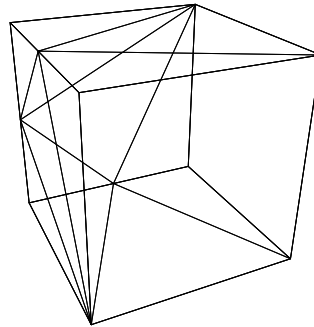
## Pattern 235

### Node index:

11 12 16

### List of Elements:

Tetrahedra 0 1 11 12  
Pyramid 6 7 3 2 11  
Tetrahedra 16 12 4 7  
Tetrahedra 12 11 7 16  
Tetrahedra 11 12 1 16  
Tetrahedra 1 11 16 5  
Tetrahedra 16 7 6 11  
Tetrahedra 5 6 11 16  
Pyramid 5 6 2 1 11



Aspect Ratio:  
0.595003

Jacobian Ratio: 1



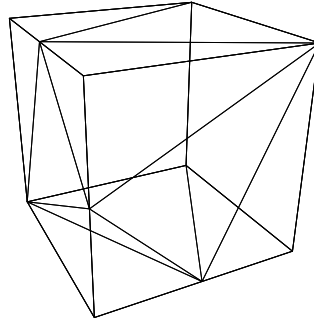
## Pattern 236

### Node index:

9 13 16

### List of Elements:

Tetrahedra 9 0 1 13  
Pyramid 3 2 6 7 9  
Tetrahedra 5 13 16 6  
Tetrahedra 6 9 13 16  
Tetrahedra 0 13 9 16  
Tetrahedra 16 9 0 4  
Tetrahedra 7 6 16 9  
Tetrahedra 9 7 4 16  
Pyramid 0 3 7 4 9



Aspect Ratio:  
0.595003

Jacobian Ratio: 1

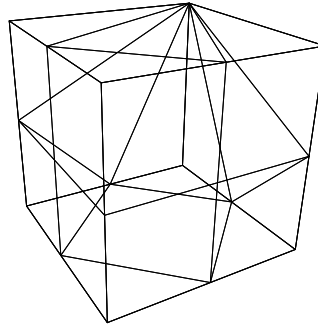
## Pattern 237

### Node index:

8 9 10 11 12 13 14 16 17 21 22

### List of Elements:

Prism 13 21 22 1 8 9  
Prism 8 11 21 9 10 22  
Tetrahedra 11 10 3 7  
Pyramid 12 21 8 0 11  
Pyramid 2 9 22 14 10  
Pyramid 10 11 21 22 7  
Tetrahedra 11 12 21 7  
Tetrahedra 22 14 10 7  
Pyramid 16 21 12 4 7  
Pyramid 16 17 22 21 7  
Pyramid 6 14 22 17 7  
Prism 5 16 17 13 21 22



Aspect Ratio:  
0.677251

Jacobian Ratio: 1

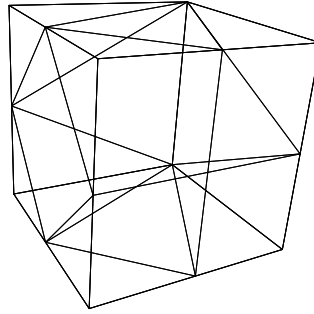
## Pattern 238

### Node index:

8 9 12 13 14 16 17 22

### List of Elements:

Tetrahedra 12 8 0 3  
Tetrahedra 16 12 4 7  
Pyramid 9 22 14 2 3  
Tetrahedra 14 7 3 22  
Tetrahedra 8 9 3 22  
Pyramid 14 22 17 6 7  
Tetrahedra 8 12 22 3  
Tetrahedra 3 7 12 22  
Pyramid 13 22 9 1 8  
Tetrahedra 12 16 22 7  
Tetrahedra 17 16 7 22  
Pyramid 17 22 13 5 16  
Pyramid 8 12 16 13 22



Aspect Ratio:  
0.691731

Jacobian Ratio: 1

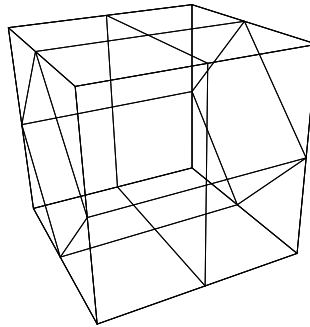
## Pattern 239

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 20  
22 24 25

### List of Elements:

Prism 19 24 25 4 12 16  
Prism 7 15 18 19 24 25  
Prism 22 17 25 13 5 16  
Prism 14 6 18 22 17 25  
Prism 8 0 12 20 11 24  
Prism 20 11 24 10 3 15  
Prism 1 8 13 9 20 22  
Prism 9 20 22 2 10 14  
Hexaedra 8 12 16 13 20 24 25 22  
Hexaedra 20 24 25 22 10 15 18 14



Aspect Ratio:  
0.856963

Jacobian Ratio: 1

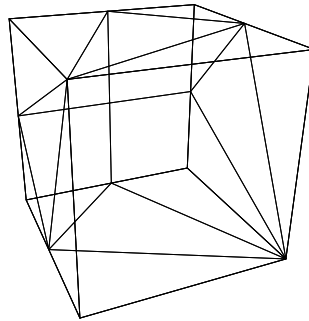
## Pattern 240

### Node index:

8 11 12 15 18 19 24

### List of Elements:

Pyramid 12 24 19 4 5  
Pyramid 7 19 24 15 18  
Pyramid 11 24 12 0 8  
Pyramid 15 24 11 3 2  
Tetrahedra 11 8 2 24  
Tetrahedra 19 18 5 24  
Tetrahedra 5 8 12 24  
Tetrahedra 18 15 2 24  
Tetrahedra 8 5 1 24  
Tetrahedra 18 6 5 24  
Tetrahedra 2 8 1 24  
Tetrahedra 2 6 18 24  
Pyramid 5 6 2 1 24



Aspect Ratio:  
0.56309

Jacobian Ratio: 1

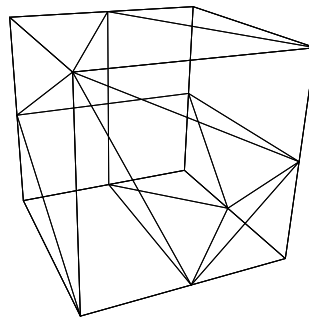
## Pattern 241

### Node index:

9 10 11 12 14 15 19 24

### List of Elements:

Tetrahedra 2 9 14 10  
Pyramid 15 24 11 3 10  
Tetrahedra 9 10 11 24  
Tetrahedra 24 15 14 10  
Tetrahedra 24 14 9 10  
Prism 14 15 24 6 7 19  
Pyramid 4 12 24 19 5  
Prism 11 9 24 0 1 12  
Tetrahedra 9 14 24 5  
Pyramid 1 9 24 12 5  
Pyramid 19 24 14 6 5



Aspect Ratio:  
0.611825

Jacobian Ratio: 1

## Pattern 242

### Node index:

8 9 11 12 13 14 15 17 19 22 24

### List of Elements:

Pyramid 11 24 12 0 8

Pyramid 22 24 11 9 8

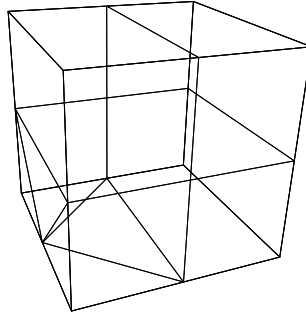
Pyramid 13 22 9 1 8

Pyramid 24 22 13 12 8

Hexaedra 12 13 22 24 4 5 17 19

Hexaedra 2 3 11 9 14 15 24 22

Hexaedra 14 15 24 22 6 7 19 17



Aspect Ratio:

0.590428

Jacobian Ratio: 1

## Pattern 243

### Node index:

10 11 12 13 14 15 18 19 23 24

### List of Elements:

Prism 12 13 24 4 5 19

Prism 0 1 11 12 13 24

Prism 7 18 19 15 23 24

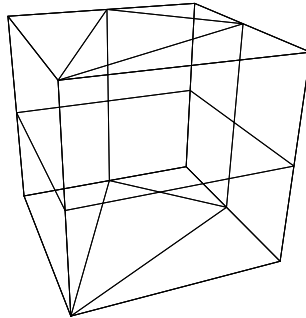
Prism 15 23 24 3 10 11

Prism 13 23 24 5 18 19

Prism 1 10 11 13 23 24

Prism 13 14 23 5 6 18

Prism 1 2 10 13 14 23



Aspect Ratio:

0.58541

Jacobian Ratio: 1

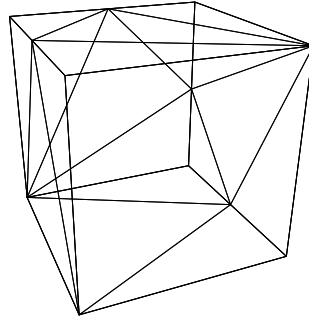
## Pattern 244

### Node index:

10 15 16 19

### List of Elements:

Tetrahedra 19 16 4 0  
Tetrahedra 19 15 7 6  
Tetrahedra 3 10 15 0  
Tetrahedra 0 15 19 16  
Tetrahedra 6 16 19 15  
Tetrahedra 0 10 15 16  
Tetrahedra 15 10 6 16  
Tetrahedra 16 1 0 10  
Tetrahedra 16 5 1 10  
Tetrahedra 16 6 5 10  
Pyramid 5 6 2 1 10



Aspect Ratio:  
0.615839

Jacobian Ratio: 1

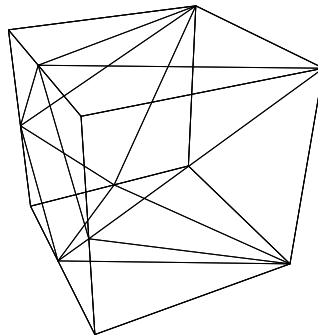
## Pattern 245

### Node index:

8 11 12 13 16

### List of Elements:

Tetrahedra 0 8 11 12  
Tetrahedra 16 12 4 7  
Tetrahedra 12 11 7 16  
Tetrahedra 3 7 11 16  
Pyramid 6 7 3 2 16  
Tetrahedra 2 3 11 16  
Tetrahedra 11 8 2 13  
Tetrahedra 16 13 11 2  
Pyramid 8 12 16 13 11  
Tetrahedra 1 8 13 2  
Tetrahedra 13 6 2 16  
Tetrahedra 5 13 16 6



Aspect Ratio:  
0.569491

Jacobian Ratio: 1

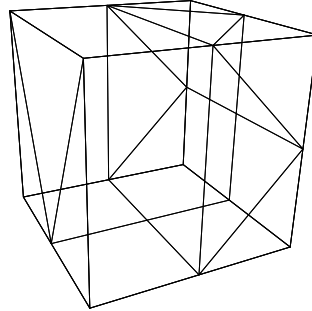
## Pattern 246

### Node index:

8 9 10 11 14 15 17 18 19 20 23

### List of Elements:

Prism 10 20 23 3 11 15  
Prism 2 9 14 10 20 23  
Pyramid 7 15 23 18 19  
Pyramid 18 23 14 6 17  
Tetrahedra 19 18 17 23  
Pyramid 20 23 15 11 19  
Pyramid 9 14 23 20 17  
Tetrahedra 17 20 19 23  
Prism 0 4 8 11 19 20  
Prism 4 5 8 19 17 20  
Prism 9 17 20 1 5 8



Aspect Ratio:  
0.695267

Jacobian Ratio: 1

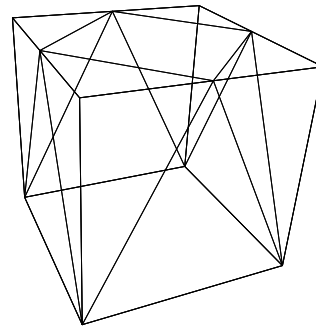
## Pattern 247

### Node index:

16 17 18 19

### List of Elements:

Tetrahedra 5 16 17 1  
Tetrahedra 19 16 4 0  
Tetrahedra 7 18 19 3  
Tetrahedra 6 17 18 2  
Tetrahedra 0 3 19 16  
Pyramid 19 18 17 16 3  
Tetrahedra 18 3 2 17  
Tetrahedra 0 3 16 17  
Pyramid 0 1 2 3 17  
Tetrahedra 16 1 0 17



Aspect Ratio:  
0.551876

Jacobian Ratio: 1

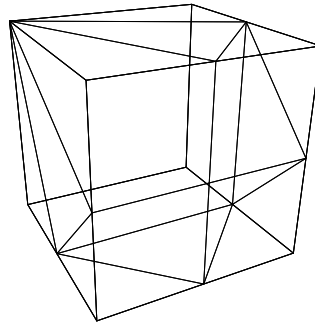
## Pattern 248

### Node index:

8 9 10 13 14 17 18 22

### List of Elements:

Pyramid 0 8 10 3 22  
Tetrahedra 8 9 10 22  
Pyramid 10 18 7 3 22  
Tetrahedra 10 14 18 22  
Pyramid 2 9 22 14 10  
Pyramid 0 3 7 4 22  
Tetrahedra 4 7 18 22  
Tetrahedra 18 17 4 22  
Tetrahedra 4 8 0 22  
Tetrahedra 13 8 4 22  
Pyramid 17 22 13 5 4  
Pyramid 13 22 9 1 8  
Pyramid 6 14 22 17 18



Aspect Ratio:  
0.632542

Jacobian Ratio: 1

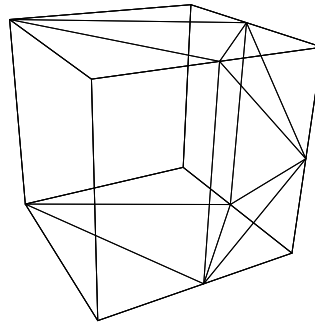
## Pattern 249

### Node index:

9 10 14 17 18

### List of Elements:

Prism 4 7 18 0 3 10  
Prism 4 18 17 0 10 9  
Prism 0 1 9 4 5 17  
Pyramid 9 10 18 17 14  
Tetrahedra 6 14 17 18  
Tetrahedra 2 9 14 10



