

--- Day 9: Stream Processing ---

A large stream blocks your path. According to the locals, it's not safe to cross the stream at the moment because it's full of **garbage**. You look down at the stream; rather than water, you discover that it's a **stream of characters**.

You sit for a while and record part of the stream (your puzzle input). The characters represent **groups** - sequences that begin with `{` and end with `}`. Within a group, there are zero or more other things, separated by commas: either another **group** or **garbage**. Since groups can contain other groups, a `}` only closes the **most-recently-opened unclosed group** - that is, they are nestable. Your puzzle input represents a single, large group which itself contains many smaller ones.

Sometimes, instead of a group, you will find **garbage**. Garbage begins with `<` and ends with `>`. Between those angle brackets, almost any character can appear, including `{` and `}`. **Within** garbage, `<` has no special meaning.

In a futile attempt to clean up the garbage, some program has **canceled** some of the characters within it using `!`: inside garbage, **any** character that comes after `!` should be **ignored**, including `<`, `>`, and even another `!`.

You don't see any characters that deviate from these rules. Outside garbage, you only find well-formed groups, and garbage always terminates according to the rules above.

Here are some self-contained pieces of garbage:

- `<>`, empty garbage.
- `<random characters>`, garbage containing random characters.
- `<<<<>`, because the extra `<` are ignored.
- `<{!}>`, because the first `>` is canceled.
- `<!!>`, because the second `!` is canceled, allowing the `>` to terminate the garbage.
- `<!!!!>`, because the second `!` and the first `>` are canceled.
- `<{"i!a,<{i<a}>`, which ends at the first `>`.

Here are some examples of whole streams and the number of groups they contain:

- `{}`, **1** group.
- `{{{}}}`, **3** groups.
- `{{},{}}`, also **3** groups.
- `{{{},{},{{{}}}}`, **6** groups.
- `{<{},{},{{{}}>}`, **1** group (which itself contains garbage).
- `{<a>,<a>,<a>,<a>}`, **1** group.
- `{{<a>},{<a>},{<a>},{<a>}}`, **5** groups.
- `{{<!!>},{<!!>},{<!!>},{<a>}}`, **2** groups (since all but the last `>` are canceled).

Your goal is to find the total score for all groups in your input. Each group is assigned a **score** which is one more than the score of the group that immediately contains it. (The outermost group gets a score of **1**.)

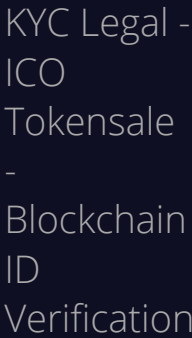
- `{}`, score of **1**.
- `{{{}}}`, score of **1 + 2 + 3 = 6**.
- `{{},{}}`, score of **1 + 2 + 2 = 5**.
- `{{{},{},{{{}}}}`, score of **1 + 2 + 3 + 3 + 3 + 4 = 16**.
- `{<a>,<a>,<a>,<a>}`, score of **1**.
- `{{<ab>},{<ab>},{<ab>},{<ab>}}`, score of **1 + 2 + 2 + 2 + 2 = 9**.
- `{{<!!>},{<!!>},{<!!>},{<!!>}}`, score of **1 + 2 + 2 + 2 + 2 = 9**.
- `{{<a!>},{<a!>},{<a!>},{<ab>}}`, score of **1 + 2 = 3**.

What is the total score for all groups in your input?

Your puzzle answer was **12897**.

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--- Part Two ---

Now, you're ready to remove the garbage.

To prove you've removed it, you need to count all of the characters within the garbage. The leading and trailing `<` and `>` don't count, nor do any canceled characters or the `!` doing the canceling.

- `<>`, 0 characters.
- `<random characters>`, 17 characters.
- `<<<<>`, 3 characters.
- `<{!>>`, 2 characters.
- `<!!>`, 0 characters.
- `<!!!!>`, 0 characters.
- `<{o"i!a,<{i<a>`, 10 characters.

How many non-canceled characters are within the garbage in your puzzle input?

Your puzzle answer was `7031`.

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.