Advent of Code   [About]   [Events]   [Shop]   [Settings]   [Log Out]   Roland Tritsch (AoC++) 24*
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--- Day 18: Operation Order ---

As you look out the window and notice a heavily-forested continent slowly
appear over the horizon, you are interrupted by the child sitting next to
you. They're curious if you could help them with their math homework.

Unfortunately, it seems like this "math" follows different rules than you
remember.

The homework (your puzzle input) consists of a series of expressions that
consist of addition (+), multiplication (*), and parentheses ((...)). Just
like normal math, parentheses indicate that the expression inside must be
evaluated before it can be used by the surrounding expression. Addition
still finds the sum of the numbers on both sides of the operator, and
multiplication still finds the product.

However, the rules of operator precedence have changed. Rather than
evaluating multiplication before addition, the operators have the same
precedence, and are evaluated left-to-right regardless of the order in
which they appear.

For example, the steps to evaluate the expression 1 + 2 * 3 + 4 * 5 + 6 are
as follows:

```
1 + 2 * 3 + 4 * 5 + 6
  3   * 3 + 4 * 5 + 6
      9   + 4 * 5 + 6
         13   * 5 + 6
             65   + 6
                 71
```

Parentheses can override this order; for example, here is what happens if
parentheses are added to form 1 + (2 * 3) + (4 * (5 + 6)):

```
1 + (2 * 3) + (4 * (5 + 6))
1 +    6    + (4 * (5 + 6))
    7       + (4 * (5 + 6))
    7       + (4 *   11   )
    7       +     44
            51
```

Here are a few more examples:

  - 2 * 3 + (4 * 5) becomes 26.
  - 5 + (8 * 3 + 9 + 3 * 4 * 3) becomes 437.
  - 5 * 9 * (7 * 3 * 3 + 9 * 3 + (8 + 6 * 4)) becomes 12240.
  - ((2 + 4 * 9) * (6 + 9 * 8 + 6) + 6) + 2 + 4 * 2 becomes 13632.

Before you can help with the homework, you need to understand it yourself.
Evaluate the expression on each line of the homework; what is the sum of
the resulting values?

Your puzzle answer was 209335026987.

The first half of this puzzle is complete! It provides one gold star: *
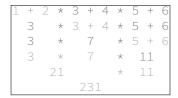
--- Part Two ---

You manage to answer the child's questions and they finish part 1 of their
homework, but get stuck when they reach the next section: advanced math.

Now, addition and multiplication have different precedence levels, but
they're not the ones you're familiar with. Instead, addition is evaluated
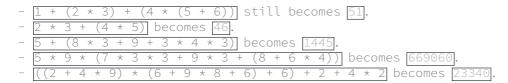before multiplication.

For example, the steps to evaluate the expression `1 + 2 * 3 + 4 * 5 + 6` are now as follows:

```
1 + 2 * 3 + 4 * 5 + 6
  3   * 3 + 4 * 5 + 6
  3   *   7   * 5 + 6
  3   *   7   *  11
     21          *  11
           231
```

Here are the other examples from above:

- `1 + (2 * 3) + (4 * (5 + 6))` still becomes `51`.
- `2 * 3 + (4 * 5)` becomes `46`.
- `5 + (8 * 3 + 9 + 3 * 4 * 3)` becomes `1445`.
- `5 * 9 * (7 * 3 * 3 + 9 * 3 + (8 + 6 * 4))` becomes `669060`.
- `((2 + 4 * 9) * (6 + 9 * 8 + 6) + 6) + 2 + 4 * 2` becomes `23340`.

What do you get if you add up the results of evaluating the homework problems using these new rules?

Answer: [＿＿＿＿＿＿＿＿＿＿] [Submit]

Although it hasn't changed, you can still get your puzzle input.

You can also [Share] this puzzle.