Aspect Ratio:  
0.662831

Jacobian Ratio: 1

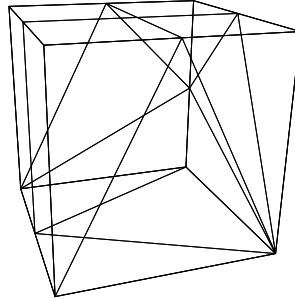
## Pattern 250

### Node index:

8 15 16 17 18 19 25

### List of Elements:

Pyramid 7 18 25 19 15  
Tetrahedra 8 3 0 15  
Pyramid 19 25 8 0 15  
Tetrahedra 2 3 8 15  
Tetrahedra 25 15 2 8  
Tetrahedra 18 15 2 25  
Pyramid 6 17 25 18 2  
Pyramid 1 8 25 17 2  
Prism 1 5 17 8 16 25  
Prism 8 16 25 0 4 19



Aspect Ratio:  
0.570002

Jacobian Ratio: 1

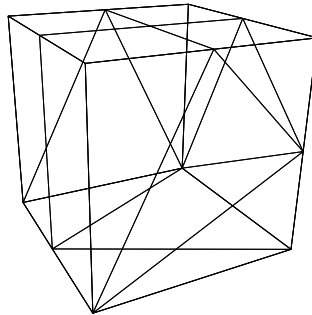
## Pattern 251

### Node index:

8 14 16 17 18 19 25

### List of Elements:

Pyramid 17 25 18 6 14  
Tetrahedra 1 2 8 14  
Pyramid 1 8 25 17 14  
Tetrahedra 8 2 3 14  
Tetrahedra 3 14 25 8  
Tetrahedra 3 14 18 25  
Pyramid 18 25 19 7 3  
Pyramid 19 25 8 0 3  
Prism 8 16 25 0 4 19  
Prism 1 5 17 8 16 25



Aspect Ratio:  
0.570002

Jacobian Ratio: 1



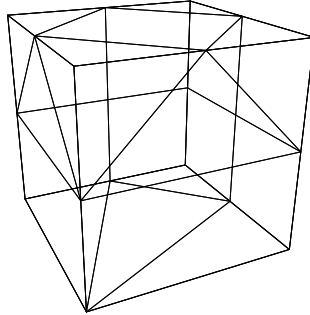
## Pattern 252

### Node index:

10 11 12 13 14 15 16 17 18 19 23 24

### List of Elements:

Prism 0 1 11 12 13 24  
Prism 1 10 11 13 23 24  
Prism 1 2 10 13 14 23  
Prism 15 23 24 3 10 11  
Prism 7 18 19 15 23 24  
Pyramid 4 12 24 19 16  
Pyramid 18 23 14 6 17  
Prism 17 18 23 16 19 24  
Pyramid 24 23 17 16 13  
Tetrahedra 16 13 12 24  
Tetrahedra 17 14 13 23  
Tetrahedra 17 13 5 16



Aspect Ratio:  
0.708832

Jacobian Ratio: 1

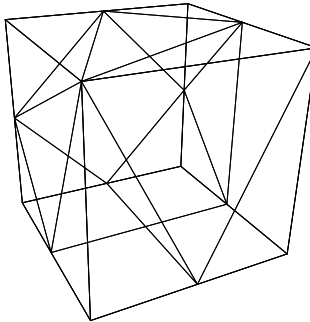
## Pattern 253

### Node index:

8 9 10 11 12 15 18 19 20

### List of Elements:

Pyramid 11 20 10 3 15  
Tetrahedra 7 18 19 15  
Pyramid 0 8 20 11 12  
Pyramid 15 19 12 11 20  
Tetrahedra 19 5 12 20  
Tetrahedra 4 12 19 5  
Tetrahedra 5 8 12 20  
Tetrahedra 18 15 10 20  
Tetrahedra 20 19 18 15  
Tetrahedra 19 18 5 20  
Prism 10 18 20 2 6 9  
Pyramid 18 20 9 6 5  
Pyramid 9 20 8 1 5



Aspect Ratio:  
0.687518

Jacobian Ratio: 1

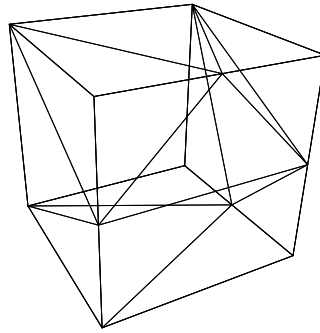
## Pattern 254

### Node index:

10 13 14 17

### List of Elements:

Pyramid 0 3 7 4 10  
Tetrahedra 0 1 10 13  
Tetrahedra 0 4 13 10  
Pyramid 4 7 14 13 10  
Pyramid 13 14 2 1 10  
Pyramid 13 14 7 4 17  
Tetrahedra 17 13 5 4  
Tetrahedra 6 14 17 7



Aspect Ratio:  
0.653093

Jacobian Ratio: 1

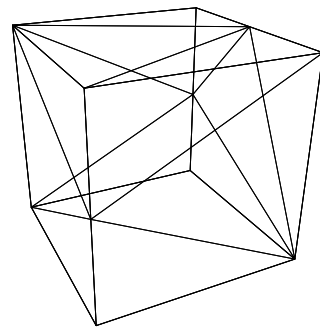
## Pattern 255

### Node index:

13 15 18

### List of Elements:

Pyramid 0 1 2 3 13  
Tetrahedra 15 7 4 18  
Tetrahedra 0 3 15 13  
Tetrahedra 15 4 0 13  
Tetrahedra 15 3 2 13  
Tetrahedra 4 5 13 15  
Tetrahedra 18 5 4 15  
Tetrahedra 5 13 15 18  
Tetrahedra 18 15 2 13  
Tetrahedra 2 6 18 13  
Tetrahedra 5 6 13 18



Aspect Ratio:  
0.563806

Jacobian Ratio: 1

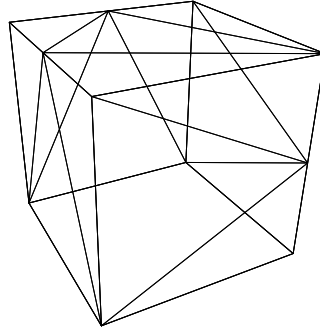
## Pattern 256

### Node index:

14 16 19

### List of Elements:

Tetrahedra 19 16 4 0  
Pyramid 0 1 2 3 14  
Tetrahedra 14 7 3 19  
Tetrahedra 19 7 6 14  
Tetrahedra 0 3 19 14  
Tetrahedra 19 16 0 14  
Tetrahedra 16 1 0 14  
Tetrahedra 1 5 14 16  
Tetrahedra 16 19 6 14  
Tetrahedra 16 6 5 14



Aspect Ratio:  
0.640968

Jacobian Ratio: 1

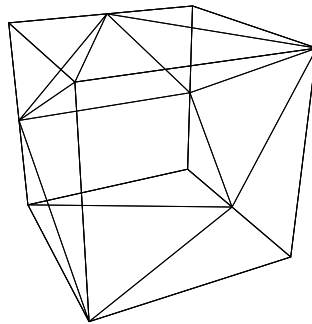
## Pattern 257

### Node index:

10 12 15 19

### List of Elements:

Pyramid 5 6 2 1 10  
Tetrahedra 10 0 1 12  
Tetrahedra 12 5 1 10  
Pyramid 12 15 6 5 10  
Pyramid 0 3 15 12 10  
Pyramid 5 6 15 12 19  
Tetrahedra 4 12 19 5  
Tetrahedra 19 15 7 6



Aspect Ratio:  
0.653093

Jacobian Ratio: 1

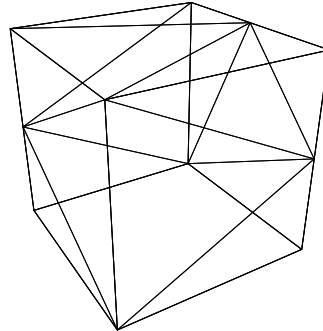
## Pattern 258

### Node index:

12 14 18

### List of Elements:

Pyramid 2 3 0 1 12  
Tetrahedra 5 6 14 18  
Tetrahedra 14 2 1 12  
Tetrahedra 1 5 14 12  
Tetrahedra 3 2 14 12  
Tetrahedra 12 4 5 14  
Tetrahedra 5 4 18 14  
Tetrahedra 14 12 4 18  
Tetrahedra 3 14 18 12  
Tetrahedra 18 7 3 12  
Tetrahedra 12 7 4 18



Aspect Ratio:  
0.563806

Jacobian Ratio: 1

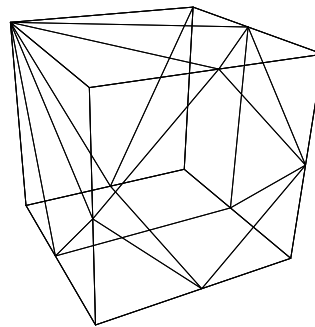
## Pattern 259

### Node index:

8 9 10 11 13 14 17 18 20

### List of Elements:

Pyramid 2 10 20 9 14  
Tetrahedra 17 18 6 14  
Pyramid 9 20 8 1 13  
Pyramid 9 13 17 14 20  
Tetrahedra 13 4 17 20  
Tetrahedra 17 13 5 4  
Tetrahedra 13 8 4 20  
Tetrahedra 10 14 18 20  
Tetrahedra 18 17 20 14  
Tetrahedra 4 18 17 20  
Prism 3 7 11 10 18 20  
Pyramid 7 11 20 18 4  
Pyramid 0 8 20 11 4



Aspect Ratio:  
0.687518

Jacobian Ratio: 1

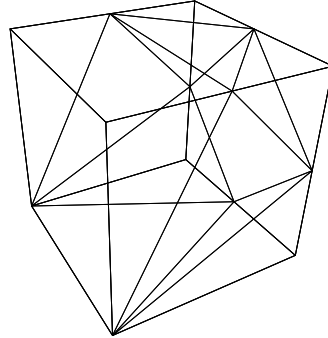
## Pattern 260

### Node index:

10 14 15 17 18 19

### List of Elements:

Tetrahedra 10 3 0 15  
Tetrahedra 1 2 10 14  
Tetrahedra 7 15 18 19  
Tetrahedra 18 15 0 19  
Pyramid 10 14 18 15 0  
Tetrahedra 0 1 10 14  
Tetrahedra 0 1 14 18  
Pyramid 19 17 1 0 18  
Tetrahedra 17 14 1 18  
Tetrahedra 6 17 18 14  
Prism 1 5 17 0 4 19



Aspect Ratio:  
0.597636

Jacobian Ratio: 1

## 4 Patterns with cube's central node

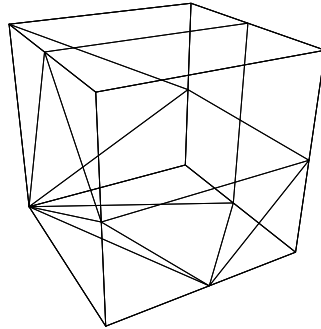
### Pattern 261

**Node index:**

9 10 13 14 15 16 18 23 26

**List of Elements:**

Pyramid 3 10 23 15 26  
Pyramid 10 2 14 23 26  
Pyramid 15 23 18 7 26  
Pyramid 23 14 6 18 26  
Tetrahedra 2 10 9 26  
Tetrahedra 2 9 14 26  
Tetrahedra 0 10 3 26  
Tetrahedra 0 3 15 26  
Tetrahedra 0 15 4 26  
Tetrahedra 4 15 7 26  
Tetrahedra 0 9 10 26  
Pyramid 4 7 18 16 26  
Tetrahedra 0 4 16 26  
Tetrahedra 0 1 9 13  
Tetrahedra 0 13 9 26  
Tetrahedra 0 16 13 26  
Tetrahedra 13 14 9 26  
Tetrahedra 5 13 16 26  
Pyramid 5 16 18 6 26  
Pyramid 5 6 14 13 26



Aspect Ratio:  
0.652412

Jacobian Ratio: 1

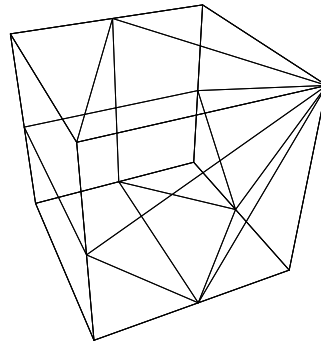
## Pattern 262

### Node index:

9 10 11 12 13 15 19 24 26

### List of Elements:

Pyramid 3 15 24 11 26  
Pyramid 11 24 12 0 26  
Pyramid 15 7 19 24 26  
Pyramid 24 19 4 12 26  
Tetrahedra 3 11 10 26  
Tetrahedra 3 10 15 26  
Tetrahedra 9 10 11 26  
Pyramid 0 1 9 11 26  
Tetrahedra 6 7 15 26  
Tetrahedra 6 15 10 26  
Tetrahedra 6 19 7 26  
Tetrahedra 2 10 9 6  
Tetrahedra 6 10 9 26  
Tetrahedra 5 4 19 26  
Tetrahedra 5 19 6 26  
Pyramid 0 12 13 1 26  
Pyramid 12 4 5 13 26  
Tetrahedra 1 13 9 26  
Tetrahedra 9 13 6 26  
Tetrahedra 5 6 13 26



Aspect Ratio:  
0.652412

Jacobian Ratio: 1

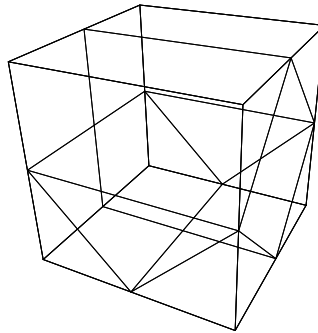
## Pattern 263

### Node index:

8 9 10 11 12 13 14 15 17 19 20 24 26

### List of Elements:

Prism 24 20 11 15 10 3  
Prism 0 12 8 11 24 20  
Pyramid 10 15 24 20 26  
Pyramid 20 24 12 8 26  
Pyramid 15 7 19 24 26  
Pyramid 24 19 4 12 26  
Tetrahedra 10 14 15 26  
Pyramid 14 6 7 15 26  
Pyramid 6 17 19 7 26  
Pyramid 4 19 17 5 26  
Tetrahedra 14 17 6 26  
Tetrahedra 10 20 14 26  
Pyramid 2 10 20 9 14  
Tetrahedra 9 20 26 14  
Tetrahedra 8 20 26 13  
Tetrahedra 8 12 13 26  
Tetrahedra 9 26 20 13  
Pyramid 1 9 20 8 13  
Pyramid 12 4 5 13 26  
Tetrahedra 5 17 13 26  
Pyramid 13 17 14 9 26



