--- Day 17: Pyroclastic Flow ---

Your handheld device has located an alternative exit from the cave for you
and the elephants. The ground is rumbling almost continuously now, but the
strange valves bought you some time. It's definitely getting warmer in
here, though.

The tunnels eventually open into a very tall, narrow chamber. Large, oddly-
shaped rocks are falling into the chamber from above, presumably due to all
the rumbling. If you can't work out where the rocks will fall next, you
might be crushed!

The five types of rocks have the following peculiar shapes, where # is rock
and . is empty space:

```
####

.#.
###
.#.

..#
..#
###

#
#
#
#

##
##
```

The rocks fall in the order shown above: first the - shape, then the +
shape, and so on. Once the end of the list is reached, the same order
repeats: the - shape falls first, sixth, 11th, 16th, etc.

The rocks don't spin, but they do get pushed around by jets of hot gas
coming out of the walls themselves. A quick scan reveals the effect the
jets of hot gas will have on the rocks as they fall (your puzzle input).

For example, suppose this was the jet pattern in your cave:

```
>>><<><>><<<>><>>><<<>>><<<><<<>><>><<>>
```

In jet patterns, < means a push to the left, while > means a push to the
right. The pattern above means that the jets will push a falling rock
right, then right, then right, then left, then left, then right, and so on.
If the end of the list is reached, it repeats.

The tall, vertical chamber is exactly seven units wide. Each rock appears
so that its left edge is two units away from the left wall and its bottom
edge is three units above the highest rock in the room (or the floor, if
there isn't one).

After a rock appears, it alternates between being pushed by a jet of hot
gas one unit (in the direction indicated by the next symbol in the jet
pattern) and then falling one unit down. If any movement would cause any
part of the rock to move into the walls, floor, or a stopped rock, the
movement instead does not occur. If a downward movement would have caused a
falling rock to move into the floor or an already-fallen rock, the falling
rock stops where it is (having landed on something) and a new rock
immediately begins falling.

Drawing falling rocks with @ and stopped rocks with #, the jet pattern in
the example above manifests as follows:

```
The first rock begins falling:
|..@@@@.|
|.......|
|.......|
|.......|
+-------+

Jet of gas pushes rock right:
|...@@@@|
|.......|
|.......|
|.......|
+-------+

Rock falls 1 unit:
|...@@@@|
|.......|
|.......|
+-------+

Jet of gas pushes rock right, but nothing happens:
|...@@@@|
|.......|
|.......|
+-------+

Rock falls 1 unit:
|...@@@@|
|.......|
+-------+

Jet of gas pushes rock right, but nothing happens:
|...@@@@|
|.......|
+-------+

Rock falls 1 unit:
|...@@@@|
+-------+

Jet of gas pushes rock left:
|..@@@@.|
+-------+

Rock falls 1 unit, causing it to come to rest:
|..####.|
+-------+

A new rock begins falling:
|...@...|
|..@@@..|
|...@...|
|.......|
|.......|
|.......|
|..####.|
+-------+

Jet of gas pushes rock left:
|..@....|
|.@@@...|
|..@....|
|.......|
|.......|
|.......|
|..####.|
+-------+

Rock falls 1 unit:
|..@....|
```

```
|..@....|
|.@@@...|
|..@....|
|.......|
|.......|
|..####.|
+-------+

Jet of gas pushes rock right:
|...@...|
|..@@@..|
|...@...|
|.......|
|.......|
|..####.|
+-------+

Rock falls 1 unit:
|...@...|
|..@@@..|
|...@...|
|.......|
|..####.|
+-------+

Jet of gas pushes rock left:
|..@....|
|.@@@...|
|..@....|
|.......|
|..####.|
+-------+

Rock falls 1 unit:
|..@....|
|.@@@...|
|..@....|
|..####.|
+-------+

Jet of gas pushes rock right:
|...@...|
|..@@@..|
|...@...|
|..####.|
+-------+

Rock falls 1 unit, causing it to come to rest:
|...#...|
|..###..|
|...#...|
|..####.|
+-------+

A new rock begins falling:
|....@..|
|....@..|
|..@@@..|
|.......|
|.......|
|.......|
|...#...|
|..###..|
|...#...|
|..####.|
+-------+
```
The moment each of the next few rocks begins falling, you would see this:

```
|..@....|
|..@....|
|..@....|
|..@....|
|.......|
|.......|
|.......|
|..#....|
|..#....|
|####...|
|..###..|
|...#...|
|..####.|
+-------+

|..@@...|
|..@@...|
|.......|
|.......|
|.......|
|....#..|
|..#.#..|
|..#.#..|
|####..|
|..###..|
|...#...|
|..####.|
+-------+

|..@@@@.|
|.......|
|.......|
|.......|
|.......|
|....##.|
|....##.|
|....#..|
|..#.#..|
|..#.#..|
|#####..|
|..###..|
|...#...|
|..####.|
+-------+

|...@...|
|..@@@..|
|...@...|
|.......|
|.......|
|.......|
|.####..|
|....##.|
|....##.|
|....#..|
|..#.#..|
|..#.#..|
|#####..|
|..###..|
|...#...|
|..####.|
+-------+

|....@..|
|....@..|
|..@@@..|
|.......|
|.......|
|.......|
|..#....|
|.###...|
```

```
|."""...|
|..#....|
|.####..|
|....##.|
|....##.|
|....#..|
|..#.#..|
|..#.#..|
|#####..|
|..###..|
|...#...|
|..####.|
+-------+

|..@....|
|..@....|
|..@....|
|..@....|
|.......|
|.......|
|.......|
|.....#.|
|.....#.|
|..####.|
|.###...|
|..#....|
|.####..|
|....##.|
|....##.|
|....#..|
|..#.#..|
|..#.#..|
|#####..|
|..###..|
|...#...|
|..####.|
+-------+

|..@@...|
|..@@...|
|.......|
|.......|
|.......|
|....#..|
|....#..|
|....##.|
|....##.|
|..####.|
|.###...|
|..#....|
|.####..|
|....##.|
|....##.|
|....#..|
|..#.#..|
|..#.#..|
|#####..|
|..###..|
|...#...|
|..####.|
+-------+

|..@@@@.|
|.......|
|.......|
|.......|
|....#..|
|....#..|
|....##.|
|##..##.|
```

```
|######.|
|.###...|
|..#....|
|.####..|
|....##.|
|....##.|
|....#..|
|..#.#..|
|..#.#..|
|####..|
|..###..|
|...#...|
|..####.|
+-------+
```
To prove to the elephants your simulation is accurate, they want to know how tall the tower will get after 2022 rocks have stopped (but before the 2023rd rock begins falling). In this example, the tower of rocks will be `3068` units tall.

How many units tall will the tower of rocks be after 2022 rocks have stopped falling?

Your puzzle answer was `3153`.

--- Part Two ---

The elephants are not impressed by your simulation. They demand to know how tall the tower will be after `1000000000000` rocks have stopped! Only then will they feel confident enough to proceed through the cave.

In the example above, the tower would be `1514285714288` units tall!

How tall will the tower be after `1000000000000` rocks have stopped?

Your puzzle answer was `1553665689155`.

Both parts of this puzzle are complete! They provide two gold stars: **

At this point, you should return to your Advent calendar and try another puzzle.

If you still want to see it, you can get your puzzle input.

You can also [Share] this puzzle.