Coding with the Cubeling app

Tasks to use in lessons
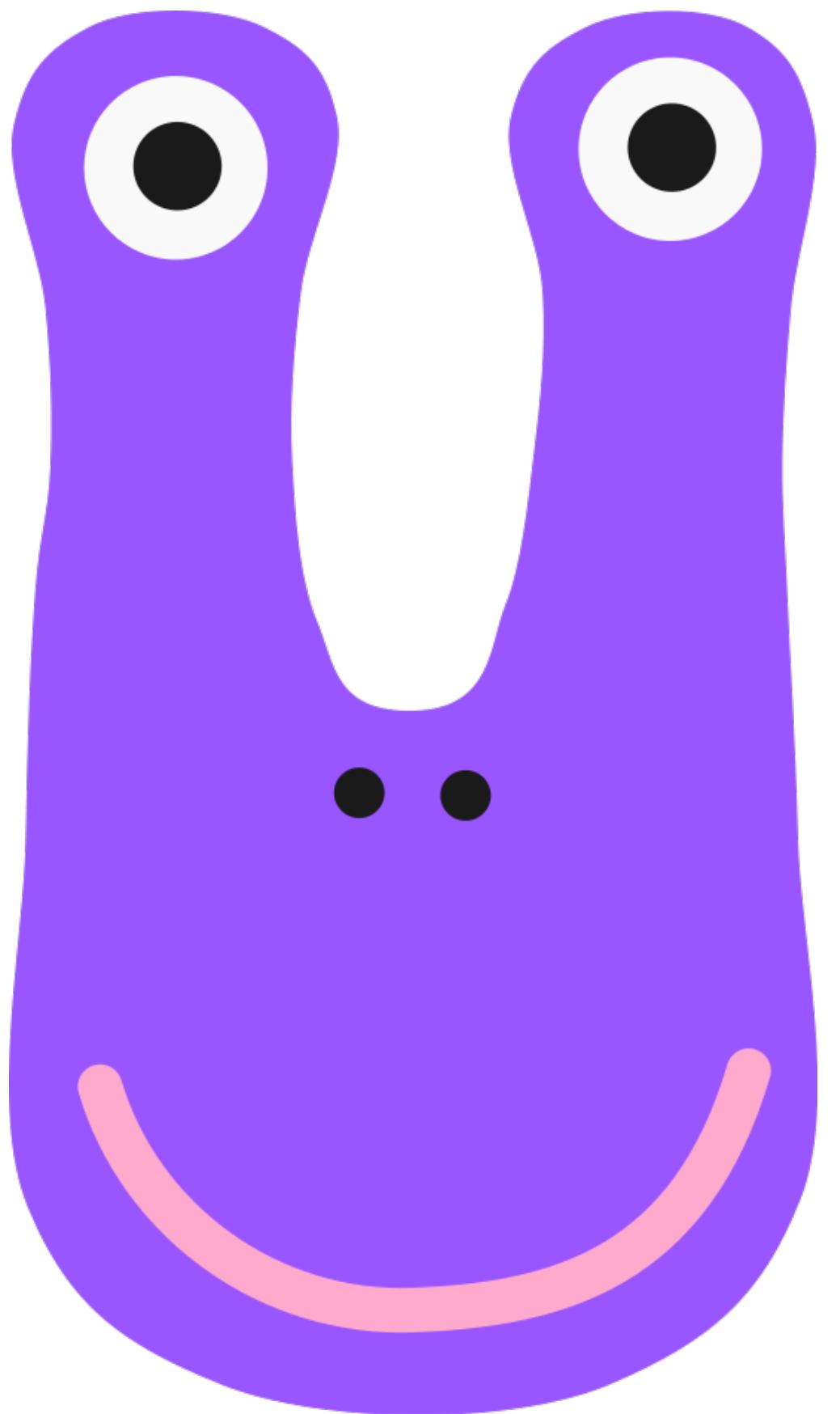
Name tag

Toss a die and do all actions that are assigned to a number less than or equal to the one you rolled:

1) Make yourself a name tag!

2) Write an adjective in fron of your name that begins with the same letter as your first name! dein Vorname!

3) Draw a small picture on your name tag that has something to do with your favorite hobby!

4) Estimate how many cubes each of your classmates would have to take out of the box so that all children have the same number of cubes. Write this number on your name tag!

5) Think about what animal living in the forest you would most like to be and draw or write it on your name tag!

6) Try to recreate this animal using the cubes.