Aspect Ratio:  
0.647321

Jacobian Ratio: 1



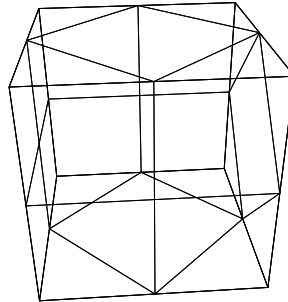
## Pattern 264

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 21  
23 24 26

### List of Elements:

Prism 15 24 23 7 19 18  
Prism 3 11 10 15 24 23  
Prism 24 12 21 19 4 16  
Prism 11 0 8 24 12 21  
Pyramid 18 19 24 23 26  
Pyramid 23 24 11 10 26  
Pyramid 19 16 21 24 26  
Pyramid 24 21 8 11 26  
Pyramid 8 9 10 11 26  
Tetrahedra 9 23 10 26  
Tetrahedra 8 21 9 26  
Pyramid 1 8 21 13 9  
Pyramid 2 14 23 10 9  
Tetrahedra 9 21 13 26  
Tetrahedra 9 14 23 26  
Tetrahedra 17 18 23 26  
Tetrahedra 17 23 14 26  
Pyramid 6 18 23 14 17  
Tetrahedra 16 17 21 26  
Tetrahedra 13 21 17 26  
Pyramid 5 13 21 16 17  
Pyramid 16 19 18 17 26  
Pyramid 13 17 14 9 26



Aspect Ratio:  
0.694288

Jacobian Ratio: 1

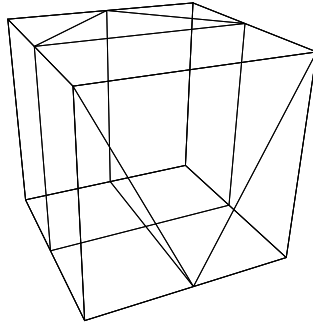
## Pattern 265

### Node index:

11 12 13 14 15 17 19 24 26

### List of Elements:

Pyramid 3 15 24 11 26  
Pyramid 0 11 24 12 26  
Pyramid 15 7 19 24 26  
Pyramid 12 24 19 4 26  
Tetrahedra 2 3 11 26  
Tetrahedra 1 2 11 26  
Pyramid 2 14 15 3 26  
Pyramid 14 6 7 15 26  
Pyramid 6 17 19 7 26  
Tetrahedra 1 11 0 26  
Tetrahedra 6 14 17 26  
Pyramid 5 4 19 17 26  
Pyramid 4 5 13 12 26  
Pyramid 0 12 13 1 26  
Tetrahedra 5 17 13 26  
Tetrahedra 13 17 14 26  
Pyramid 1 13 14 2 26



Aspect Ratio:  
0.622961

Jacobian Ratio: 1

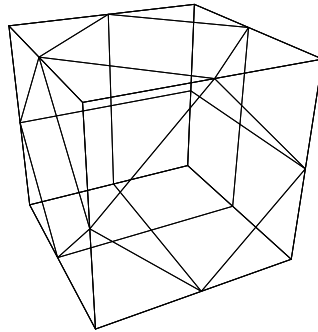
## Pattern 266

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 20  
23 24 26

### List of Elements:

Pyramid 0 11 24 12 26  
Pyramid 12 24 19 4 26  
Pyramid 11 3 15 24 26  
Pyramid 24 15 7 19 26  
Pyramid 2 14 23 10 26  
Pyramid 10 23 15 3 26  
Pyramid 14 6 18 23 26  
Pyramid 23 18 7 15 26  
Pyramid 1 9 20 8 26  
Pyramid 9 2 10 20 26  
Pyramid 10 3 11 20 26  
Pyramid 8 20 11 0 26  
Tetrahedra 4 19 16 26  
Tetrahedra 7 18 19 26  
Tetrahedra 6 17 18 26  
Tetrahedra 4 16 12 26  
Tetrahedra 0 12 8 26  
Tetrahedra 6 14 17 26  
Tetrahedra 2 9 14 26  
Tetrahedra 1 8 13 26  
Tetrahedra 1 13 9 26  
Tetrahedra 13 16 17 26  
Pyramid 16 19 18 17 26  
Pyramid 13 17 14 9 26  
Pyramid 8 12 16 13 26  
Tetrahedra 13 17 16 5



Aspect Ratio:  
0.723503

Jacobian Ratio: 1

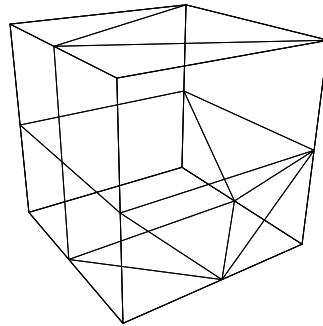
## Pattern 267

### Node index:

8 9 10 12 13 14 15 16 21 26

### List of Elements:

Pyramid 0 3 15 12 26  
Pyramid 12 15 7 4 26  
Pyramid 0 8 10 3 26  
Tetrahedra 8 9 10 26  
Tetrahedra 1 9 8 26  
Tetrahedra 3 10 15 26  
Tetrahedra 14 15 10 26  
Pyramid 14 6 7 15 26  
Tetrahedra 2 9 14 10  
Tetrahedra 9 14 10 26  
Pyramid 1 8 21 13 26  
Pyramid 13 21 16 5 26  
Pyramid 8 0 12 21 26  
Pyramid 4 16 21 12 26  
Tetrahedra 1 13 9 26  
Tetrahedra 4 7 16 26  
Tetrahedra 6 16 7 26  
Tetrahedra 9 13 14 26  
Tetrahedra 5 16 6 26  
Pyramid 13 5 6 14 26



Aspect Ratio:

0.675695

Jacobian Ratio: 1

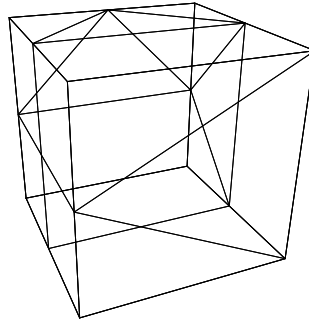
## Pattern 268

### Node index:

8 10 12 13 15 16 18 19 21 26

### List of Elements:

Pyramid 0 8 10 3 26  
Pyramid 0 3 15 12 26  
Pyramid 1 2 10 8 26  
Tetrahedra 12 15 19 26  
Tetrahedra 4 12 19 26  
Tetrahedra 15 7 19 18  
Tetrahedra 4 19 16 26  
Tetrahedra 15 18 19 26  
Tetrahedra 16 19 18 26  
Tetrahedra 10 15 3 26  
Tetrahedra 10 18 15 26  
Pyramid 2 6 18 10 26  
Pyramid 5 16 18 6 26  
Tetrahedra 5 6 13 26  
Tetrahedra 2 13 6 26  
Tetrahedra 1 13 2 26  
Pyramid 0 12 21 8 26  
Pyramid 12 4 16 21 26  
Pyramid 1 8 21 13 26  
Pyramid 21 16 5 13 26



Aspect Ratio:

0.675695

Jacobian Ratio: 1

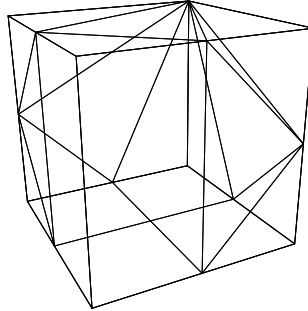
## Pattern 269

### Node index:

8 9 10 11 12 14 16 17 20 26

### List of Elements:

Tetrahedra 3 10 7 26  
Tetrahedra 3 7 11 26  
Pyramid 3 11 20 10 26  
Tetrahedra 7 12 11 26  
Tetrahedra 4 12 7 16  
Tetrahedra 12 7 16 26  
Tetrahedra 0 11 12 26  
Tetrahedra 0 12 8 26  
Pyramid 0 8 20 11 26  
Tetrahedra 8 12 16 26  
Pyramid 1 9 20 8 26  
Pyramid 2 10 20 9 26  
Tetrahedra 7 10 14 26  
Tetrahedra 2 14 10 26  
Tetrahedra 2 9 14 26  
Tetrahedra 6 7 14 26  
Tetrahedra 6 17 7 26  
Tetrahedra 7 17 16 26  
Tetrahedra 6 14 17 26  
Tetrahedra 5 16 17 26  
Tetrahedra 9 17 14 26  
Pyramid 1 5 17 9 26  
Pyramid 1 8 16 5 26



Aspect Ratio:  
0.652009

Jacobian Ratio: 1

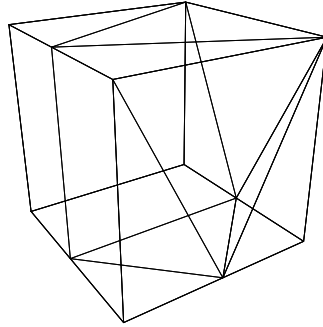
## Pattern 270

### Node index:

8 9 10 16 26

### List of Elements:

Pyramid 0 3 7 4 26  
Pyramid 0 8 10 3 26  
Pyramid 0 4 16 8 26  
Tetrahedra 3 10 7 26  
Tetrahedra 6 7 10 26  
Tetrahedra 4 7 16 26  
Tetrahedra 6 16 7 26  
Tetrahedra 8 9 10 26  
Tetrahedra 2 10 9 26  
Tetrahedra 2 6 10 26  
Tetrahedra 2 9 6 26  
Tetrahedra 1 9 8 26  
Pyramid 1 8 16 5 26  
Tetrahedra 1 5 9 26  
Tetrahedra 5 6 9 26  
Tetrahedra 5 16 6 26  
Tetrahedra 6 10 9 26



Aspect Ratio:  
0.609553

Jacobian Ratio: 1

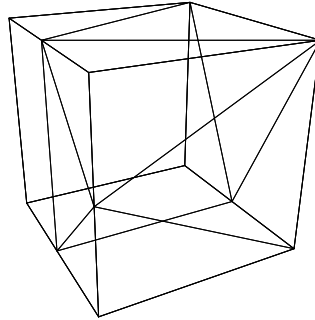
## Pattern 271

### Node index:

8 10 13 16 26

### List of Elements:

Pyramid 0 3 7 4 26  
Pyramid 0 8 10 3 26  
Pyramid 1 2 10 8 26  
Pyramid 0 4 16 8 26  
Tetrahedra 4 7 16 26  
Tetrahedra 10 7 3 26  
Tetrahedra 6 7 10 26  
Tetrahedra 6 16 7 26  
Tetrahedra 2 6 10 26  
Tetrahedra 1 8 13 26  
Tetrahedra 8 16 13 26  
Tetrahedra 5 13 16 26  
Tetrahedra 5 16 6 26  
Tetrahedra 5 6 13 26  
Tetrahedra 1 13 2 26  
Tetrahedra 2 13 6 26



Aspect Ratio:  
0.600631

Jacobian Ratio: 1



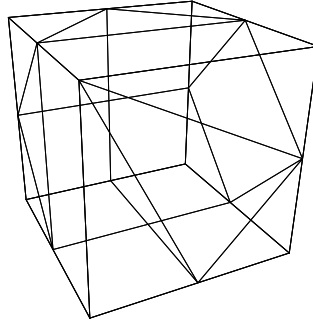
## Pattern 272

### Node index:

8 9 10 11 12 14 15 16 18 19 20 24 26

### List of Elements:

Prism 11 20 24 0 8 12  
Prism 3 10 15 11 20 24  
Pyramid 10 15 24 20 26  
Pyramid 20 24 12 8 26  
Pyramid 2 10 20 9 26  
Pyramid 1 9 20 8 26  
Pyramid 7 19 24 15 26  
Pyramid 4 12 24 19 26  
Tetrahedra 7 15 18 26  
Tetrahedra 7 18 19 26  
Tetrahedra 16 19 18 26  
Tetrahedra 4 19 16 26  
Tetrahedra 4 16 12 26  
Tetrahedra 8 12 16 26  
Pyramid 14 18 15 10 26  
Pyramid 1 8 16 5 26  
Tetrahedra 6 18 14 26  
Pyramid 5 16 18 6 26  
Tetrahedra 5 6 14 26  
Tetrahedra 2 14 10 26  
Tetrahedra 2 9 14 26  
Tetrahedra 5 14 9 26  
Tetrahedra 1 5 9 26



Aspect Ratio:  
0.669459

Jacobian Ratio: 1

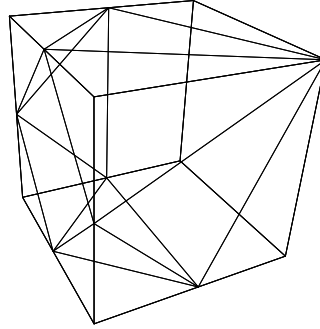
## Pattern 273

### Node index:

8 10 11 12 15 18 19 26

### List of Elements:

Tetrahedra 7 15 18 19  
Tetrahedra 4 19 5 12  
Tetrahedra 0 8 11 12  
Tetrahedra 3 11 10 15  
Pyramid 12 11 15 19 26  
Tetrahedra 5 12 19 26  
Tetrahedra 10 15 11 26  
Tetrahedra 11 12 8 26  
Tetrahedra 8 10 11 26  
Tetrahedra 8 12 5 26  
Tetrahedra 10 18 15 26  
Tetrahedra 15 18 19 26  
Tetrahedra 5 19 18 26  
Pyramid 2 6 18 10 26  
Pyramid 1 2 10 8 26  
Tetrahedra 5 18 6 26  
Tetrahedra 1 8 5 26  
Pyramid 1 5 6 2 26



