

--- Day 2: Cube Conundrum ---

You're launched high into the atmosphere! The apex of your trajectory just barely reaches the surface of a large island floating in the sky. You gently land in a fluffy pile of leaves. It's quite cold, but you don't see much snow. An Elf runs over to greet you.

The Elf explains that you've arrived at **Snow Island** and apologizes for the lack of snow. He'll be happy to explain the situation, but it's a bit of a walk, so you have some time. They don't get many visitors up here; would you like to play a game in the meantime?

As you walk, the Elf shows you a small bag and some cubes which are either red, green, or blue. Each time you play this game, he will hide a secret number of cubes of each color in the bag, and your goal is to figure out information about the number of cubes.

To get information, once a bag has been loaded with cubes, the Elf will reach into the bag, grab a handful of random cubes, show them to you, and then put them back in the bag. He'll do this a few times per game.

You play several games and record the information from each game (your puzzle input). Each game is listed with its ID number (like the **11** in **Game 11: ...**) followed by a semicolon-separated list of subsets of cubes that were revealed from the bag (like **3 red, 5 green, 4 blue**).

For example, the record of a few games might look like this:

```
Game 1: 3 blue, 4 red; 1 red, 2 green, 6 blue; 2 green
Game 2: 1 blue, 2 green; 3 green, 4 blue, 1 red; 1 green, 1 blue
Game 3: 8 green, 6 blue, 20 red; 5 blue, 4 red, 13 green; 5 green, 1 red
Game 4: 1 green, 3 red, 6 blue; 3 green, 6 red; 3 green, 15 blue, 14 red
Game 5: 6 red, 1 blue, 3 green; 2 blue, 1 red, 2 green
```

In game 1, three sets of cubes are revealed from the bag (and then put back again). The first set is 3 blue cubes and 4 red cubes; the second set is 1 red cube, 2 green cubes, and 6 blue cubes; the third set is only 2 green cubes.

The Elf would first like to know which games would have been possible if the bag contained only **12 red cubes, 13 green cubes, and 14 blue cubes**?

In the example above, games 1, 2, and 5 would have been **possible** if the bag had been loaded with that configuration. However, game 3 would have been **impossible** because at one point the Elf showed you 20 red cubes at once; similarly, game 4 would also have been **impossible** because the Elf showed you 15 blue cubes at once. If you add up the IDs of the games that would have been possible, you get **8**.

Determine which games would have been possible if the bag had been loaded with only 12 red cubes, 13 green cubes, and 14 blue cubes. **What is the sum of the IDs of those games?**

Your puzzle answer was **2685**.

--- Part Two ---

The Elf says they've stopped producing snow because they aren't getting any **water**! He isn't sure why the water stopped; however, he can show you how to get to the water source to check it out for yourself. It's just up ahead!

As you continue your walk, the Elf poses a second question: in each game you played, what is the **fewest number of cubes of each color** that could have been in the bag to make the game possible?

Again consider the example games from earlier:

```
Game 1: 3 blue, 4 red; 1 red, 2 green, 6 blue; 2 green
Game 2: 1 blue, 2 green; 3 green, 4 blue, 1 red; 1 green, 1 blue
Game 3: 8 green, 6 blue, 20 red; 5 blue, 4 red, 13 green; 5 green, 1 red
Game 4: 1 green, 3 red, 6 blue; 3 green, 6 red; 3 green, 15 blue, 14 red
Game 5: 6 red, 1 blue, 3 green; 2 blue, 1 red, 2 green
```

- In game 1, the game could have been played with as few as 4 red, 2 green, and 6 blue cubes. If any color had even one fewer cube, the game would have been impossible.
- Game 2 could have been played with a minimum of 1 red, 3 green, and 4 blue cubes.
- Game 3 must have been played with at least 20 red, 13 green, and 6 blue cubes.
- Game 4 required at least 14 red, 3 green, and 15 blue cubes.
- Game 5 needed no fewer than 6 red, 3 green, and 2 blue cubes in the bag.

The **power** of a set of cubes is equal to the numbers of red, green, and blue cubes multiplied together. The power of the minimum set of cubes in game 1 is **48**. In games 2-5 it was **12**, **1560**, **630**, and **36**, respectively. Adding up these five powers produces the sum **2286**.

For each game, find the minimum set of cubes that must have been present. **What is the sum of the power of these sets?**

Your puzzle answer was **83707**.

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**.

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