Stefan Janke

The cube

Imagine an alien standing in front of your door tomorrow morning. It has learned your language quickly due to its high intelligence, but it has never come across a shape that is not round. For your new board game, however, you need a cube? Try to explain to the creature what a cube is.
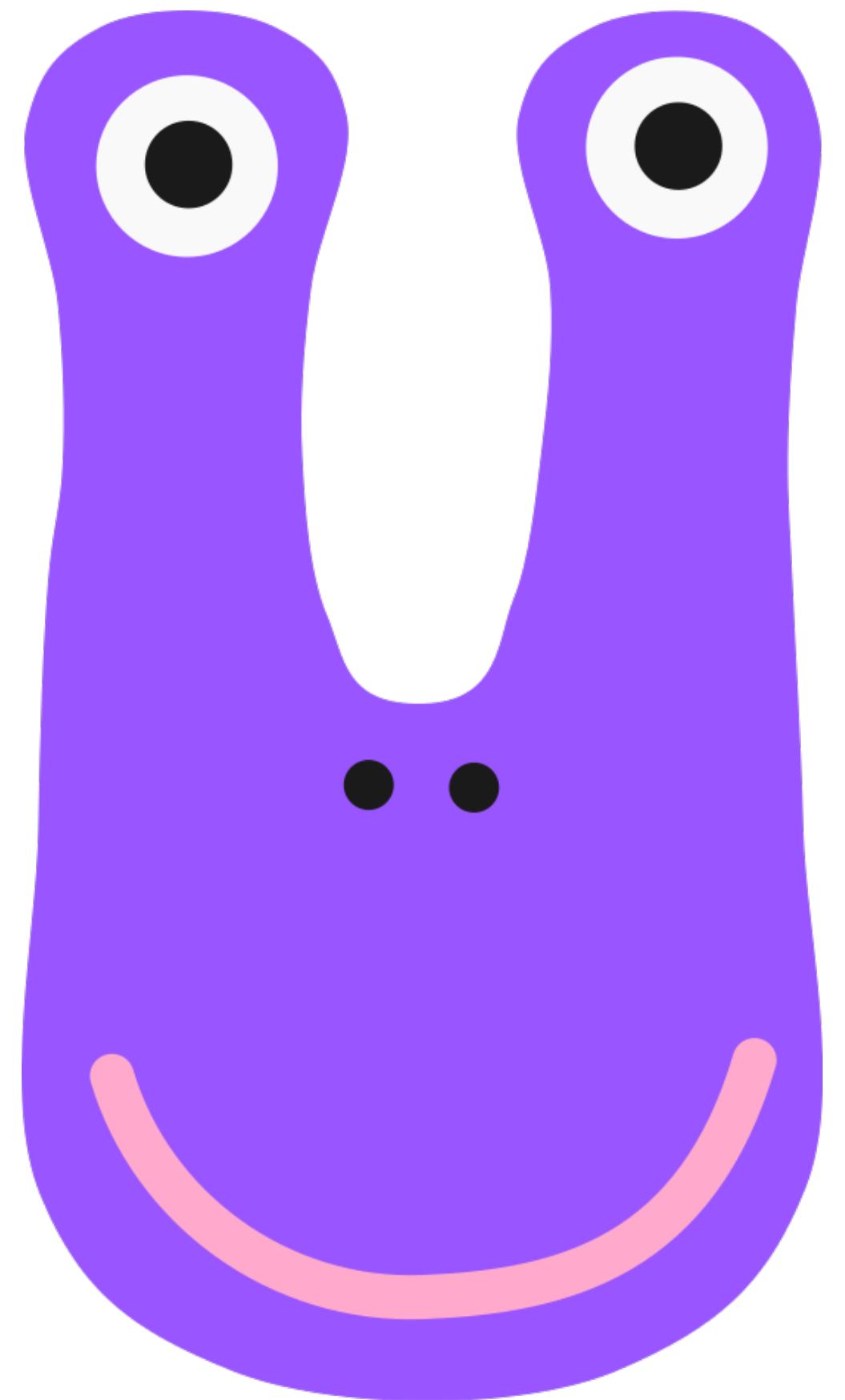
The cube

Act out the situation with the person sitting next to you by pretending to be the alien!

The alien here is completely unknowledgeable and should ask critical questions if it does not understand something.

Afterwards, switch roles.

Connected cube structures

Put a privacy shield between you and the person sitting next to you.

Think of a cube structure with 10 cubes and build it on your side.

Next, explain to your partner how they can build this structure.

Then, compare your cube structures and switch roles.

Connected cube structures

What problems arose when describing the building process of the cube structure?
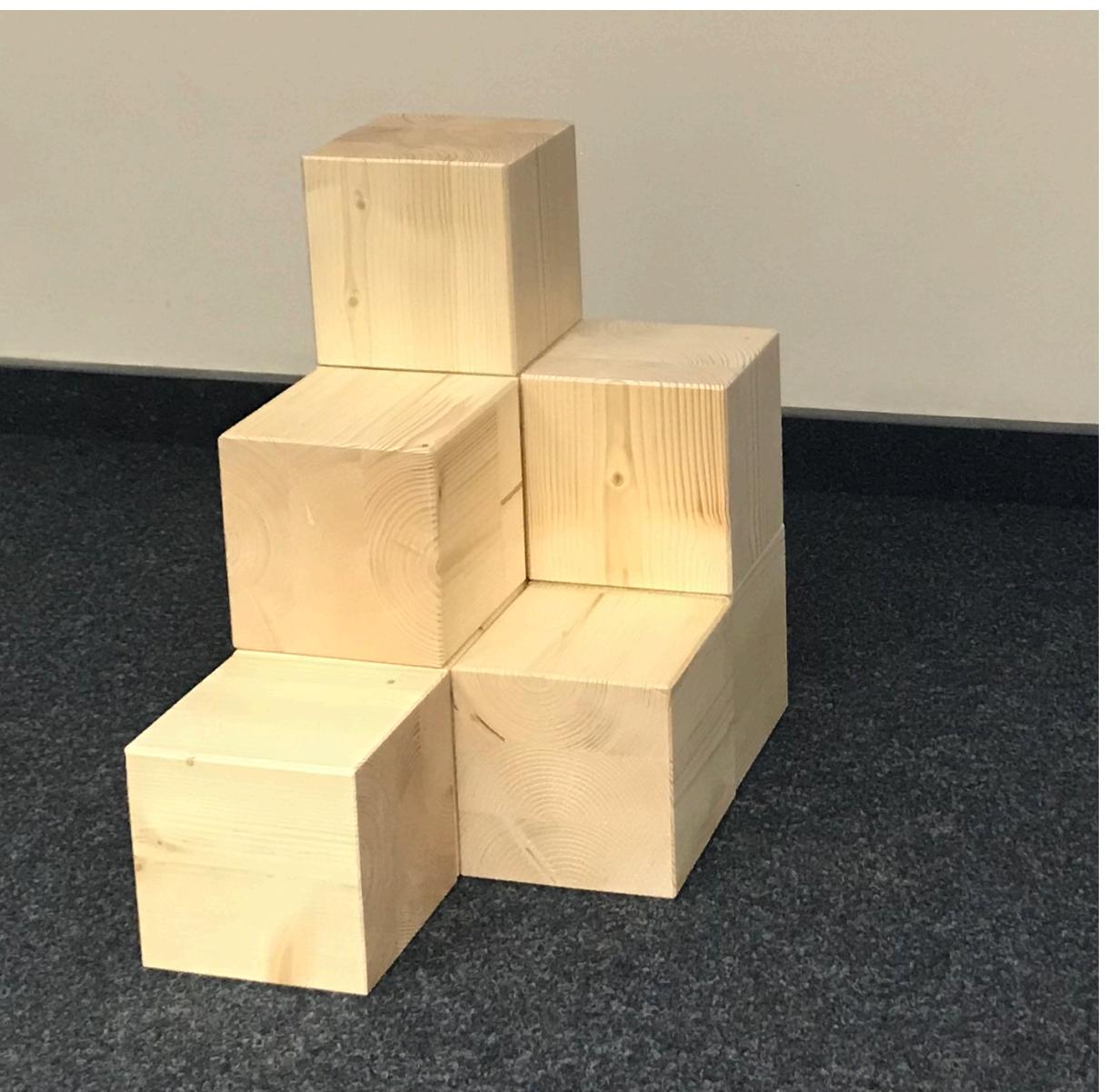
Cubeling app

