--- Day 7: Handy Haversacks ---

You land at the regional airport in time for your next flight. In fact, it looks like you'll even have time to grab some food: all flights are currently delayed due to **issues in luggage processing**.

Due to recent aviation regulations, many rules (your puzzle input) are being enforced about bags and their contents; bags must be color-coded and must contain specific quantities of other color-coded bags. Apparently, nobody responsible for these regulations considered how long they would take to enforce!

For example, consider the following rules:

```
light red bags contain 1 bright white bag, 2 muted yellow bags.
dark orange bags contain 3 bright white bags, 4 muted yellow bags.
bright white bags contain 1 shiny gold bag.
muted yellow bags contain 2 shiny gold bags, 9 faded blue bags.
shiny gold bags contain 1 dark olive bag, 2 vibrant plum bags.
dark olive bags contain 3 faded blue bags, 4 dotted black bags.
vibrant plum bags contain 5 faded blue bags, 6 dotted black bags.
faded blue bags contain no other bags.
dotted black bags contain no other bags.
```

These rules specify the required contents for 9 bag types. In this example, every `faded blue` bag is empty, every `vibrant plum` bag contains 11 bags (5 `faded blue` and 6 `dotted black`), and so on.

You have a `shiny gold` bag. If you wanted to carry it in at least one other bag, how many different bag colors would be valid for the outermost bag? (In other words: how many colors can, eventually, contain at least one `shiny gold` bag?)

In the above rules, the following options would be available to you:

- A `bright white` bag, which can hold your `shiny gold` bag directly.
- A `muted yellow` bag, which can hold your `shiny gold` bag directly, plus some other bags.
- A `dark orange` bag, which can hold `bright white` and `muted yellow` bags, either of which could then hold your `shiny gold` bag.
- A `light red` bag, which can hold `bright white` and `muted yellow` bags, either of which could then hold your `shiny gold` bag.

So, in this example, the number of bag colors that can eventually contain at least one `shiny gold` bag is `4`.

**How many bag colors can eventually contain at least one `shiny gold` bag?** (The list of rules is quite long; make sure you get all of it.)

Your puzzle answer was `378`.

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

--- Part Two ---

It's getting pretty expensive to fly these days - not because of ticket prices, but because of the ridiculous number of bags you need to buy!

Consider again your `shiny gold` bag and the rules from the above example:

- `faded blue` bags contain `0` other bags.
- `dotted black` bags contain `0` other bags.
- `vibrant plum` bags contain `11` other bags: 5 `faded blue` bags and 6 `dotted black` bags.
- `dark olive` bags contain `7` other bags: 3 `faded blue` bags and 4 `dotted black` bags.

So, a single `shiny gold` bag must contain 1 `dark olive` bag (and the 7 bags within it) plus 2 `vibrant plum` bags (and the 11 bags within **each** of those): `1 + 1*7 + 2 + 2*11` = `32` bags!

Of course, the actual rules have a small chance of going several levels deeper than this example; be sure to count all of the bags, even if the nesting becomes topologically impractical!

Here's another example:

```
shiny gold bags contain 2 dark red bags.
dark red bags contain 2 dark orange bags.
dark orange bags contain 2 dark yellow bags.
dark yellow bags contain 2 dark green bags.
dark green bags contain 2 dark blue bags.
dark blue bags contain 2 dark violet bags.
dark violet bags contain no other bags.
```

In this example, a single `shiny gold` bag must contain `126` other bags.

**How many individual bags are required inside your single `shiny gold` bag?**

Answer: [Submit]

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

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