

### --- Day 8: Treetop Tree House ---

The expedition comes across a peculiar patch of tall trees all planted carefully in a grid. The Elves explain that a previous expedition planted these trees as a reforestation effort. Now, they're curious if this would be a good location for a **tree house**.

First, determine whether there is enough tree cover here to keep a tree house **hidden**. To do this, you need to count the number of trees that are **visible from outside the grid** when looking directly along a row or column.

The Elves have already launched a **quadcopter** to generate a map with the height of each tree (your puzzle input). For example:

```
30373
25512
65332
33549
35390
```

Each tree is represented as a single digit whose value is its height, where **0** is the shortest and **9** is the tallest.

A tree is **visible** if all of the other trees between it and an edge of the grid are **shorter** than it. Only consider trees in the same row or column; that is, only look up, down, left, or right from any given tree.

All of the trees around the edge of the grid are **visible** - since they are already on the edge, there are no trees to block the view. In this example, that only leaves the **interior nine trees** to consider:

- The top-left **5** is **visible** from the left and top. (It isn't visible from the right or bottom since other trees of height **5** are in the way.)
- The top-middle **5** is **visible** from the top and right.
- The top-right **1** is not visible from any direction; for it to be visible, there would need to only be trees of height **0** between it and an edge.
- The left-middle **5** is **visible**, but only from the right.
- The center **3** is not visible from any direction; for it to be visible, there would need to be only trees of at most height **2** between it and an edge.
- The right-middle **3** is **visible** from the right.
- In the bottom row, the middle **5** is **visible**, but the **3** and **4** are not.

With 16 trees visible on the edge and another 5 visible in the interior, a total of **21** trees are visible in this arrangement.

Consider your map; **how many trees are visible from outside the grid?**

Your puzzle answer was **1796**.

### --- Part Two ---

Content with the amount of tree cover available, the Elves just need to know the best spot to build their tree house: they would like to be able to see a lot of **trees**.

To measure the viewing distance from a given tree, look up, down, left, and right from that tree; stop if you reach an edge or at the first tree that is the same height or taller than the tree under consideration. (If a tree is right on the edge, at least one of its viewing distances will be zero.)

The Elves don't care about distant trees taller than those found by the

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rules above; the proposed tree house has large **eaves** to keep it dry, so they wouldn't be able to see higher than the tree house anyway.

In the example above, consider the middle **5** in the second row:

```
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25512
65332
33549
35390
```

- Looking up, its view is not blocked; it can see **1** tree (of height **3**).
- Looking left, its view is blocked immediately; it can see only **1** tree (of height **5**, right next to it).
- Looking right, its view is not blocked; it can see **2** trees.
- Looking down, its view is blocked eventually; it can see **2** trees (one of height **3**, then the tree of height **5** that blocks its view).

A tree's **scenic score** is found by multiplying together its viewing distance in each of the four directions. For this tree, this is **4** (found by multiplying  $1 * 1 * 2 * 2$ ).

However, you can do even better: consider the tree of height **5** in the middle of the fourth row:

```
30373
25512
65332
33549
35390
```

- Looking up, its view is blocked at **2** trees (by another tree with a height of **5**).
- Looking left, its view is not blocked; it can see **2** trees.
- Looking down, its view is also not blocked; it can see **1** tree.
- Looking right, its view is blocked at **2** trees (by a massive tree of height **9**).

This tree's scenic score is **8** ( $2 * 2 * 1 * 2$ ); this is the ideal spot for the tree house.

Consider each tree on your map. What is the highest scenic score possible for any tree?

Your puzzle answer was **288120**.

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.