Aspect Ratio:  
0.721494

Jacobian Ratio: 1

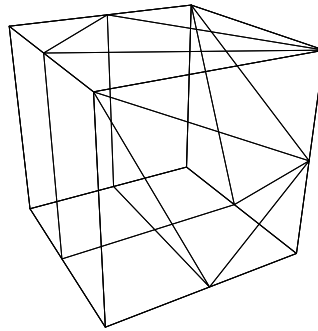
## Pattern 274

### Node index:

8 9 10 11 14 16 19 20 26

### List of Elements:

Pyramid 11 3 7 19 26  
Pyramid 0 11 19 4 26  
Pyramid 0 4 16 8 26  
Pyramid 1 8 16 5 26  
Pyramid 1 9 20 8 26  
Pyramid 9 2 10 20 26  
Pyramid 10 3 11 20 26  
Pyramid 20 11 0 8 26  
Tetrahedra 3 10 7 26  
Tetrahedra 7 10 14 26  
Tetrahedra 2 14 10 26  
Tetrahedra 2 9 14 26  
Tetrahedra 6 7 14 26  
Tetrahedra 6 19 7 26  
Tetrahedra 4 19 16 26  
Tetrahedra 6 16 19 26  
Tetrahedra 5 16 6 26  
Tetrahedra 5 6 14 26  
Tetrahedra 5 14 9 26  
Tetrahedra 1 5 9 26



Aspect Ratio:

0.624707

Jacobian Ratio: 1

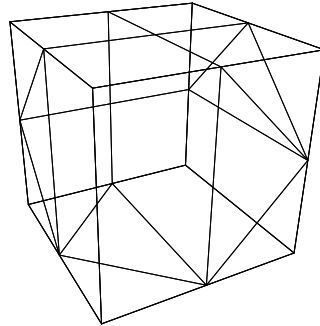
## Pattern 275

### Node index:

8 9 11 12 14 15 16 17 18 19 24 25 26

### List of Elements:

Prism 19 24 25 4 12 16  
Prism 7 15 18 19 24 25  
Pyramid 0 11 24 12 26  
Pyramid 11 3 15 24 26  
Pyramid 2 14 15 3 26  
Pyramid 2 3 11 9 26  
Tetrahedra 0 8 11 26  
Tetrahedra 8 9 11 26  
Tetrahedra 1 9 8 26  
Tetrahedra 14 18 15 26  
Tetrahedra 6 18 14 26  
Tetrahedra 6 14 17 26  
Tetrahedra 9 17 14 26  
Tetrahedra 9 14 2 26  
Pyramid 6 17 25 18 26  
Pyramid 24 15 18 25 26  
Pyramid 12 24 25 16 26  
Tetrahedra 0 12 8 26  
Tetrahedra 8 12 16 26  
Pyramid 5 16 25 17 26  
Pyramid 1 8 16 5 26  
Pyramid 1 5 17 9 26



Aspect Ratio:  
0.67577

Jacobian Ratio: 1

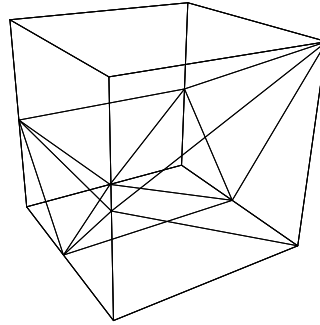
## Pattern 276

### Node index:

8 10 11 12 13 15 26

### List of Elements:

Tetrahedra 10 15 3 11  
Tetrahedra 0 11 12 8  
Tetrahedra 11 10 15 26  
Tetrahedra 8 11 12 26  
Tetrahedra 12 11 15 26  
Tetrahedra 8 10 11 26  
Pyramid 1 2 10 8 26  
Pyramid 12 15 7 4 26  
Tetrahedra 6 15 10 26  
Tetrahedra 7 15 6 26  
Tetrahedra 2 6 10 26  
Tetrahedra 8 12 13 26  
Tetrahedra 1 8 13 26  
Tetrahedra 1 13 2 26  
Tetrahedra 2 13 6 26  
Tetrahedra 5 6 13 26  
Pyramid 12 4 5 13 26  
Pyramid 4 7 6 5 26



Aspect Ratio:  
0.678774

Jacobian Ratio: 1

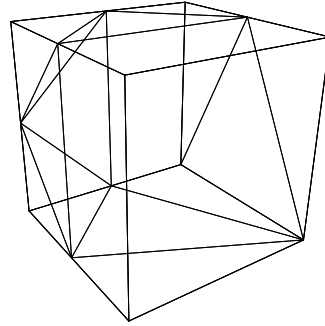
## Pattern 277

### Node index:

8 11 12 16 18 19 26

### List of Elements:

Pyramid 11 3 7 19 26  
Tetrahedra 3 18 7 26  
Tetrahedra 7 18 19 26  
Tetrahedra 2 3 11 26  
Tetrahedra 2 18 3 26  
Tetrahedra 2 6 18 26  
Tetrahedra 4 19 16 12  
Tetrahedra 0 8 11 12  
Pyramid 8 16 19 11 12  
Pyramid 8 11 19 16 26  
Tetrahedra 2 11 8 26  
Tetrahedra 16 19 18 26  
Tetrahedra 1 2 8 26  
Pyramid 1 8 16 5 26  
Pyramid 5 16 18 6 26  
Pyramid 1 5 6 2 26



Aspect Ratio:  
0.583794

Jacobian Ratio: 1

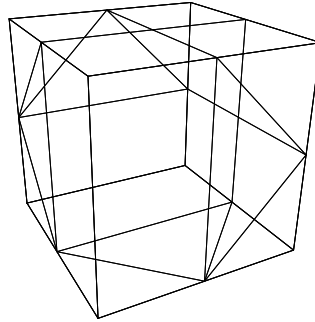
## Pattern 278

### Node index:

8 9 10 12 14 15 16 17 18 19 23 25 26

### List of Elements:

Pyramid 0 8 10 3 26  
Pyramid 0 3 15 12 26  
Tetrahedra 0 12 8 26  
Tetrahedra 12 15 19 26  
Pyramid 3 10 23 15 26  
Pyramid 2 14 23 10 26  
Tetrahedra 2 10 9 26  
Tetrahedra 8 9 10 26  
Tetrahedra 2 9 14 26  
Tetrahedra 1 9 8 26  
Prism 15 7 19 23 18 25  
Prism 23 18 25 14 6 17  
Pyramid 23 25 19 15 26  
Pyramid 14 17 25 23 26  
Tetrahedra 9 17 14 26  
Tetrahedra 4 12 19 26  
Tetrahedra 4 16 12 26  
Tetrahedra 8 12 16 26  
Pyramid 4 19 25 16 26  
Pyramid 5 16 25 17 26  
Pyramid 1 8 16 5 26  
Pyramid 1 5 17 9 26



Aspect Ratio:  
0.67577

Jacobian Ratio: 1

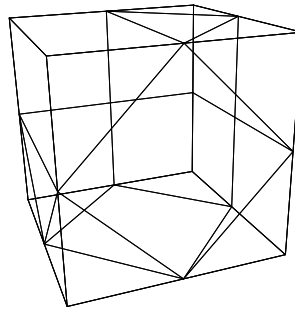
## Pattern 279

### Node index:

8 9 10 11 12 13 14 15 17 18 19 23 24  
26

### List of Elements:

Prism 7 18 19 15 23 24  
Prism 15 23 24 3 10 11  
Pyramid 23 18 19 24 26  
Pyramid 10 23 24 11 26  
Pyramid 8 9 10 11 26  
Pyramid 12 24 19 4 26  
Pyramid 0 11 24 12 26  
Tetrahedra 0 8 11 26  
Tetrahedra 0 12 8 26  
Pyramid 6 18 23 14 26  
Tetrahedra 17 18 6 26  
Tetrahedra 6 14 17 26  
Pyramid 2 14 23 10 26  
Tetrahedra 9 2 10 26  
Tetrahedra 9 14 2 26  
Tetrahedra 17 19 18 26  
Tetrahedra 8 13 9 26  
Tetrahedra 8 9 13 1  
Tetrahedra 8 12 13 26  
Pyramid 12 4 5 13 26  
Pyramid 4 19 17 5 26  
Tetrahedra 5 17 13 26  
Pyramid 13 17 14 9 26



Aspect Ratio:  
0.697085

Jacobian Ratio: 1



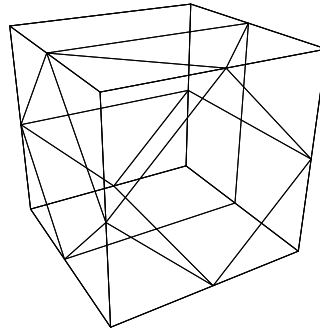
## Pattern 280

### Node index:

8 9 10 11 12 13 14 15 16 17 18 20 23  
26

### List of Elements:

Prism 23 20 10 14 9 2  
Prism 3 15 11 10 23 20  
Pyramid 9 14 23 20 26  
Pyramid 20 23 15 11 26  
Pyramid 0 8 20 11 12  
Tetrahedra 11 15 12 26  
Tetrahedra 20 11 12 26  
Pyramid 23 18 7 15 26  
Pyramid 12 15 7 4 26  
Pyramid 16 4 7 18 26  
Tetrahedra 4 16 12 26  
Tetrahedra 20 12 8 26  
Pyramid 14 6 18 23 17  
Tetrahedra 17 18 23 26  
Tetrahedra 17 23 14 26  
Tetrahedra 16 18 17 26  
Pyramid 1 9 20 8 13  
Tetrahedra 13 9 20 26  
Tetrahedra 13 20 8 26  
Tetrahedra 13 16 17 26  
Tetrahedra 5 17 13 16  
Pyramid 12 16 13 8 26  
Pyramid 13 17 14 9 26



Aspect Ratio:  
0.679936

Jacobian Ratio: 1

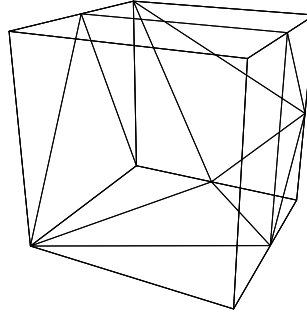
## Pattern 281

### Node index:

8 11 12 17 19 26

### List of Elements:

Pyramid 3 7 19 11 26  
Tetrahedra 11 19 12 26  
Tetrahedra 2 3 11 26  
Pyramid 2 6 7 3 26  
Pyramid 6 17 19 7 26  
Tetrahedra 2 17 6 26  
Tetrahedra 2 11 8 26  
Tetrahedra 1 2 8 26  
Tetrahedra 1 17 2 26  
Tetrahedra 0 8 11 12  
Tetrahedra 8 11 12 26  
Tetrahedra 19 4 12 26  
Pyramid 5 4 19 17 26  
Tetrahedra 5 12 4 26  
Tetrahedra 5 8 12 26  
Tetrahedra 1 8 5 26  
Tetrahedra 1 5 17 26



Aspect Ratio:  
0.629632

Jacobian Ratio: 1

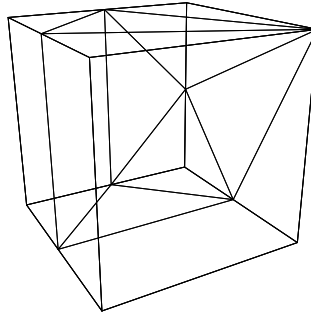
## Pattern 282

### Node index:

8 10 11 15 16 19 26

### List of Elements:

Tetrahedra 10 15 3 11  
Tetrahedra 10 15 11 26  
Tetrahedra 8 10 11 26  
Tetrahedra 6 15 10 26  
Tetrahedra 11 15 19 26  
Tetrahedra 6 7 15 19  
Tetrahedra 6 19 15 26  
Tetrahedra 6 10 2 26  
Prism 0 8 11 4 16 19  
Pyramid 8 11 19 16 26  
Tetrahedra 6 16 19 26  
Pyramid 1 2 10 8 26  
Tetrahedra 5 16 6 26  
Pyramid 8 16 5 1 26  
Pyramid 1 5 6 2 26



Aspect Ratio:  
0.639766

Jacobian Ratio: 1

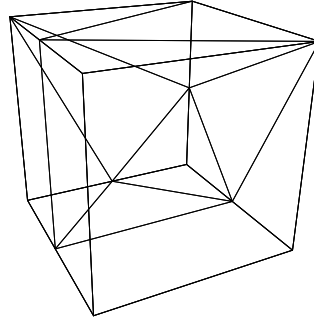
## Pattern 283

### Node index:

8 10 11 15 16 26

### List of Elements:

Tetrahedra 10 15 3 11  
Tetrahedra 10 15 11 26  
Tetrahedra 4 11 15 26  
Tetrahedra 6 15 10 26  
Tetrahedra 8 10 11 26  
Tetrahedra 0 8 11 26  
Tetrahedra 0 11 4 26  
Pyramid 0 4 16 8 26  
Pyramid 1 2 10 8 26  
Pyramid 8 16 5 1 26  
Tetrahedra 2 6 10 26  
Tetrahedra 6 7 15 26  
Tetrahedra 4 15 7 26  
Tetrahedra 4 7 16 26  
Tetrahedra 6 16 7 26  
Tetrahedra 5 16 6 26  
Pyramid 1 5 6 2 26



Aspect Ratio:  
0.629632

Jacobian Ratio: 1

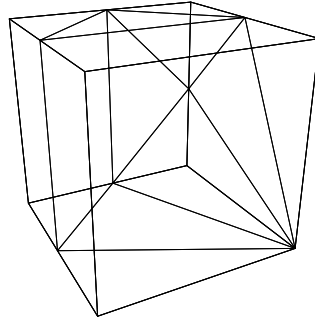
## Pattern 284

### Node index:

8 11 15 16 18 19 26

### List of Elements:

Tetrahedra 15 18 7 19  
Tetrahedra 2 3 11 15  
Tetrahedra 2 15 11 26  
Tetrahedra 11 15 19 26  
Tetrahedra 2 18 15 26  
Tetrahedra 15 18 19 26  
Tetrahedra 2 11 8 26  
Tetrahedra 2 6 18 26  
Tetrahedra 1 2 8 26  
Prism 0 8 11 4 16 19  
Pyramid 8 11 19 16 26  
Tetrahedra 16 19 18 26  
Pyramid 5 16 18 6 26  
Pyramid 1 8 16 5 26  
Pyramid 1 5 6 2 26