Imagine you are architects and want to describe a cube structure to a computer so that it can model it. Unambiguity and clarity are of particular importance here.
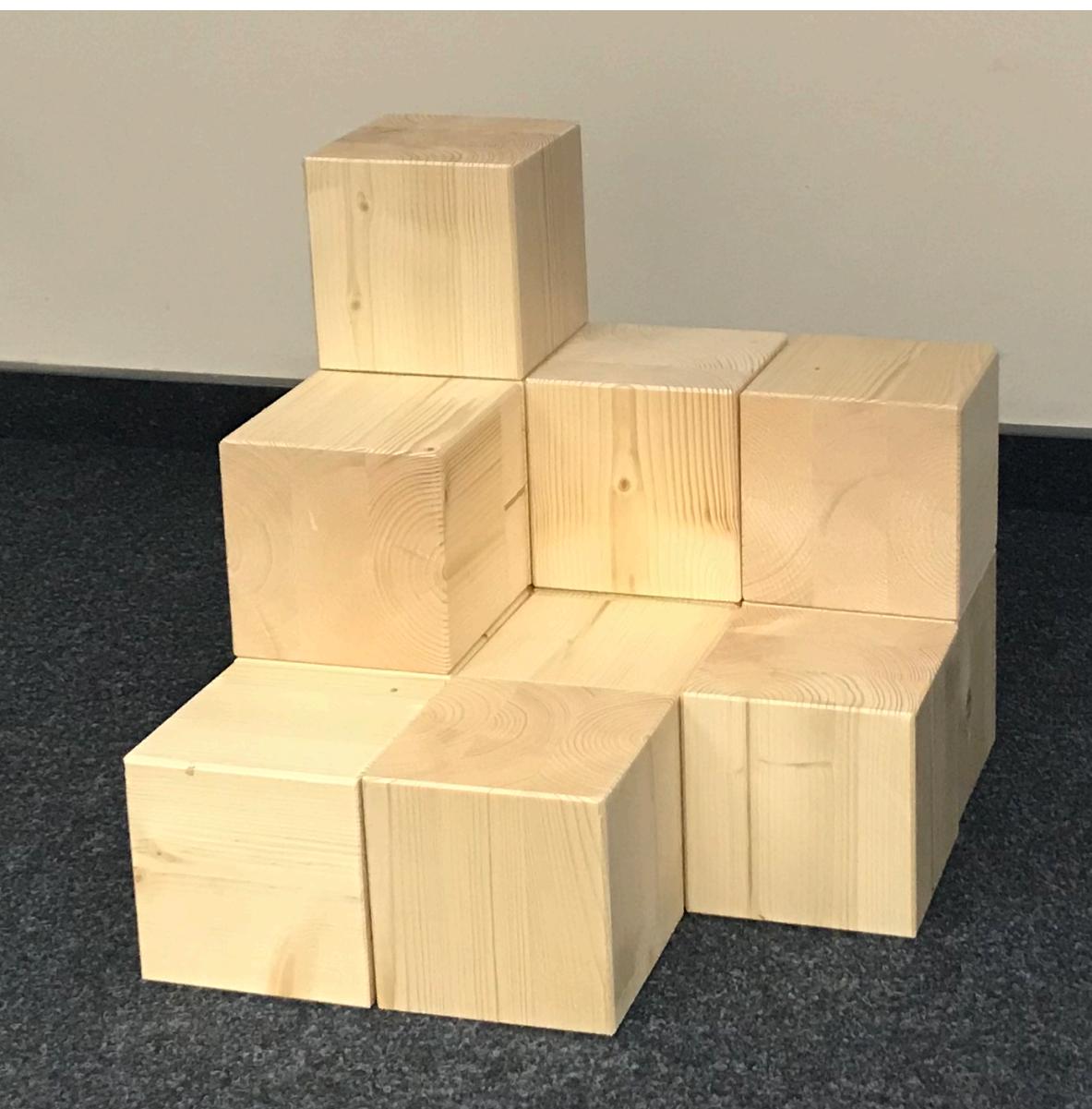
Find out everything the Cubeling app can do.

for task 6

Structure 1

Structure 2

Structure 3

Construction processes

Build this cube structure in the code view!

