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--- Day 12: Garden Groups ---

Why not search for the Chief Historian near the gardener and his
massive farm? There's plenty of food, so The Historians grab something to
eat while they search.

You're about to settle near a complex arrangement of garden plots when some
Elves ask if you can lend a hand. They'd like to set up fences around each
region of garden plots, but they can't figure out how much fence they need
to order or how much it will cost. They hand you a map (your puzzle input)
of the garden plots.

Each garden plot grows only a single type of plant and is indicated by a
single letter on your map. When multiple garden plots are growing the same
type of plant and are touching (horizontally or vertically), they form a
region. For example:

```
AAAA
BBCD
BBCC
EEEC
```

This 4x4 arrangement includes garden plots growing five different types of
plants (labeled A, B, C, D, and E), each grouped into their own region.

In order to accurately calculate the cost of the fence around a single
region, you need to know that region's area and perimeter.

The area of a region is simply the number of garden plots the region
contains. The above map's type A, B, and C plants are each in a region of
area 4. The type E plants are in a region of area 3; the type D plants are
in a region of area 1.

Each garden plot is a square and so has four sides. The perimeter of a
region is the number of sides of garden plots in the region that do not
touch another garden plot in the same region. The type A and C plants are
each in a region with perimeter 10. The type B and E plants are each in a
region with perimeter 8. The lone D plot forms its own region with
perimeter 4.

Visually indicating the sides of plots in each region that contribute to
the perimeter using - and |, the above map's regions' perimeters are
measured as follows:

```
+-+-+-+-+
|A A A A|
+-+-+-+-+     +-+
              |D|
+-+-+   +-+   +-+
|B B|   |C|
+   +   + +-+
|B B|   |C C|
+-+-+   +-+ +
          |C|
+-+-+-+   +-+
|E E E|
+-+-+-+
```

Plants of the same type can appear in multiple separate regions, and
regions can even appear within other regions. For example:

```
OOOOO
OXOXO
OOOOO
OXOXO
OOOOO
```

The above map contains `five` regions, one containing all of the `O` garden
plots, and the other four each containing a single `X` plot.

The four `X` regions each have area `1` and perimeter `4`. The region containing
`21` type `O` plants is more complicated; in addition to its outer edge
contributing a perimeter of `20`, its boundary with each `X` region contributes
an additional `4` to its perimeter, for a total perimeter of `36`.

Due to "modern" business practices, the `price` of fence required for a
region is found by `multiplying` that region's area by its perimeter. The
`total price` of fencing all regions on a map is found by adding together the
price of fence for every region on the map.

In the first example, region `A` has price `4 * 10 = 40`, region `B` has price
`4 * 8 = 32`, region `C` has price `4 * 10 = 40`, region `D` has price `1 * 4 = 4`,
and region `E` has price `3 * 8 = 24`. So, the total price for the first
example is `140`.

In the second example, the region with all of the `O` plants has price
`21 * 36 = 756`, and each of the four smaller `X` regions has price `1 * 4 = 4`,
for a total price of `772` (756 + 4 + 4 + 4 + 4).

Here's a larger example:

```
RRRRIICCFF
RRRRIICCCF
VVRRRCCFFF
VVRCCCJFFF
VVVVCJJCFE
VVIVCCJJEE
VVIIICJJEE
MIIIIIJJEE
MIIISIJEEE
MMMISSJEEE
```

It contains:

  - A region of `R` plants with price `12 * 18 = 216`.
  - A region of `I` plants with price `4 * 8 = 32`.
  - A region of `C` plants with price `14 * 28 = 392`.
  - A region of `F` plants with price `10 * 18 = 180`.
  - A region of `V` plants with price `13 * 20 = 260`.
  - A region of `J` plants with price `11 * 20 = 220`.
  - A region of `C` plants with price `1 * 4 = 4`.
  - A region of `E` plants with price `13 * 18 = 234`.
  - A region of `I` plants with price `14 * 22 = 308`.
  - A region of `M` plants with price `5 * 12 = 60`.
  - A region of `S` plants with price `3 * 8 = 24`.

So, it has a total price of `1930`.

What is the total price of fencing all regions on your map?

To begin, get your puzzle input.

Answer: [_____] [Submit]

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