Aspect Ratio:  
0.639766

Jacobian Ratio: 1

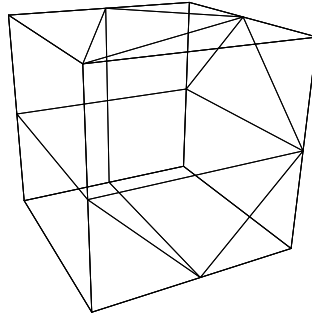
## Pattern 285

### Node index:

9 11 12 13 14 15 18 19 24 26

### List of Elements:

Pyramid 0 11 24 12 26  
Pyramid 12 24 19 4 26  
Pyramid 11 3 15 24 26  
Pyramid 24 15 7 19 26  
Pyramid 0 1 9 11 26  
Pyramid 11 9 2 3 26  
Pyramid 2 14 15 3 26  
Pyramid 0 12 13 1 26  
Pyramid 12 4 5 13 26  
Tetrahedra 1 13 9 26  
Tetrahedra 13 14 9 26  
Tetrahedra 9 14 2 26  
Tetrahedra 15 18 7 26  
Tetrahedra 14 18 15 26  
Tetrahedra 6 18 14 26  
Tetrahedra 4 19 5 26  
Tetrahedra 5 19 18 26  
Tetrahedra 7 18 19 26  
Tetrahedra 5 18 6 26  
Pyramid 13 5 6 14 26



Aspect Ratio:

0.626916

Jacobian Ratio: 1

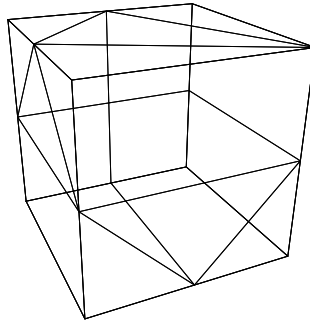
## Pattern 286

### Node index:

9 11 12 13 14 15 16 19 24 26

### List of Elements:

Pyramid 0 11 24 12 26  
Pyramid 11 3 15 24 26  
Pyramid 24 15 7 19 26  
Pyramid 12 24 19 4 26  
Pyramid 0 1 9 11 26  
Pyramid 2 3 11 9 26  
Pyramid 0 12 13 1 26  
Pyramid 2 14 15 3 26  
Pyramid 14 6 7 15 26  
Tetrahedra 1 13 9 26  
Tetrahedra 13 14 9 26  
Tetrahedra 2 9 14 26  
Tetrahedra 4 16 12 26  
Tetrahedra 13 12 16 26  
Tetrahedra 13 16 5 26  
Tetrahedra 6 19 7 26  
Tetrahedra 6 16 19 26  
Tetrahedra 5 16 6 26  
Tetrahedra 4 19 16 26  
Pyramid 13 5 6 14 26



Aspect Ratio:

0.626916

Jacobian Ratio: 1

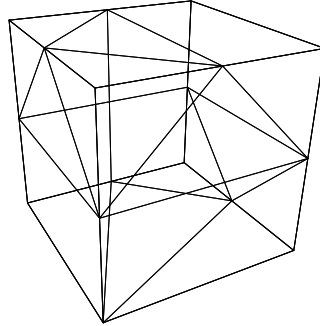
## Pattern 287

### Node index:

10 11 12 13 14 15 16 17 19 24 26

### List of Elements:

Pyramid 0 11 24 12 26  
Pyramid 11 3 15 24 26  
Pyramid 24 15 7 19 26  
Pyramid 12 24 19 4 26  
Tetrahedra 3 11 10 26  
Tetrahedra 3 10 15 26  
Tetrahedra 10 14 15 26  
Tetrahedra 2 14 10 26  
Tetrahedra 0 1 11 26  
Tetrahedra 1 10 11 26  
Tetrahedra 1 2 10 26  
Pyramid 0 12 13 1 26  
Pyramid 1 13 14 2 26  
Pyramid 14 6 7 15 26  
Pyramid 6 17 19 7 26  
Tetrahedra 6 14 17 26  
Tetrahedra 13 17 14 26  
Tetrahedra 12 4 16 26  
Tetrahedra 4 19 16 26  
Tetrahedra 16 19 17 26  
Tetrahedra 12 16 13 26  
Tetrahedra 13 16 17 26  
Tetrahedra 5 17 13 16



Aspect Ratio:  
0.672256

Jacobian Ratio: 1



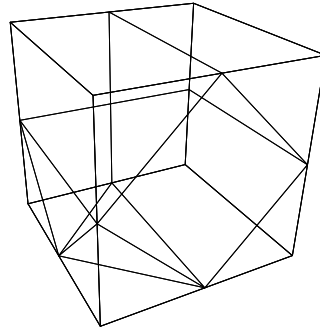
## Pattern 288

### Node index:

8 9 11 12 13 14 15 17 19 24 26

### List of Elements:

Pyramid 0 11 24 12 26  
Pyramid 11 3 15 24 26  
Pyramid 24 15 7 19 26  
Pyramid 12 24 19 4 26  
Pyramid 2 14 15 3 26  
Pyramid 14 6 7 15 26  
Pyramid 2 3 11 9 26  
Pyramid 4 19 17 5 26  
Pyramid 6 17 19 7 26  
Tetrahedra 0 8 11 26  
Tetrahedra 0 12 8 26  
Tetrahedra 8 9 11 26  
Tetrahedra 12 13 8 26  
Tetrahedra 8 13 9 26  
Tetrahedra 1 9 8 13  
Pyramid 12 4 5 13 26  
Tetrahedra 5 17 13 26  
Tetrahedra 9 14 2 26  
Tetrahedra 14 17 6 26  
Pyramid 13 17 14 9 26



Aspect Ratio:

0.658686

Jacobian Ratio: 1

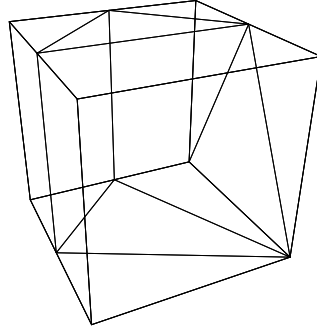
## Pattern 289

### Node index:

8 11 16 18 19 26

### List of Elements:

Prism 0 8 11 4 16 19  
Pyramid 11 3 7 19 26  
Tetrahedra 3 18 7 26  
Tetrahedra 18 19 7 26  
Tetrahedra 2 3 11 26  
Tetrahedra 2 18 3 26  
Tetrahedra 2 6 18 26  
Pyramid 8 11 19 16 26  
Tetrahedra 2 11 8 26  
Tetrahedra 16 19 18 26  
Tetrahedra 1 2 8 26  
Pyramid 8 16 5 1 26  
Pyramid 5 16 18 6 26  
Pyramid 1 5 6 2 26



Aspect Ratio:  
0.567768

Jacobian Ratio: 1

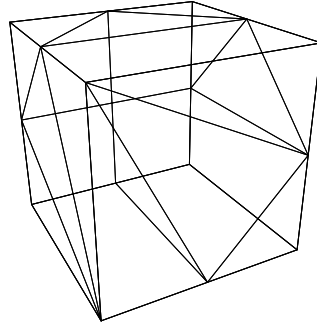
## Pattern 290

### Node index:

9 11 12 14 15 16 18 19 24 26

### List of Elements:

Pyramid 0 11 24 12 26  
Pyramid 11 3 15 24 26  
Pyramid 24 15 7 19 26  
Pyramid 12 24 19 4 26  
Pyramid 0 1 9 11 26  
Pyramid 2 3 11 9 26  
Pyramid 2 14 15 3 26  
Tetrahedra 7 15 18 26  
Tetrahedra 14 18 15 26  
Tetrahedra 6 18 14 26  
Tetrahedra 0 12 1 26  
Tetrahedra 12 4 16 26  
Tetrahedra 1 12 16 26  
Tetrahedra 4 19 16 26  
Tetrahedra 16 19 18 26  
Tetrahedra 18 19 7 26  
Tetrahedra 1 16 5 26  
Tetrahedra 1 5 9 26  
Tetrahedra 9 14 2 26  
Pyramid 5 16 18 6 26  
Tetrahedra 5 6 14 26  
Tetrahedra 5 14 9 26



Aspect Ratio:  
0.633986

Jacobian Ratio: 1

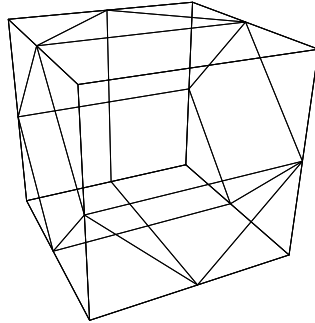
## Pattern 291

### Node index:

8 9 10 11 12 13 14 15 16 18 19 20 24  
26

### List of Elements:

Prism 11 20 24 0 8 12  
Prism 3 10 15 11 20 24  
Pyramid 8 20 24 12 26  
Pyramid 20 10 15 24 26  
Pyramid 1 9 20 8 26  
Pyramid 2 10 20 9 26  
Pyramid 12 24 19 4 26  
Pyramid 24 15 7 19 26  
Tetrahedra 4 16 12 26  
Tetrahedra 4 19 16 26  
Tetrahedra 16 19 18 26  
Tetrahedra 7 18 19 26  
Tetrahedra 15 18 7 26  
Pyramid 12 16 13 8 26  
Pyramid 14 18 15 10 26  
Tetrahedra 1 8 13 26  
Tetrahedra 1 13 9 26  
Tetrahedra 9 13 14 26  
Tetrahedra 9 14 2 26  
Tetrahedra 2 14 10 26  
Pyramid 13 16 18 14 26  
Prism 5 13 16 6 14 18



Aspect Ratio:  
0.667607

Jacobian Ratio: 1

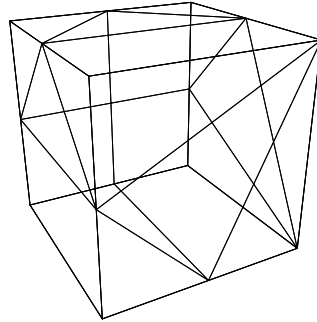
## Pattern 292

### Node index:

9 11 12 13 15 16 18 19 24 26

### List of Elements:

Pyramid 0 11 24 12 26  
Pyramid 11 3 15 24 26  
Pyramid 24 15 7 19 26  
Pyramid 12 24 19 4 26  
Pyramid 1 9 11 0 26  
Pyramid 9 2 3 11 26  
Pyramid 0 12 13 1 26  
Tetrahedra 2 15 3 26  
Tetrahedra 15 18 7 26  
Tetrahedra 2 18 15 26  
Tetrahedra 13 16 5 26  
Tetrahedra 12 16 13 26  
Tetrahedra 12 4 16 26  
Tetrahedra 4 19 16 26  
Tetrahedra 16 19 18 26  
Tetrahedra 7 18 19 26  
Tetrahedra 2 6 18 26  
Tetrahedra 2 9 6 26  
Tetrahedra 1 13 9 26  
Tetrahedra 9 13 6 26  
Tetrahedra 5 6 13 26  
Pyramid 5 16 18 6 26



Aspect Ratio:  
0.633986

Jacobian Ratio: 1

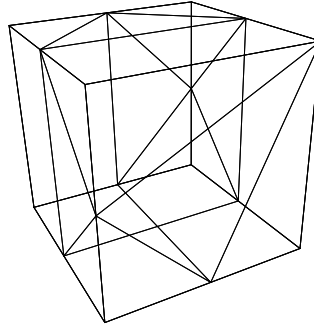
## Pattern 293

### Node index:

8 9 10 11 13 15 16 18 19 20 26

### List of Elements:

Pyramid 1 9 20 8 26  
Pyramid 9 2 10 20 26  
Pyramid 20 10 3 11 26  
Pyramid 8 20 11 0 26  
Tetrahedra 3 15 11 26  
Tetrahedra 10 15 3 26  
Tetrahedra 11 15 19 26  
Pyramid 0 11 19 4 26  
Tetrahedra 15 18 7 19  
Tetrahedra 15 18 19 26  
Tetrahedra 10 18 15 26  
Pyramid 2 6 18 10 26  
Tetrahedra 4 19 16 26  
Pyramid 0 4 16 8 26  
Tetrahedra 16 19 18 26  
Tetrahedra 1 8 13 26  
Tetrahedra 8 16 13 26  
Tetrahedra 13 16 5 26  
Pyramid 5 16 18 6 26  
Tetrahedra 1 13 9 26  
Tetrahedra 9 6 2 26  
Tetrahedra 13 6 9 26  
Tetrahedra 5 6 13 26



Aspect Ratio:  
0.672256

Jacobian Ratio: 1

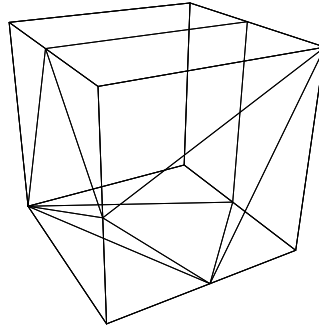
## Pattern 294

### Node index:

9 10 13 16 18 26

### List of Elements:

Pyramid 0 3 7 4 26  
Tetrahedra 0 10 3 26  
Pyramid 10 18 7 3 26  
Tetrahedra 0 4 16 26  
Pyramid 16 4 7 18 26  
Tetrahedra 0 9 10 26  
Tetrahedra 0 1 9 13  
Tetrahedra 9 0 13 26  
Tetrahedra 0 16 13 26  
Tetrahedra 9 2 10 26  
Tetrahedra 13 16 5 26  
Pyramid 2 6 18 10 26  
Tetrahedra 9 6 2 26  
Tetrahedra 9 13 6 26  
Tetrahedra 5 6 13 26  
Pyramid 5 16 18 6 26