Construction processes
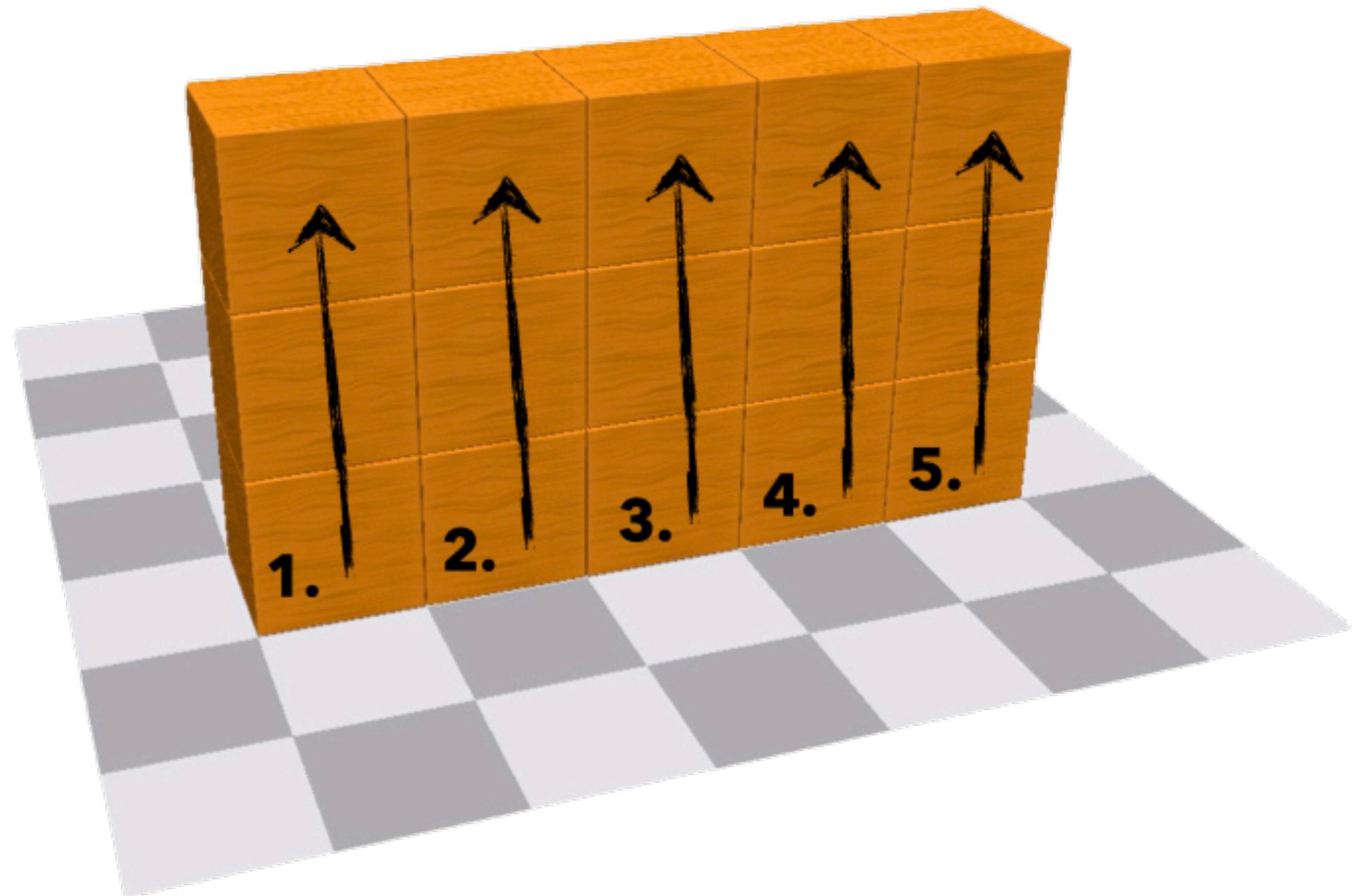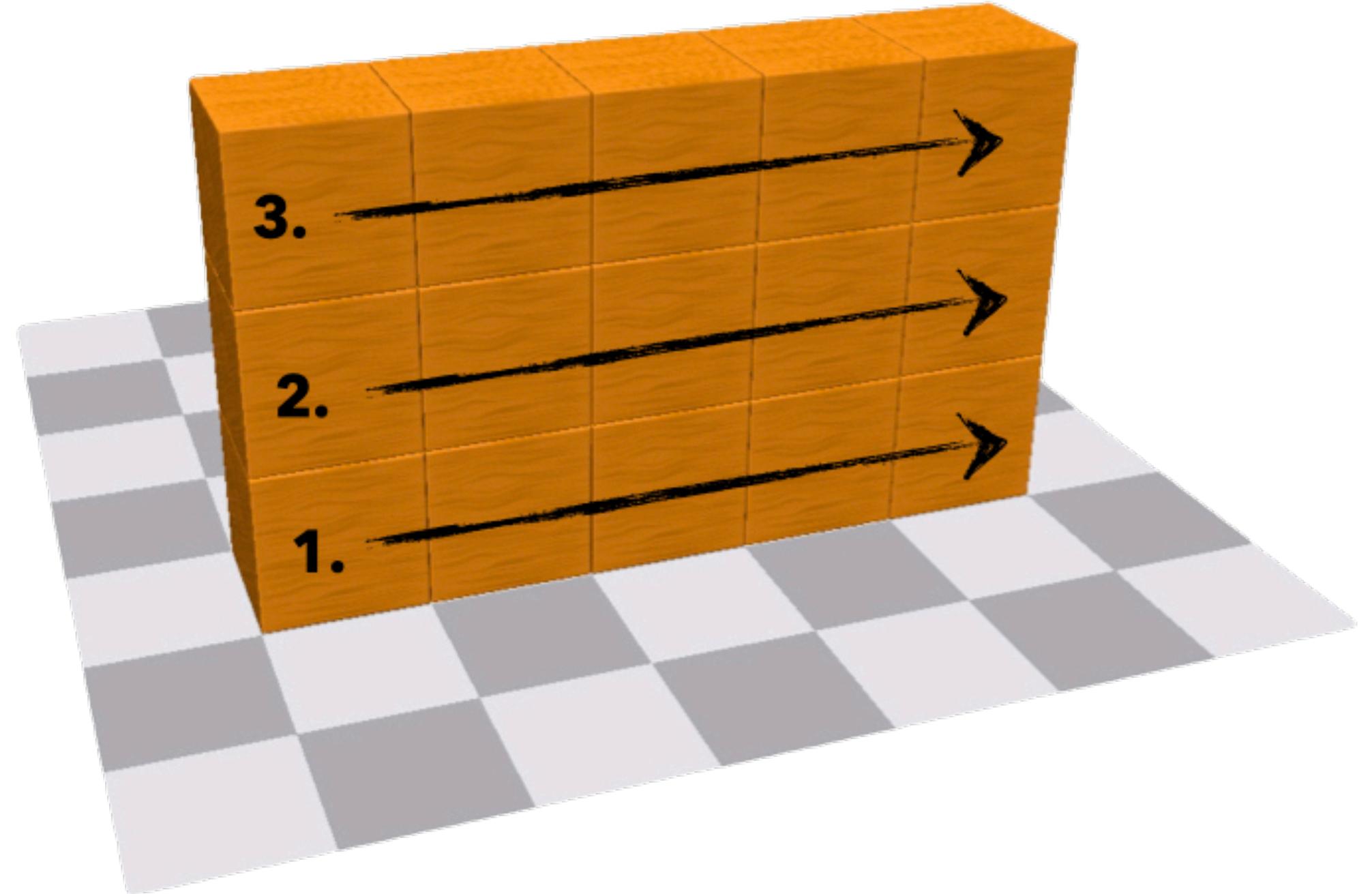
Compare the structure you have created with that of your neighbor.

