

Problem RANDBATTLE: Random Battle Droid

Battle Droids look all same to you? That made the IFF (Identification, friend or foe) devices of the opposing party, the Galactic Republic, very easy to build. The lead Battle Droid constructor got aware of this and decided to randomly change the look of the Battle Droids. He invented 5 different kinds of torsos, 3 different kinds of arms, and so on. As any robots, the battle droids are produced in one single long conveyor with different production stages. In each stage one decision out of a number of choices can be made. To make this decision random the factory uses dice as they do not trust random number generators. So in the end the look of the battle can vary very much.



Figure 1: The Battle Droid army



Figure 2: Different flavors of Battle Droids (Images by jasonedmiston on deviantart.com)

The republic got totally caught pants down in the first fight against the first random Battle Droid army. So jedi master Yoda decided to manipulate the production line of the battle droids to reduce the number of possible different combinations of battle droids. He sends a number of jedi into the production. The jedi can manipulate the dice of consecutive production stages to roll always the same number.

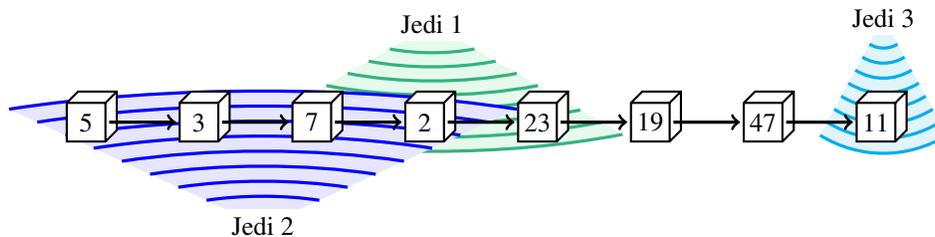


Figure 3: Yoda's third plan in Sample Input 1

Yoda has different plans how the jedi can position themselves to be able to control different consecutive stages. But calculate the resulting number of different combinations of Battle Droids you must.

Input

The first line contains two integers C and S , where C denotes the number of production steps, and S the number of plans ($1 \leq C \leq 10^6$; $1 \leq S \leq 10^5$). The next line contains C integers c_i , where c_i denotes the number of options for the i th production step ($1 \leq c_i \leq 10^8$).

Then follow S plan descriptions, each in two lines. The first line of the plan description contains an integer W , the number of jedi involved in that plan ($1 \leq W \leq 5$). The second line contains W ranges of fixed choices, each specified with two integers f_j and t_j , where f_j denotes the start of the range and t_j the end of the range (both inclusive, $0 \leq f_j \leq t_j < C$). Note that these ranges may overlap.

Output

Print one line for each plan containing the number of different Battle Droids modulo 1 645 333 507.

Sample Input 1

```
8 3
5 3 7 2 23 19 47 11
1
3 5
2
0 0 4 7
3
2 4 0 3 7 7
```

Sample Output 1

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54285
42
893
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