Aspect Ratio:  
0.585455

Jacobian Ratio: 1

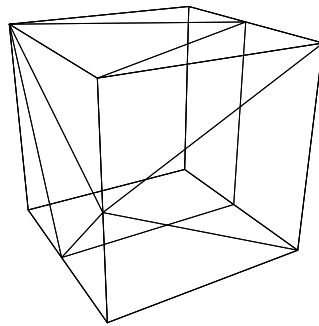
## Pattern 295

### Node index:

8 10 13 18 26

### List of Elements:

Pyramid 0 3 7 4 26  
Pyramid 0 8 10 3 26  
Pyramid 1 2 10 8 26  
Pyramid 2 6 18 10 26  
Pyramid 10 18 7 3 26  
Tetrahedra 0 4 8 26  
Tetrahedra 4 13 8 26  
Tetrahedra 4 5 13 26  
Tetrahedra 1 8 13 26  
Tetrahedra 4 7 18 26  
Tetrahedra 4 18 5 26  
Tetrahedra 5 18 6 26  
Tetrahedra 1 13 2 26  
Tetrahedra 2 13 6 26  
Tetrahedra 5 6 13 26



Aspect Ratio:  
0.579676

Jacobian Ratio: 1

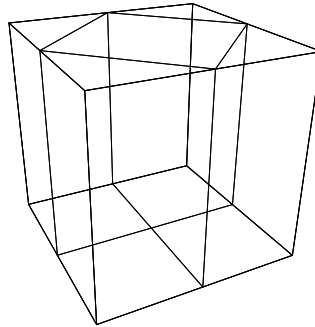
## Pattern 296

**Node index:**

8 9 10 11 16 17 18 19 20 26

**List of Elements:**

Pyramid 1 9 20 8 26  
Pyramid 9 2 10 20 26  
Pyramid 20 10 3 11 26  
Pyramid 8 20 11 0 26  
Pyramid 3 7 19 11 26  
Pyramid 0 11 19 4 26  
Pyramid 2 6 18 10 26  
Pyramid 10 18 7 3 26  
Pyramid 1 8 16 5 26  
Pyramid 0 4 16 8 26  
Tetrahedra 4 19 16 26  
Tetrahedra 7 18 19 26  
Tetrahedra 5 16 17 26  
Tetrahedra 6 17 18 26  
Pyramid 16 19 18 17 26  
Pyramid 1 5 17 9 26  
Pyramid 9 17 6 2 26



Aspect Ratio:  
0.60295

Jacobian Ratio: 1

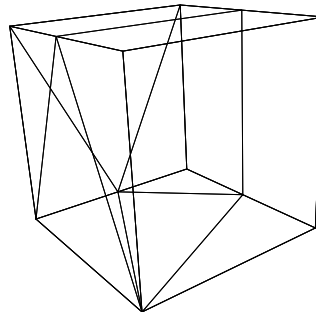
## Pattern 297

**Node index:**

10 11 16 18 26

**List of Elements:**

Tetrahedra 3 11 10 26  
Tetrahedra 1 10 11 26  
Tetrahedra 3 7 11 26  
Tetrahedra 4 11 7 26  
Tetrahedra 1 2 10 26  
Pyramid 2 6 18 10 26  
Pyramid 10 18 7 3 26  
Tetrahedra 0 11 4 26  
Tetrahedra 0 1 11 26  
Tetrahedra 0 4 16 26  
Tetrahedra 0 16 1 26  
Tetrahedra 1 16 5 26  
Pyramid 16 4 7 18 26  
Pyramid 5 16 18 6 26  
Pyramid 1 5 6 2 26



Aspect Ratio:  
0.579676

Jacobian Ratio: 1

## Pattern 298

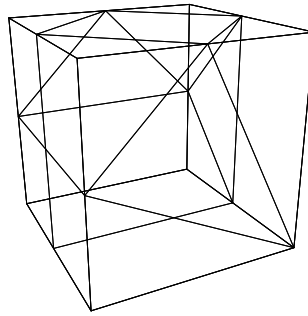


**Node index:**

8 10 12 13 15 16 17 18 19 21 26

**List of Elements:**

Pyramid 0 3 15 12 26  
Pyramid 0 8 10 3 26  
Tetrahedra 10 15 3 26  
Pyramid 1 2 10 8 26  
Tetrahedra 7 18 19 15  
Tetrahedra 10 18 15 26  
Tetrahedra 12 15 19 26  
Tetrahedra 15 18 19 26  
Tetrahedra 4 12 19 26  
Pyramid 0 12 21 8 26  
Pyramid 1 8 21 13 26  
Pyramid 13 21 16 5 26  
Pyramid 21 12 4 16 26  
Tetrahedra 4 19 16 26  
Pyramid 2 6 18 10 26  
Tetrahedra 1 13 2 26  
Tetrahedra 17 18 6 26  
Tetrahedra 2 17 6 26  
Tetrahedra 2 13 17 26  
Tetrahedra 5 17 13 26  
Tetrahedra 5 16 17 26  
Pyramid 16 19 18 17 26



Aspect Ratio:  
0.662868

Jacobian Ratio: 1

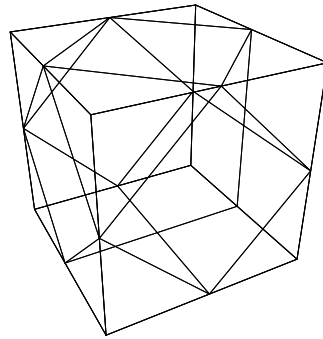
## Pattern 299

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 20  
23 26

### List of Elements:

Prism 20 10 23 9 2 14  
Prism 11 3 15 20 10 23  
Pyramid 20 9 14 23 26  
Pyramid 11 20 23 15 26  
Pyramid 12 11 15 19 26  
Tetrahedra 4 16 12 19  
Tetrahedra 12 19 16 26  
Tetrahedra 15 7 19 26  
Tetrahedra 0 11 12 26  
Pyramid 1 9 20 8 26  
Pyramid 8 20 11 0 26  
Tetrahedra 0 12 8 26  
Tetrahedra 1 8 13 26  
Pyramid 7 15 23 18 26  
Pyramid 6 18 23 14 26  
Tetrahedra 7 18 19 26  
Tetrahedra 6 17 18 26  
Tetrahedra 14 17 6 26  
Tetrahedra 1 13 9 26  
Pyramid 8 12 16 13 26  
Pyramid 16 19 18 17 26  
Pyramid 13 17 14 9 26  
Tetrahedra 13 16 17 26  
Tetrahedra 13 17 16 5



Aspect Ratio:  
0.716624

Jacobian Ratio: 1

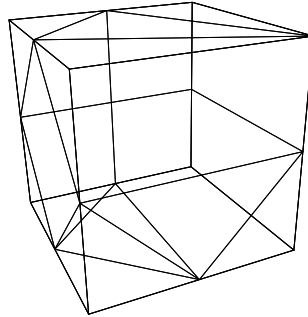
## Pattern 300

### Node index:

8 9 11 12 13 14 15 16 19 24 26

### List of Elements:

Pyramid 0 11 24 12 26  
Pyramid 11 3 15 24 26  
Pyramid 24 15 7 19 26  
Pyramid 12 24 19 4 26  
Tetrahedra 0 8 11 26  
Tetrahedra 8 9 11 26  
Tetrahedra 8 13 9 26  
Tetrahedra 1 9 8 13  
Tetrahedra 0 12 8 26  
Pyramid 2 3 11 9 26  
Pyramid 2 14 15 3 26  
Pyramid 14 6 7 15 26  
Tetrahedra 13 14 9 26  
Tetrahedra 2 9 14 26  
Tetrahedra 6 19 7 26  
Tetrahedra 4 16 12 26  
Tetrahedra 4 19 16 26  
Tetrahedra 6 16 19 26  
Pyramid 8 12 16 13 26  
Tetrahedra 5 13 16 26  
Tetrahedra 5 16 6 26  
Pyramid 13 5 6 14 26



Aspect Ratio:  
0.662868

Jacobian Ratio: 1

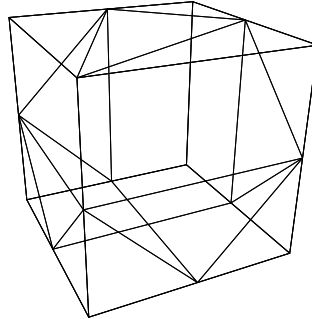
## Pattern 301

### Node index:

8 9 10 11 12 13 14 18 19 20 26

### List of Elements:

Pyramid 3 7 19 11 26  
Tetrahedra 11 19 12 26  
Pyramid 0 8 20 11 12  
Pyramid 3 11 20 10 26  
Pyramid 3 10 18 7 26  
Tetrahedra 7 18 19 26  
Tetrahedra 11 12 20 26  
Tetrahedra 8 12 13 20  
Tetrahedra 12 13 20 26  
Pyramid 8 1 9 20 13  
Tetrahedra 4 12 19 26  
Pyramid 12 4 5 13 26  
Tetrahedra 4 19 5 26  
Tetrahedra 5 19 18 26  
Tetrahedra 10 14 18 26  
Tetrahedra 14 6 18 26  
Tetrahedra 5 18 6 26  
Tetrahedra 20 14 10 26  
Pyramid 2 10 20 9 14  
Tetrahedra 20 14 13 9  
Tetrahedra 20 13 14 26  
Pyramid 13 5 6 14 26



Aspect Ratio:  
0.654466

Jacobian Ratio: 1

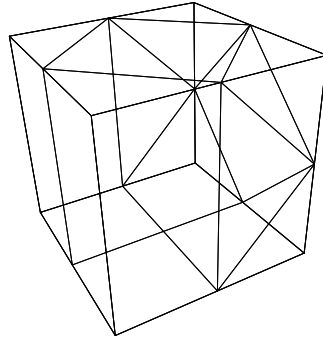
## Pattern 302

### Node index:

8 9 10 11 14 15 16 17 18 19 20 26

### List of Elements:

Tetrahedra 3 15 11 26  
Tetrahedra 10 15 3 26  
Tetrahedra 11 15 19 26  
Pyramid 0 11 19 4 26  
Pyramid 1 9 20 8 26  
Pyramid 9 2 10 20 26  
Pyramid 20 10 3 11 26  
Pyramid 0 8 20 11 26  
Pyramid 10 14 18 15 26  
Tetrahedra 18 19 7 15  
Tetrahedra 15 18 19 26  
Tetrahedra 2 14 10 26  
Tetrahedra 2 9 14 26  
Tetrahedra 6 17 18 14  
Tetrahedra 14 17 18 26  
Tetrahedra 9 17 14 26  
Pyramid 0 4 16 8 26  
Pyramid 1 8 16 5 26  
Tetrahedra 4 19 16 26  
Pyramid 16 19 18 17 26  
Tetrahedra 5 16 17 26  
Pyramid 1 5 17 9 26



Aspect Ratio:  
0.691751

Jacobian Ratio: 1

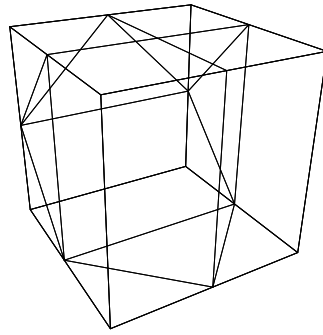
## Pattern 303

### Node index:

8 9 10 12 15 16 17 18 19 25 26

### List of Elements:

Pyramid 4 19 25 16 12  
Pyramid 7 18 25 19 15  
Tetrahedra 12 25 15 19  
Prism 12 8 0 15 10 3  
Pyramid 12 8 10 15 26  
Tetrahedra 12 26 15 25  
Tetrahedra 8 12 16 26  
Tetrahedra 12 26 25 16  
Tetrahedra 10 18 15 26  
Tetrahedra 18 26 25 15  
Tetrahedra 8 9 10 26  
Tetrahedra 1 9 8 26  
Tetrahedra 9 2 10 26  
Pyramid 5 16 25 17 26  
Pyramid 17 25 18 6 26  
Pyramid 8 16 5 1 26  
Pyramid 1 5 17 9 26  
Pyramid 9 17 6 2 26  
Pyramid 2 6 18 10 26



Aspect Ratio:  
0.634681

Jacobian Ratio: 1

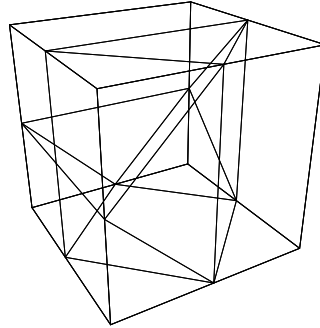
## Pattern 304

### Node index:

8 9 10 11 12 13 15 16 17 18 21 26

### List of Elements:

Tetrahedra 11 15 12 26  
Tetrahedra 3 11 10 15  
Tetrahedra 15 11 10 26  
Tetrahedra 10 18 15 26  
Tetrahedra 7 15 18 26  
Pyramid 4 12 15 7 26  
Pyramid 8 9 10 11 26  
Tetrahedra 0 11 12 26  
Tetrahedra 0 8 11 26  
Pyramid 12 21 8 0 26  
Pyramid 4 16 21 12 26  
Pyramid 16 4 7 18 26  
Tetrahedra 18 17 16 26  
Pyramid 9 17 18 10 26  
Tetrahedra 1 9 8 26  
Tetrahedra 1 13 9 26  
Tetrahedra 9 13 17 26  
Tetrahedra 5 17 13 26  
Tetrahedra 5 16 17 26  
Pyramid 1 8 21 13 26  
Pyramid 13 21 16 5 26  
Prism 9 2 10 17 6 18



Aspect Ratio:  
0.670531

Jacobian Ratio: 1

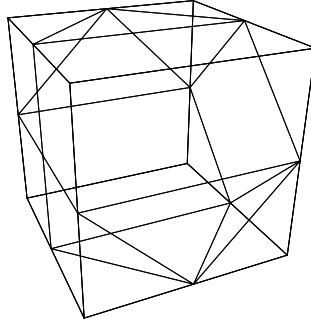
## Pattern 305

### Node index:

8 9 10 12 13 14 15 16 18 19 21 26

### List of Elements:

Pyramid 0 3 15 12 26  
Pyramid 0 8 10 3 26  
Tetrahedra 12 26 15 19  
Tetrahedra 3 10 15 26  
Tetrahedra 19 7 18 15  
Pyramid 15 10 14 18 26  
Tetrahedra 15 18 19 26  
Tetrahedra 18 14 6 26  
Tetrahedra 4 12 19 26  
Tetrahedra 16 4 19 26  
Tetrahedra 16 19 18 26  
Pyramid 12 4 16 21 26  
Pyramid 0 12 21 8 26  
Tetrahedra 8 9 10 26  
Tetrahedra 9 2 10 14  
Tetrahedra 9 14 10 26  
Tetrahedra 1 9 8 26  
Pyramid 8 21 13 1 26  
Pyramid 21 16 5 13 26  
Tetrahedra 1 13 9 26  
Tetrahedra 13 14 9 26  
Pyramid 5 16 18 6 26  
Pyramid 13 5 6 14 26