The following questions can help you:

- Has the same structure been created?

- Does it look like the one on the table at the front?

- Is the structure positioned correctly?

- Can you find a difference in any of the different views?

- Is one structure constructed "better" than the other? What might "better" mean in this context?

Construction processes

Construction processes

Compared to all other views, the code view provides us not only with a <u>unique representation</u> of the cube structure but also with a description of the <u>construction process</u>.

Construction processes

How many different ways are there to build the cube structure without using a remove command?

Can I swap two commands at random, when looking only at the result?

Try to build the structure with exactly 20 commands! Is that even possible?

Which numbers of steps are possible?

Wall construction

Build a wall that is 11 cubes long and 6 cubes high!

Tower construction

Build a bulky 2x2 tower with a height of 30!

Tower construction

```
1 do  30  times{
2   buildCube(at: ( 1 , 1 ))
3   buildCube(at: ( 1 , 2 ))
4   buildCube(at: ( 2 , 1 ))
5   buildCube(at: ( 2 , 2 ))
6 }
```

```
1 do  30  times{
2   buildCube(at: ( 1 , 1 ))
3 }
4 do  30  times{
5   buildCube(at: ( 1 , 2 ))
6 }
7 do  30  times{
8   buildCube(at: ( 2 , 1 ))
9 }
10 do  30  times{
11   buildCube(at: ( 2 , 2 ))
12 }
```

Changing positions

Investigate for yourself what you can do with the commands "position" and "change"!

Changing positions

```
1  positionA = ( 4 , 5 )
2  positionB = ( 1 , 2 )
3  positionC = ( 7 , 7 )
4  positionD = ( 5 , 5 )
5  do  8  times{
6     buildCube(at: positionA)
7  }
8  buildCube(at: positionC)
9  change(positionD, by: ( 2 , 2 ))
10 removeCube(at: positionD)
11 change(positionB, by: ( 3 , 2 ))
12 do  3  times{
13    buildCube(at: positionB)
14    change(positionB, by: ( 0 , -1 ))
15 }
```

