--- 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 `105496`.

--- 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 `O`) that are part of at least one of the various best paths through the maze:

```
###############
#.......#....O#
#.#.###.#.###O#
#.....#.#...#O#
#.###.#####.#O#
#.#.#.......#O#
#.#.#####.###O#
#..OOOOOOOOO#O#
###O#O#####O#O#
#OOO#O....#O#O#
#O#O#O###.#O#O#
#OOOO#...#O#O#
#O###.#.#.#O#O#
#O..#.....#OO#
###############
```

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

```
#################
#...#...#...#..O#
#.#.#.#.#.#.#.#O#
#.#.#.#...#...#O#
#.#.#.#.###.#.#O#
#OOO#.#.#.....#O#
#O#O#.#.#.#####O#
#O#O..#.#.#OOOOO#
#O#O#####.#O###O#
#O#O#..OOOOO#OOO#
#O#O###O####O###O#
#O#O#OOO#..OOO#.#
#O#O#O####O###.#
#O#O#OOOOOOO..#.#
#O#O#O#########.#
#O#OOO.........#
#################
```

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

Your puzzle answer was `524`.

**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.