Aspect Ratio:  
0.699882

Jacobian Ratio: 1



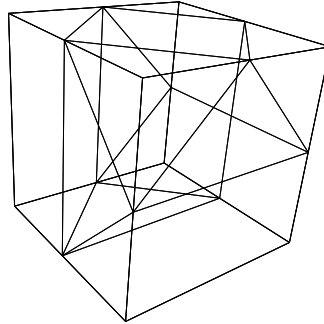
## Pattern 306

### Node index:

8 9 10 12 13 15 16 17 18 19 21 26

### List of Elements:

Pyramid 0 3 15 12 26  
Pyramid 0 8 10 3 26  
Tetrahedra 3 10 15 26  
Pyramid 0 12 21 8 26  
Tetrahedra 12 15 19 26  
Tetrahedra 19 7 18 15  
Tetrahedra 10 18 15 26  
Tetrahedra 19 18 26 15  
Tetrahedra 4 12 19 26  
Pyramid 12 4 16 21 26  
Tetrahedra 16 4 19 26  
Tetrahedra 8 9 10 26  
Tetrahedra 1 9 8 26  
Pyramid 8 21 13 1 26  
Pyramid 21 16 5 13 26  
Tetrahedra 1 13 9 26  
Pyramid 9 17 18 10 26  
Tetrahedra 9 13 17 26  
Prism 9 2 10 17 6 18  
Pyramid 19 18 17 16 26  
Tetrahedra 5 16 17 26  
Tetrahedra 13 5 17 26



Aspect Ratio:  
0.670531

Jacobian Ratio: 1

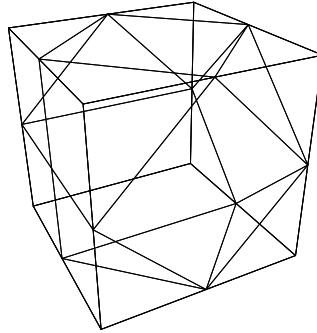
## Pattern 307

### Node index:

8 9 10 12 13 14 15 16 17 18 19 21 26

### List of Elements:

Pyramid 0 3 15 12 26  
Pyramid 0 8 10 3 26  
Tetrahedra 15 3 10 26  
Pyramid 0 12 21 8 26  
Tetrahedra 8 9 10 26  
Tetrahedra 8 1 9 26  
Pyramid 8 21 13 1 26  
Tetrahedra 1 13 9 26  
Tetrahedra 9 2 10 14  
Tetrahedra 9 14 10 26  
Tetrahedra 12 15 19 26  
Tetrahedra 19 4 12 26  
Pyramid 12 4 16 21 26  
Pyramid 21 16 5 13 26  
Tetrahedra 19 7 18 15  
Tetrahedra 19 15 18 26  
Tetrahedra 16 4 19 26  
Pyramid 15 10 14 18 26  
Tetrahedra 18 6 17 14  
Tetrahedra 14 17 18 26  
Pyramid 19 18 17 16 26  
Pyramid 13 17 14 9 26  
Tetrahedra 13 5 17 26  
Tetrahedra 5 16 17 26



Aspect Ratio:  
0.719305

Jacobian Ratio: 1

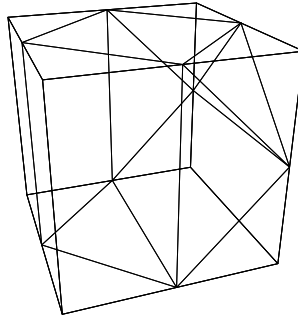
## Pattern 308

### Node index:

8 9 11 14 15 16 17 18 19 26

### List of Elements:

Prism 11 3 15 9 2 14  
Pyramid 11 9 14 15 26  
Tetrahedra 11 15 19 26  
Tetrahedra 11 8 9 26  
Prism 11 0 8 19 4 16  
Pyramid 19 16 8 11 26  
Tetrahedra 14 18 15 26  
Tetrahedra 18 19 7 15  
Tetrahedra 18 19 15 26  
Tetrahedra 17 18 6 14  
Tetrahedra 14 17 18 26  
Tetrahedra 17 14 9 26  
Pyramid 19 18 17 16 26  
Pyramid 9 8 16 17 26  
Prism 8 1 9 16 5 17



Aspect Ratio:  
0.665092

Jacobian Ratio: 1

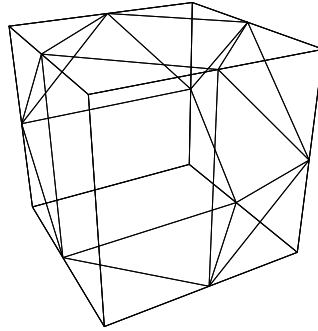
## Pattern 309

### Node index:

8 9 10 12 14 15 16 17 18 19 26

### List of Elements:

Prism 15 3 10 12 0 8  
Pyramid 12 8 10 15 26  
Tetrahedra 15 19 12 26  
Tetrahedra 18 19 7 15  
Tetrahedra 16 4 19 12  
Tetrahedra 12 26 19 16  
Tetrahedra 8 12 16 26  
Pyramid 10 14 18 15 26  
Tetrahedra 15 26 18 19  
Tetrahedra 8 9 10 26  
Tetrahedra 9 2 10 14  
Tetrahedra 9 14 10 26  
Tetrahedra 26 14 18 17  
Tetrahedra 17 18 6 14  
Tetrahedra 17 14 9 26  
Pyramid 19 18 17 16 26  
Pyramid 9 8 16 17 26  
Prism 8 1 9 16 5 17



Aspect Ratio:  
0.742599

Jacobian Ratio: 1

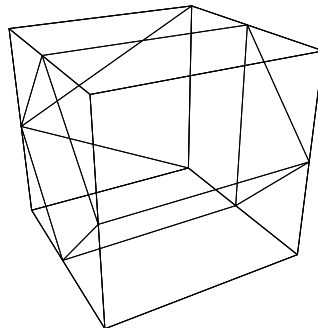
## Pattern 310

### Node index:

8 10 12 13 14 16 18 26

### List of Elements:

Tetrahedra 7 12 3 26  
Tetrahedra 12 0 3 26  
Pyramid 3 10 18 7 26  
Pyramid 0 8 10 3 26  
Tetrahedra 8 0 12 26  
Tetrahedra 10 14 18 26  
Pyramid 8 13 14 10 26  
Prism 10 2 14 8 1 13  
Tetrahedra 7 4 12 26  
Pyramid 4 7 18 16 26  
Tetrahedra 12 4 16 26  
Pyramid 16 13 8 12 26  
Pyramid 13 16 18 14 26  
Prism 14 6 18 13 5 16



Aspect Ratio:  
0.552754

Jacobian Ratio: 1

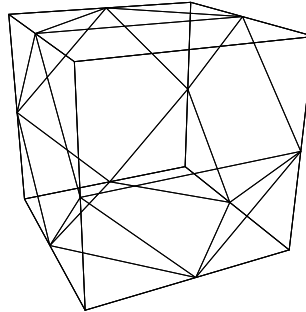
## Pattern 311

**Node index:**

8 9 10 11 12 13 14 15 16 18 19 26

**List of Elements:**

Tetrahedra 11 0 8 12  
Tetrahedra 10 3 11 15  
Tetrahedra 18 19 7 15  
Tetrahedra 16 4 19 12  
Tetrahedra 9 2 10 14  
Tetrahedra 15 11 10 26  
Pyramid 8 9 10 11 26  
Pyramid 10 14 18 15 26  
Tetrahedra 26 9 10 14  
Pyramid 19 12 11 15 26  
Tetrahedra 8 1 9 13  
Tetrahedra 8 13 9 26  
Tetrahedra 19 18 26 15  
Tetrahedra 8 12 26 11  
Tetrahedra 12 26 19 16  
Tetrahedra 16 19 18 26  
Tetrahedra 13 14 9 26  
Pyramid 12 16 13 8 26  
Pyramid 14 13 16 18 26  
Prism 14 6 18 13 5 16



Aspect Ratio:  
0.79392

Jacobian Ratio: 1

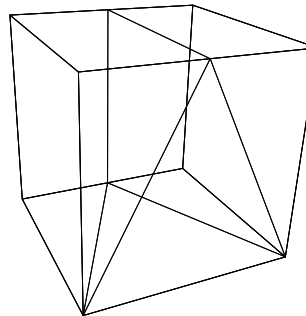
### Pattern 312

**Node index:**

11 17 19 26

**List of Elements:**

Tetrahedra 17 2 1 26  
Tetrahedra 17 6 2 26  
Tetrahedra 1 5 17 26  
Tetrahedra 0 1 11 26  
Tetrahedra 2 3 11 26  
Tetrahedra 1 2 11 26  
Pyramid 3 7 19 11 26  
Pyramid 11 19 4 0 26  
Pyramid 4 5 1 0 26  
Pyramid 6 7 3 2 26  
Pyramid 19 17 5 4 26  
Pyramid 19 7 6 17 26



Aspect Ratio:  
0.565479

Jacobian Ratio: 1

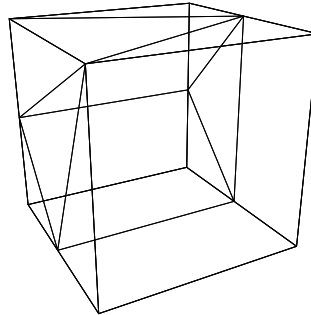
### Pattern 313

**Node index:**

8 10 12 15 18 26

**List of Elements:**

Tetrahedra 1 5 26 8  
Tetrahedra 26 5 6 18  
Tetrahedra 26 10 15 18  
Tetrahedra 12 8 26 5  
Tetrahedra 12 5 26 4  
Tetrahedra 4 5 26 18  
Tetrahedra 4 26 7 18  
Tetrahedra 7 26 15 18  
Pyramid 10 2 6 18 26  
Pyramid 8 1 2 10 26  
Pyramid 1 5 6 2 26  
Pyramid 4 12 15 7 26  
Pyramid 12 8 10 15 26  
Prism 0 12 8 3 15 10



Aspect Ratio:  
0.567768

Jacobian Ratio: 1

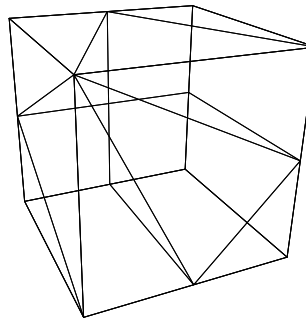
### Pattern 314

**Node index:**

9 11 12 14 15 19 24 26

**List of Elements:**

Tetrahedra 2 9 14 26  
Tetrahedra 7 26 6 19  
Tetrahedra 26 9 14 5  
Tetrahedra 19 6 5 26  
Tetrahedra 6 14 5 26  
Tetrahedra 1 5 9 26  
Tetrahedra 4 26 19 5  
Tetrahedra 0 1 26 12  
Tetrahedra 4 12 26 5  
Tetrahedra 12 1 26 5  
Pyramid 3 2 14 15 26  
Pyramid 11 9 2 3 26  
Pyramid 24 11 3 15 26  
Pyramid 19 24 15 7 26  
Pyramid 15 14 6 7 26  
Pyramid 0 1 9 11 26  
Pyramid 4 12 24 19 26  
Pyramid 12 0 11 24 26



Aspect Ratio:  
0.636729

Jacobian Ratio: 1

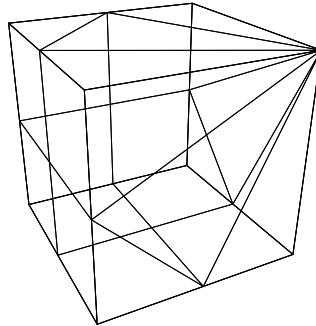
### Pattern 315

**Node index:**

8 9 10 11 12 13 15 16 19 20 21 24 26

**List of Elements:**

Tetrahedra 16 19 6 26  
Tetrahedra 4 26 19 16  
Tetrahedra 1 13 9 26  
Tetrahedra 5 16 6 26  
Tetrahedra 6 9 13 26  
Tetrahedra 13 5 6 26  
Tetrahedra 7 19 26 6  
Tetrahedra 3 10 15 26  
Tetrahedra 10 6 15 26  
Tetrahedra 15 6 7 26  
Tetrahedra 10 26 2 6  
Tetrahedra 9 6 2 26  
Pyramid 0 8 20 11 26  
Pyramid 12 21 8 0 26  
Pyramid 12 0 11 24 26  
Pyramid 4 12 24 19 26  
Pyramid 4 16 21 12 26  
Pyramid 8 1 9 20 26  
Pyramid 13 1 8 21 26  
Pyramid 5 13 21 16 26  
Pyramid 11 20 10 3 26  
Pyramid 24 11 3 15 26  
Pyramid 19 24 15 7 26  
Pyramid 20 9 2 10 26



Aspect Ratio:  
0.709421

Jacobian Ratio: 1

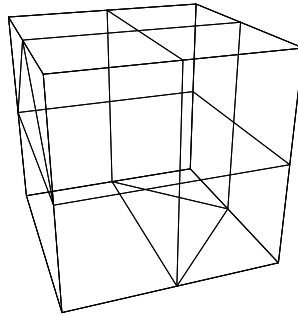
## Pattern 316

### Node index:

9 10 11 12 13 14 15 16 17 18 19 22 23  
24 25 26

### List of Elements:

Tetrahedra 12 16 13 26  
Tetrahedra 16 5 13 26  
Tetrahedra 4 16 12 26  
Tetrahedra 11 9 10 26  
Tetrahedra 10 9 2 26  
Tetrahedra 3 11 10 26  
Pyramid 12 13 1 0 26  
Pyramid 0 1 9 11 26  
Pyramid 13 22 9 1 26  
Pyramid 5 17 22 13 26  
Pyramid 16 25 17 5 26  
Pyramid 19 25 16 4 26  
Pyramid 4 12 24 19 26  
Pyramid 0 11 24 12 26  
Pyramid 22 14 2 9 26  
Pyramid 10 2 14 23 26  
Pyramid 17 6 14 22 26  
Pyramid 6 18 23 14 26  
Pyramid 18 6 17 25 26  
Pyramid 23 15 3 10 26  
Pyramid 15 24 11 3 26  
Pyramid 18 7 15 23 26  
Pyramid 15 7 19 24 26  
Pyramid 19 7 18 25 26