Tasks
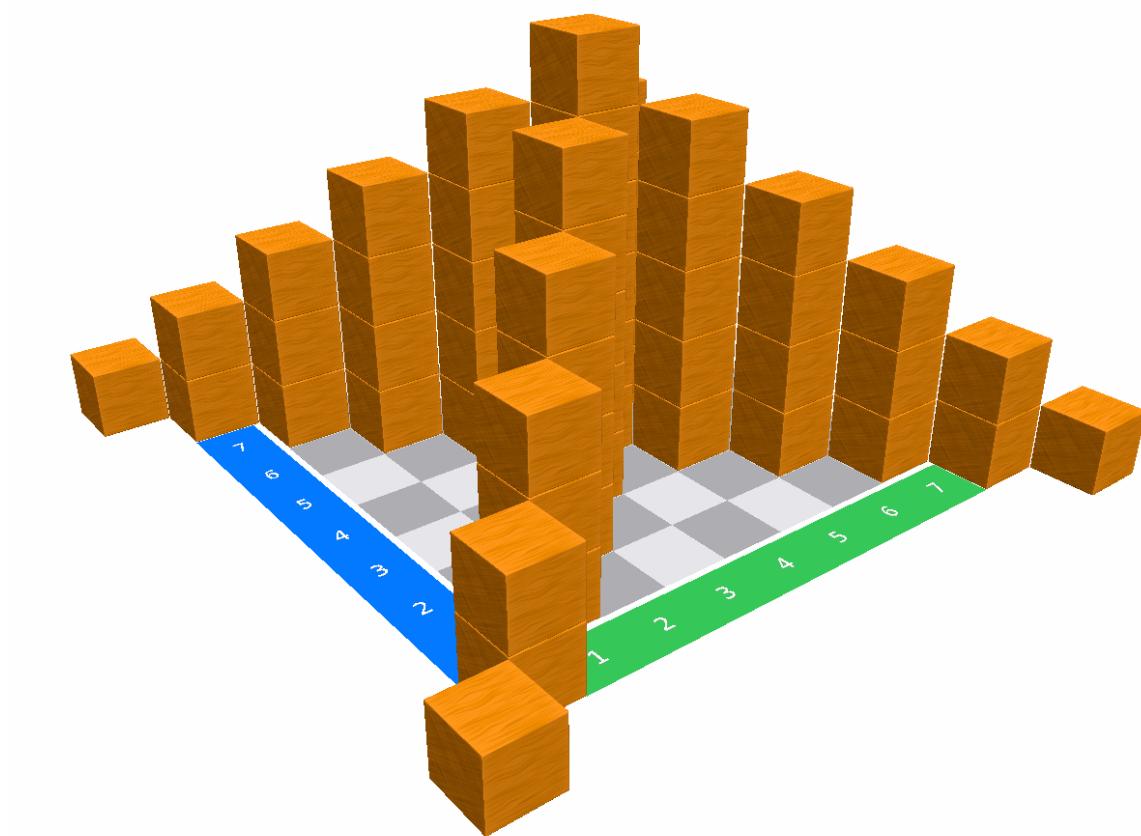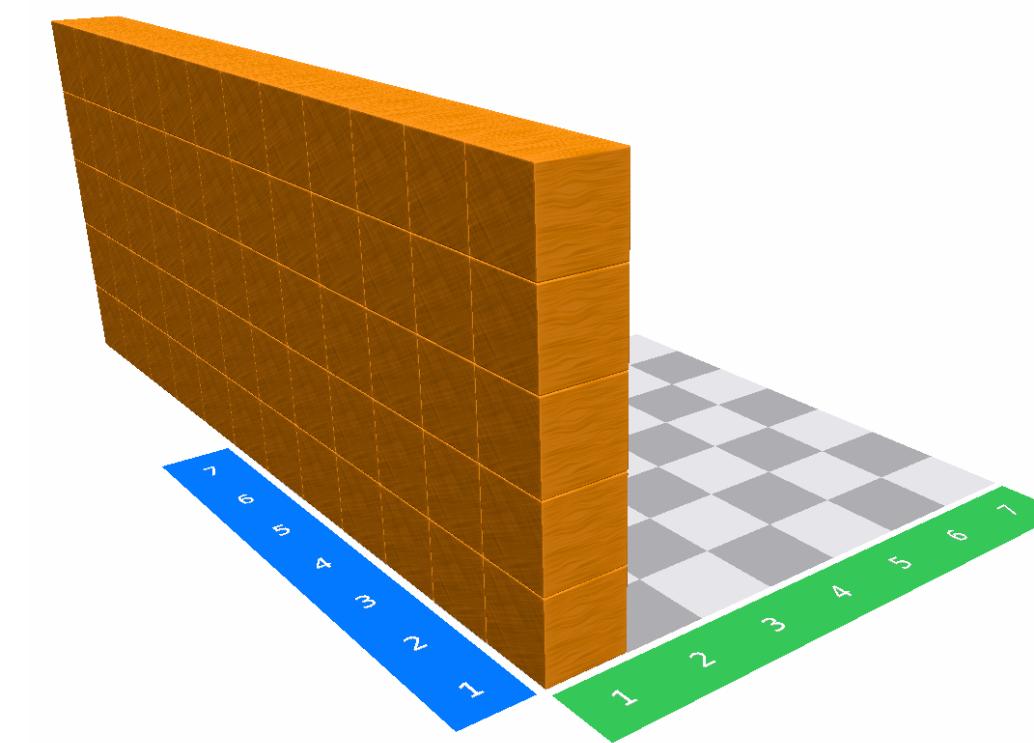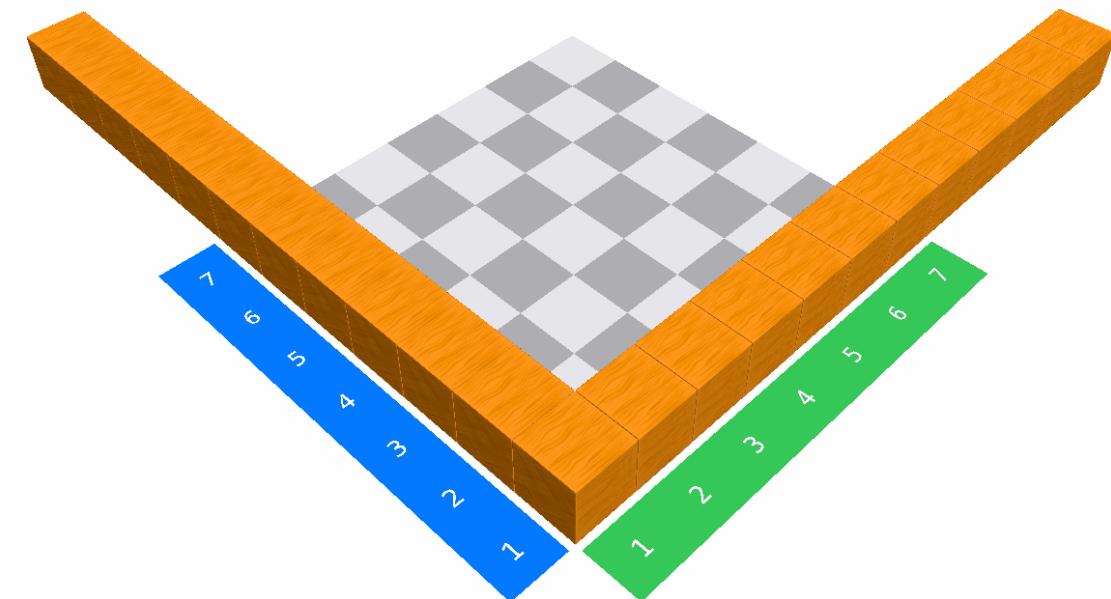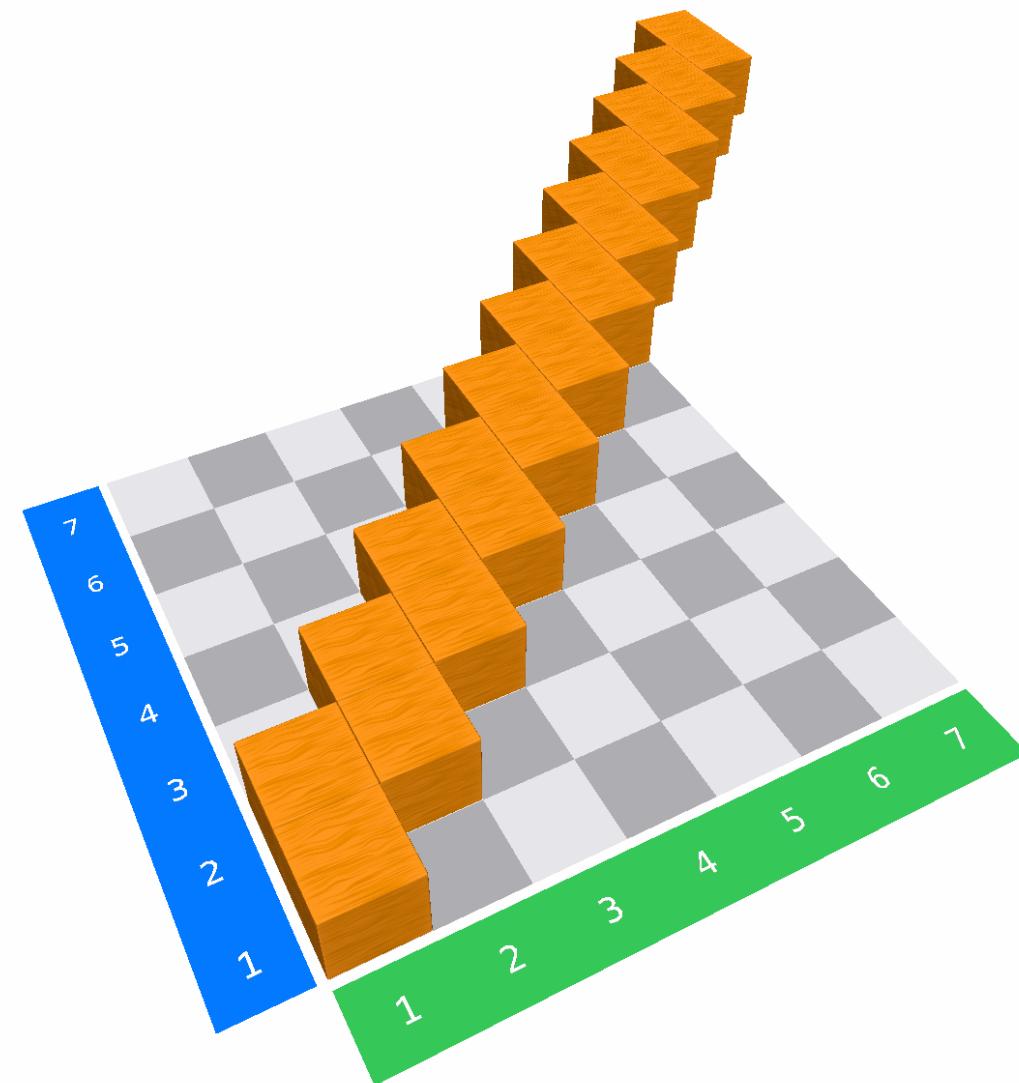
Build a cube on any random square!

