

8 Hello World 3 Pro Max

时间限制: 3000ms 空间限制: 256MB

8.1 题目描述

Once upon a time, Markyyz invented a problem named "Hello World".

Later, Markyyz invented a problem named "Hello World 2", which is a harder version of "Hello World".

Two thousand years later, SPY invented a problem named "Hello World 3", which is an even harder version of "Hello World".

Now, SPY is inventing a problem named "Hello World 3 Pro Max", which is ...

SPY has a string S of length n consisting of lowercase letters: h, e, l, o, w, r, d . The string is generated randomly in the following way: for each character in S , it is **independently** generated from the set $\{h, e, l, o, w, r, d\}$ with possibilities $p_1, p_2, \dots, p_7$. In other words, there is a probability of p_1 for the letter h , p_2 for the letter e , and so on. It is guaranteed that sum of p_i 's is equal to 1.

Initially, each character of string S is unknown. Then, SPY will perform q operations of two types:

- Type 1: $1\ x\ c$, which means SPY determines that the character S_x is c . In this problem, the characters in string S are indexed starting from 1, so S can be expressed as $S_1S_2S_3\dots S_n$. It is guaranteed that no two operations will conflict with each other.

- Type 2: $2\ l\ r$, which means SPY wants to know the expected number of **subsequences** equals to *helloworld* in the substring $S(l, r)$, modulo $10^9 + 7$. Here, $S(l, r)$ means the substring of S starting at index l and ending at index r (formally $S_lS_{l+1}\dots S_r$).

After each operation of Type 2, you should answer the query by outputting the expected number on a separate line, modulo $10^9 + 7$.

8.2 输入格式

There are multiple tests.

The first line of input consists a single integer t ($1 \leq t \leq 10$), representing the number of test cases.

In each test case, the following lines provide the details:

The first line consists a single integer n ($1 \leq n \leq 5 \times 10^4$), representing the length of string S .

The second line contains 7 integers $P_1, P_2, \dots, P_7$ ($1 \leq P_i \leq 10^8$). Let $P_t = P_1 + P_2 + \dots + P_7$ be the sum of these values. The possibilities of the letters are defined as $p_i = \frac{P_i}{P_t}$.

The third line contains a single integer q ($1 \leq q \leq 5 \times 10^4$), representing the number of operations.

The next q lines describe the operations, each line specifying the type and parameters of the operation.

It is guaranteed that sum of n in all test cases will not exceed 5×10^4 , sum of q in all test cases will not exceed 5×10^4 .

8.3 输出格式

After every operation of Type 2, output the expected number on a single line, modulo $10^9 + 7$.

8.4 输入输出样例

输入样例:

```
1
11
1 1 1 1 1 1 1
```

16
1 1 h
2 1 11
2 2 11
1 2 e
1 3 l
1 4 l
1 5 l
2 1 11
1 6 o
1 7 w
2 2 11
1 8 o
1 9 r
1 10 l
1 11 d
2 1 11
输出样例：
667718262
953066461
937670535
0
3