Problem J
Power Link

There are N power generators and M appliances. The i^{th} generator produces a power of A_i. The j^{th} appliance is connected to a set of generator S_j and gets its energy from them. Let C_j be the number of generators in S_j.

The energy obtained by each appliance can be calculated with the following formula.

$$\sum_{1 \leq a < b \leq C_j} A_{S_j[a]} \cdot A_{S_j[b]}$$

For example, let's say an appliance gets its energy from 4 generators and each of them produces 10, 5, 20, and 5 of power, respectively. The energy obtained by this appliance is $10 \cdot 5 + 10 \cdot 20 + 10 \cdot 5 + 5 \cdot 20 + 5 \cdot 5 + 20 \cdot 5 = 50 + 200 + 50 + 100 + 25 + 100 = 525$.

For the next Q days, you will perform one of these two operations.

1. Change the power produced by the i^{th} generator to X.
2. Report the energy obtained by the j^{th} appliance.

For each operation of the second type, output the energy obtained by the j^{th} appliance.

Input

Input begins with a line containing two integers: N M $(1 \leq N, M \leq 100\,000)$ representing the number of power generators and the number of appliances, respectively. The next line contains N integers: A_i $(1 \leq A_i \leq 10\,000)$ representing the power produced by the generators initially. The next M lines each begins with an integer C_j $(1 \leq C_j \leq N)$ representing the number of generators that are connected to the j^{th} appliance, followed by C_j integers: $S_j[k]$ $(1 \leq S_j[k] \leq N)$ representing the connected generators. For all j, the generators in S_j are guaranteed to be unique. The sum of all C_j is not more than $200\,000$.

The next line contains an integer: Q $(1 \leq Q \leq 100\,000)$ representing the number of days. The next Q lines each contains one of the following input format representing the operation you should perform.

- 1 i X $(1 \leq i \leq N; 1 \leq X \leq 10\,000)$
  Change the power produced by the i^{th} generator to X.
- 2 j $(1 \leq j \leq M)$
  Output the energy obtained by the j^{th} appliance.

There will be at least one operation of the second type.

Output

For each operation of the second type in the same order as input, output in a line an integer representing the energy obtained by the j^{th} appliance.

Sample Input #1

```
3 2
1 2 3
3 1 2 3
2 1 3
5
2 1
2 2
1 2 10
2 1
2 2
```

Sample Output #1

```
11
3
43
3
```

Explanation for the sample input/output #1

There are 3 generators and initially, each of them produces 1, 2, and 3 of power, respectively.

- `2 1`
  The energy obtained by the 1^{st} appliance is $1 \cdot 2 + 1 \cdot 3 + 2 \cdot 3 = 2 + 3 + 6 = 11$.
- `2 2`
  The energy obtained by the 2^{nd} appliance is $1 \cdot 3 = 3$.
- `1 2 10`
  Change the power produced by the 2^{nd} generator to 10. The power produced by the generators then become 1, 10, and 3, respectively.
- `2 1`
  The energy obtained by the 1^{st} appliance is $1 \cdot 10 + 1 \cdot 3 + 10 \cdot 3 = 10 + 3 + 30 = 43$.
- `2 2`
  The energy obtained by the 2^{nd} appliance is $1 \cdot 3 = 3$.