From this square, continue building a row of 40 cubes in the following directions:

- to the right
- to the left
- diagonally to the front right
- diagonally to the back left

- to the front
- behind it
- diagonally to the front left
- diagonally to the back right
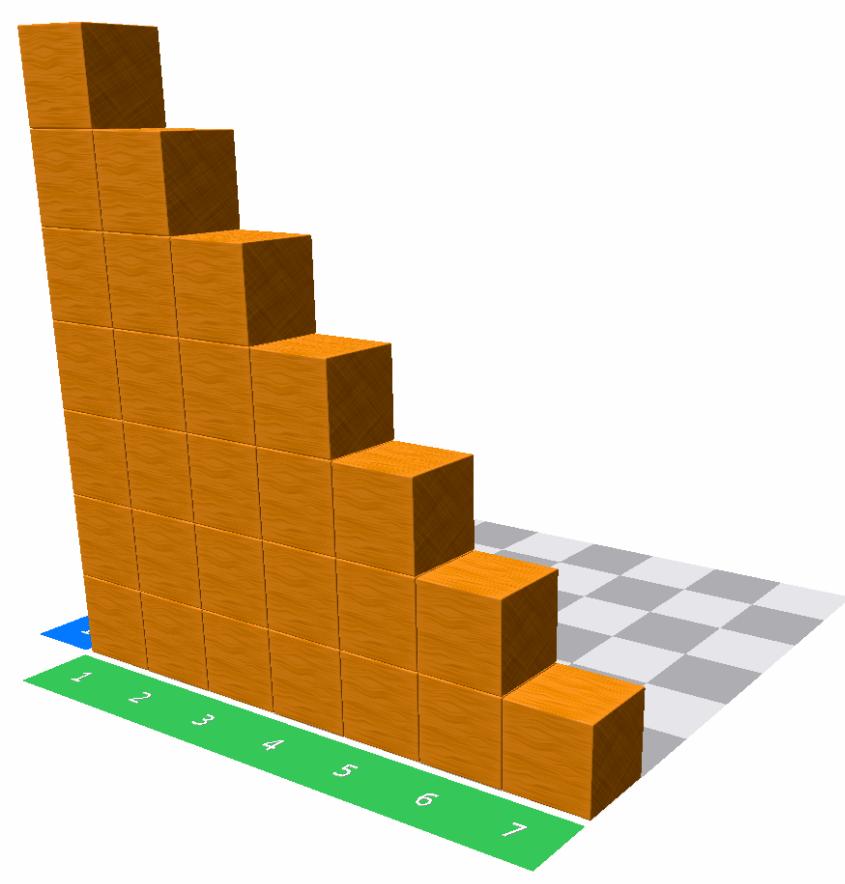
Complex exercises

Write a code to build the cube structures!


