

--- Day 16: Reindeer Maze ---

It's time again for the **Reindeer Olympics**! This year, the big event is the **Reindeer Maze**, where the Reindeer compete for the **lowest score**.

You and The Historians arrive to search for the Chief right as the event is about to start. It wouldn't hurt to watch a little, right?

The Reindeer start on the Start Tile (marked **S**) facing **East** and need to reach the End Tile (marked **E**). They can move forward one tile at a time (increasing their score by **1** point), but never into a wall (**#**). They can also rotate clockwise or counterclockwise 90 degrees at a time (increasing their score by **1000** points).

To figure out the best place to sit, you start by grabbing a map (your puzzle input) from a nearby kiosk. For example:

```
#####
#.....#...E#
#.#.##.#.##.#
#....#...#.#
#..##.#####.#
#.#.#.....#.#
#.#.####.#.#.#
#.....#.#.#
###.#.####.#.#
#...#....#.#.#
#.#.#.##.#.#.#
#....#...#.#.#
#..##.#.#.#.#
#S...#.....#
#####
```

There are many paths through this maze, but taking any of the best paths would incur a score of only **7036**. This can be achieved by taking a total of **36** steps forward and turning 90 degrees a total of **7** times:

```
#####
#.....#...E#
#.#.##.#.##^#
#....#...#^#
#..##.#####^#
#.#.#.....#^#
#.#.####.###^#
#..>>>>>>v^#
###^#.#.###v^#^#
#>>^#.....#v^#^#
#^#.#.##.#v^#^#
#^....#...#v^#^#
#^###.#.#.#v^#^#
#S...#.....#>>^#
#####
```

Here's a second example:

```
#####
#.....#...E#
#.#.#.#.#.#.#
#.#.#.#.#.#.#
#.#.#.###.#.#
#...#.#.#.#.#
#.#.#.#.#.####.#
#...#.#.#.#....#
#.#.####.#.##.#
#.#.#.....#...#
#.#.####.###.###
#.#.#....#....#
#.#.#.####.###.#
#.#.#.....#.#
#.#.#####.#
#S#.....#
#####
```

In this maze, the best paths cost **11048** points; following one such path would look like this:

```
#####
#...#...#...E#
#.#.#.#.#.#^#
#.#.#.#.#.#^#
#.#.#.###.#^#
#>>v#.#.#....#^#
#^#v#.#.#.####^#
#^#v..#.#.>>>>^#
#^#v####.#^###.#
#^#v#...>>>>^#...#
#^#v####^####.###
#^#v>>>^#....#.#
#^#v#^####.###.#
#^#v#^.....#.#
#^#v#^#####.#
#S#>>^#.....#
#####
```

Note that the path shown above includes one 90 degree turn as the very first move, rotating the Reindeer from facing East to facing North.

Analyze your map carefully. **What is the lowest score a Reindeer could possibly get?**

Your puzzle answer was **90460**.

--- Part Two ---

Now that you know what the best paths look like, you can figure out the best spot to sit.

Every non-wall tile (**S**, **^**, or **E**) is equipped with places to sit along the edges of the tile. While determining which of these tiles would be the best spot to sit depends on a whole bunch of factors (how comfortable the seats are, how far away the bathrooms are, whether there's a pillar blocking your view, etc.), the most important factor is **whether the tile is on one of the best paths through the maze**. If you sit somewhere else, you'd miss all the action!

So, you'll need to determine which tiles are part of **any** best path through the maze, including the **S** and **E** tiles.

In the first example, there are **45** tiles (marked **0**) that are part of at least one of the various best paths through the maze:

```
#####
#.....#...0#
#.#.##.#.##0#
#....#...#0#
#..##.#####0#
#.#.#.....#0#
#.#.####.###0#
#..000000000#0#
##0#0####0#0#
#000#0...#0#0#
#0#0#0##.#0#0#
#0000#...#0#0#
#0###.#.#.#0#0#
#0..#.....#000#
#####
```

In the second example, there are **64** tiles that are part of at least one of the best paths:

```
#####
#...#...#...0#
#.#.#.#.#.#.#0#
#.#.#.#.#.#.#0#
#.#.#.###.#.#0#
#000#.#.#....#0#
#0#0#.#.#.###0#
#0#0..#.#.#00000#
#0#0####.#0##0#
#0#0#..00000#000#
#0#0###0####0##
#0#0#000#..000#.#
#0#0#0####0##.#
#0#0#0000000..#.#
#0#0#0#####.#
#0#000.....#
#####
```

Analyze your map further. **How many tiles are part of at least one of the best paths through the maze?**

Your puzzle answer was **575**.

**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.

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