Aspect Ratio:  
0.746954

Jacobian Ratio: 1



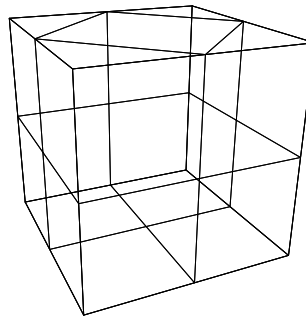
## Pattern 317

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 20  
21 22 23 24 26

### List of Elements:

Pyramid 21 13 1 8 26  
Pyramid 21 16 5 13 26  
Pyramid 12 21 8 0 26  
Pyramid 4 16 21 12 26  
Pyramid 0 8 20 11 26  
Pyramid 8 1 9 20 26  
Pyramid 20 9 2 10 26  
Pyramid 11 20 10 3 26  
Pyramid 12 24 19 4 26  
Pyramid 24 15 7 19 26  
Pyramid 15 24 11 3 26  
Pyramid 0 11 24 12 26  
Pyramid 14 23 10 2 26  
Pyramid 6 18 23 14 26  
Pyramid 23 15 3 10 26  
Pyramid 18 7 15 23 26  
Pyramid 13 22 9 1 26  
Pyramid 22 14 2 9 26  
Pyramid 5 17 22 13 26  
Pyramid 17 6 14 22 26  
Pyramid 19 18 17 16 26  
Tetrahedra 19 16 4 26  
Tetrahedra 5 16 17 26  
Tetrahedra 6 17 18 26  
Tetrahedra 7 18 19 26



Aspect Ratio:  
0.772564

Jacobian Ratio: 1

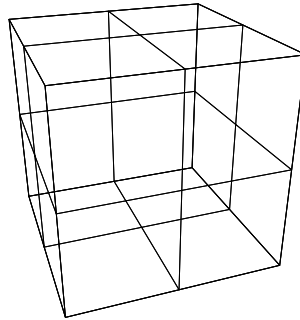
## Pattern 318

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 20  
21 22 23 24 25 26

### List of Elements:

Hexaedra 0 8 20 11 12 21 26 24  
Hexaedra 8 1 9 20 21 13 22 26  
Hexaedra 12 21 26 24 4 16 25 19  
Hexaedra 21 13 22 26 16 5 17 25  
Hexaedra 11 20 10 3 24 26 23 15  
Hexaedra 24 26 23 15 19 25 18 7  
Hexaedra 20 9 2 10 26 22 14 23  
Hexaedra 26 22 14 23 25 17 6 18



Aspect Ratio:  
1

Jacobian Ratio: 1

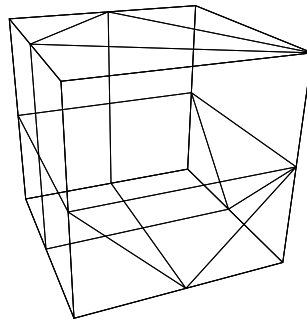
## Pattern 319

### Node index:

8 9 10 11 12 13 14 15 16 19 20 21 24  
26

### List of Elements:

Pyramid 1 8 21 13 26  
Pyramid 9 20 8 1 26  
Tetrahedra 13 9 1 26  
Pyramid 2 10 20 9 14  
Tetrahedra 26 14 9 20  
Tetrahedra 9 13 14 26  
Tetrahedra 26 20 10 14  
Pyramid 3 11 20 10 26  
Pyramid 15 24 11 3 26  
Tetrahedra 15 3 10 26  
Tetrahedra 10 14 15 26  
Pyramid 12 21 8 0 26  
Pyramid 0 8 20 11 26  
Pyramid 0 11 24 12 26  
Pyramid 6 7 15 14 26  
Pyramid 7 19 24 15 26  
Tetrahedra 19 7 6 26  
Pyramid 4 12 24 19 26  
Tetrahedra 19 16 4 26  
Pyramid 16 21 12 4 26  
Tetrahedra 16 19 6 26  
Pyramid 5 13 21 16 26  
Tetrahedra 16 6 5 26  
Pyramid 5 6 14 13 26



Aspect Ratio:  
0.711262

Jacobian Ratio: 1

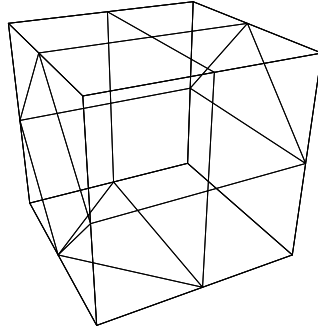
## Pattern 320

### Node index:

8 9 11 12 13 14 15 16 17 18 19 22 24  
25 26

### List of Elements:

Pyramid 0 11 24 12 8  
Pyramid 3 15 24 11 26  
Prism 19 24 25 4 12 16  
Prism 7 15 18 19 24 25  
Tetrahedra 26 24 11 8  
Pyramid 2 3 11 9 26  
Tetrahedra 8 9 11 26  
Pyramid 14 15 3 2 26  
Pyramid 9 22 14 2 26  
Tetrahedra 26 22 13 8  
Tetrahedra 9 22 26 8  
Tetrahedra 12 24 26 8  
Pyramid 13 22 9 1 8  
Pyramid 12 24 25 16 26  
Pyramid 15 18 25 24 26  
Tetrahedra 18 15 14 26  
Pyramid 22 25 18 14 26  
Pyramid 13 16 25 22 26  
Pyramid 8 12 16 13 26  
Prism 5 13 16 17 22 25  
Prism 17 22 25 6 14 18



Aspect Ratio:  
0.707773

Jacobian Ratio: 1

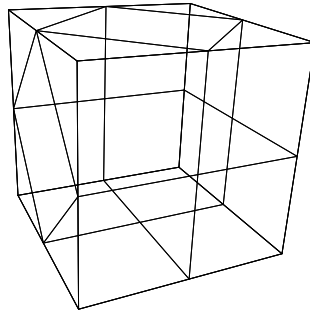
## Pattern 321

### Node index:

8 9 10 11 12 13 14 15 16 17 18 19 20  
22 23 24 26

### List of Elements:

Tetrahedra 1 8 13 26  
Pyramid 9 20 8 1 26  
Pyramid 13 22 9 1 26  
Pyramid 2 9 22 14 26  
Pyramid 10 20 9 2 26  
Pyramid 2 14 23 10 26  
Pyramid 3 10 23 15 26  
Pyramid 3 11 20 10 26  
Pyramid 15 24 11 3 26  
Pyramid 0 11 24 12 26  
Pyramid 0 8 20 11 26  
Tetrahedra 12 8 0 26  
Pyramid 12 24 19 4 16  
Tetrahedra 26 12 16 24  
Tetrahedra 16 19 26 24  
Pyramid 15 23 18 7 26  
Pyramid 7 19 24 15 26  
Tetrahedra 7 18 19 26  
Pyramid 6 18 23 14 26  
Pyramid 6 14 22 17 26  
Tetrahedra 6 17 18 26  
Tetrahedra 26 22 17 16  
Tetrahedra 13 22 26 16  
Pyramid 5 17 22 13 16  
Pyramid 12 16 13 8 26  
Pyramid 19 18 17 16 26



Aspect Ratio:  
0.732011

Jacobian Ratio: 1

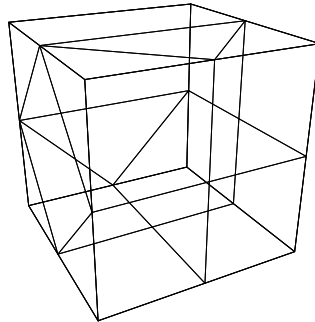
## Pattern 322

### Node index:

8 9 10 11 12 13 14 15 16 17 18 20 22  
23 26

### List of Elements:

Pyramid 0 8 20 11 12  
Pyramid 15 23 18 7 26  
Tetrahedra 11 3 15 26  
Pyramid 11 20 10 3 26  
Pyramid 3 10 23 15 26  
Tetrahedra 15 12 11 26  
Pyramid 12 15 7 4 26  
Tetrahedra 11 20 26 12  
Tetrahedra 26 20 8 12  
Pyramid 2 9 22 14 26  
Pyramid 10 20 9 2 26  
Pyramid 2 14 23 10 26  
Pyramid 18 23 14 6 26  
Pyramid 6 14 22 17 26  
Tetrahedra 6 17 18 26  
Pyramid 7 18 16 4 26  
Tetrahedra 18 17 16 26  
Pyramid 1 9 20 8 26  
Pyramid 13 22 9 1 26  
Tetrahedra 1 8 13 26  
Pyramid 17 22 13 5 16  
Pyramid 8 12 16 13 26  
Tetrahedra 16 12 4 26  
Tetrahedra 13 22 26 16  
Tetrahedra 26 22 17 16



Aspect Ratio:  
0.705803

Jacobian Ratio: 1

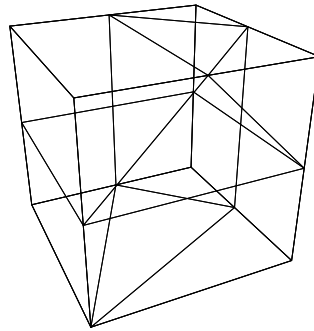
## Pattern 323

### Node index:

10 11 12 13 14 15 17 18 19 23 24 26

### List of Elements:

Pyramid 13 14 2 1 26  
Tetrahedra 1 2 10 26  
Pyramid 2 14 23 10 26  
Tetrahedra 10 11 1 26  
Pyramid 6 18 23 14 26  
Pyramid 11 10 23 24 26  
Pyramid 24 23 18 19 26  
Tetrahedra 6 14 17 26  
Tetrahedra 17 18 6 26  
Tetrahedra 17 14 13 26  
Tetrahedra 17 13 5 26  
Tetrahedra 19 18 17 26  
Tetrahedra 11 0 1 26  
Pyramid 1 0 12 13 26  
Pyramid 13 12 4 5 26  
Pyramid 5 4 19 17 26  
Pyramid 12 24 19 4 26  
Pyramid 0 11 24 12 26  
Prism 15 24 23 7 19 18  
Prism 3 11 10 15 24 23



Aspect Ratio:

0.670669

Jacobian Ratio: 1

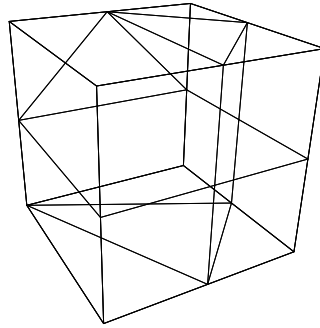
## Pattern 324

### Node index:

9 10 12 13 14 15 17 18 19 22 23 26

### List of Elements:

Pyramid 0 3 15 12 26  
Tetrahedra 10 3 0 26  
Pyramid 10 23 15 3 26  
Tetrahedra 0 9 10 26  
Pyramid 15 23 18 7 26  
Pyramid 22 23 10 9 26  
Pyramid 17 18 23 22 26  
Tetrahedra 19 15 7 26  
Tetrahedra 7 18 19 26  
Tetrahedra 12 15 19 26  
Tetrahedra 4 12 19 26  
Tetrahedra 19 18 17 26  
Tetrahedra 0 1 9 26  
Pyramid 12 13 1 0 26  
Pyramid 4 5 13 12 26  
Pyramid 19 17 5 4 26  
Pyramid 5 17 22 13 26  
Pyramid 13 22 9 1 26  
Prism 6 17 18 14 22 23  
Prism 14 22 23 2 9 10



Aspect Ratio:

0.670669

Jacobian Ratio: 1



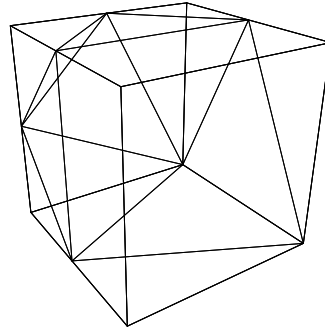
## Pattern 325

### Node index:

8 12 16 18 19 26

### List of Elements:

Tetrahedra 19 16 4 12  
Tetrahedra 18 7 3 19  
Tetrahedra 12 8 0 3  
Tetrahedra 19 12 3 26  
Tetrahedra 3 18 19 26  
Tetrahedra 19 16 12 26  
Tetrahedra 19 18 16 26  
Tetrahedra 18 3 2 26  
Tetrahedra 2 6 18 26  
Tetrahedra 26 3 8 12  
Tetrahedra 2 3 8 26  
Tetrahedra 8 12 16 26  
Tetrahedra 1 2 8 26  
Pyramid 8 16 5 1 26  
Pyramid 16 18 6 5 26  
Pyramid 5 6 2 1 26



Aspect Ratio:  
0.681061

Jacobian Ratio: 1

## 5 Conclusion

In this technical report, we have introduced 325 patterns that allow to manage transitions between coarse and fine regions in a mesh generated with the Octree. In 260 cases, the task of splitting an Octant into mixed-elements following the convention adopted over square faces, was accomplished without adding any new node. In the other 65 cases, it was necessary to add the central node of the original cube to achieve the task.

With respect to quality, these patterns present acceptable values in a stationary state. This is shown in Table 1. However, if the nodes start to be displaced, it is likely these quality values will get worse rapidly. More studies over the quality of these patterns should be performed.

	tetrahedron	pyramid	prism	hexahedron	overall
worst	0.240653	0.353553	0.353553	0.5	0.240653
best	0.999221	1	1	1	1
average	0.612236	0.632454	0.610255	0.643872	0.619641

Table 1: AR quality values for each type of element in all transition patterns.

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