Structure 1

Structure 2

Structure 3
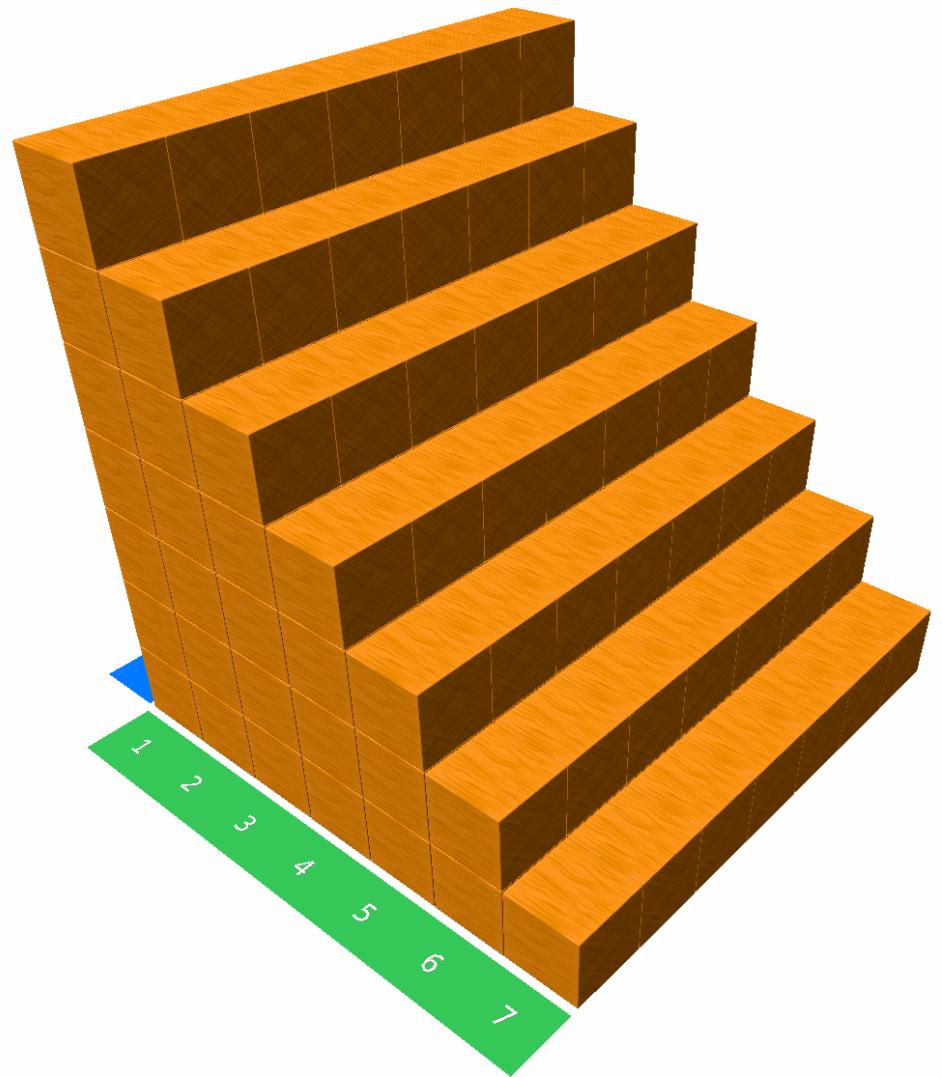
Structure 4

Complex exercises
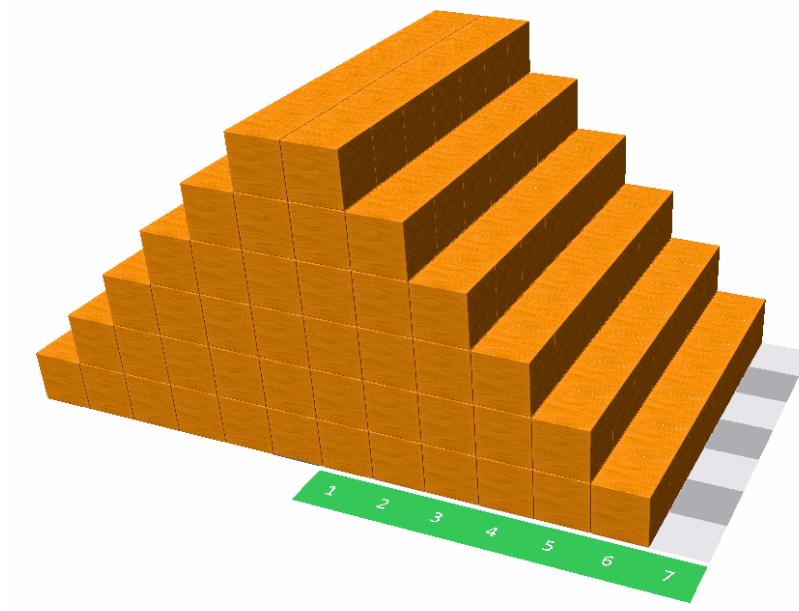
Write a code to build the cube structures!
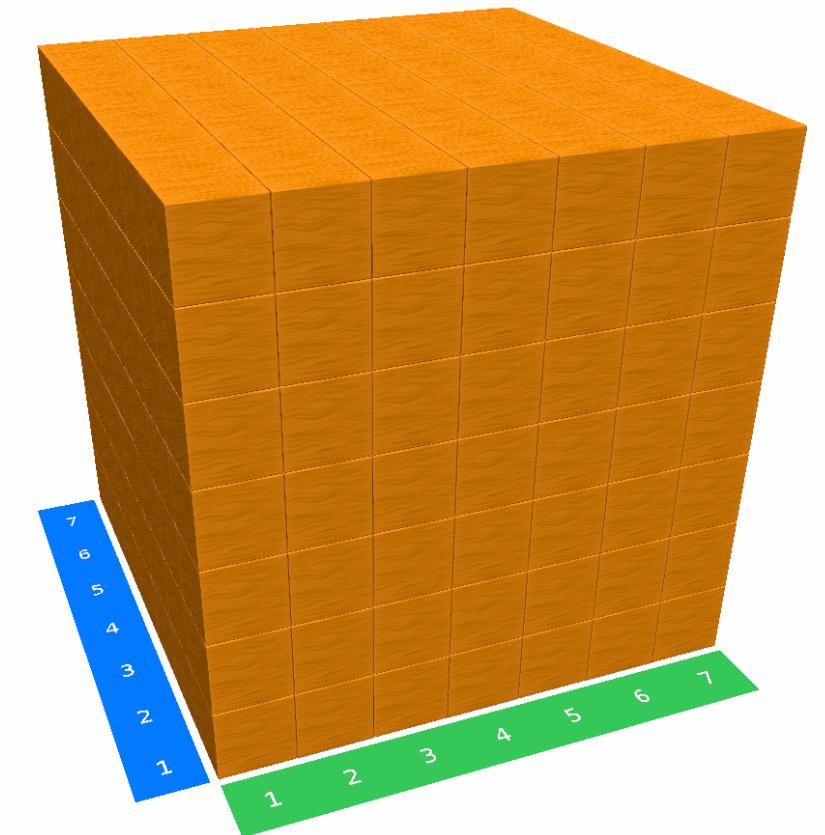
Structure 5   Structure 6   Structure 7   Structure 8