Game Show

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	256 megabytes

You receive an invitation to participate in a game show, where you encounter a playing field scattered with n balls. Each ball is labeled with a unique identifier i and has an associated value v_i (note that v_i can be negative). Your objective is to collect a subset of these balls, place them in your bag, and maximize your earnings by the end of the game. The earnings are calculated as $\max(0, \sum_{i \in S} v_i)$ dollars, where S is the set of balls you've chosen. To add a twist to the game, there are m additional rules, each falling into one of the following categories:

- If you pick up ball i but not ball j, you will incur a penalty of x dollars.
- If you pick up ball i, you are required to also pick up ball j.

Your task write a program that determines the optimal set of balls to collect in order to maximize your prize money.

Input

The first line contains two integers n, m

The next line contains n integers $v_1, \cdots, v_n$

The following m lines contains two possibilities

1. `1 i j x`
2. `2 i j`

Constraints

- $2 \leq n \leq 10^5$
- $1 \leq m \leq 10^5$
- $|v_i| \leq 10^9$
- $1 \leq x_i \leq 10^9$
- $i \neq j$ for all rules, but it is possible to have same (i, j) for different rules

Output

In the first line, output the maximum prize you can get.

In the second line, output a single integer, representing the number of balls you picked up.

In the third line, output the indices of the balls that you picked up (any order is fine).

There might be multiple correct answer, you will get the points if you output any of them.

Scoring

The following are the scoring criteria for this problem. The maximum score is 100, and you will receive the score for each subtask if your program passes that subtask.

Subtask	Constraints	Score	Additional Constraints
1	Example test case	0	None
2	$n \leq 10$	20	None
3	$n, m \leq 100$	20	None
4	$n, m \leq 10^4$	30	Must pass subtasks 2, and 3
5	No additional Constraints	30	Must pass subtasks 1, 2, 3, and 4

Examples

standard input	standard output
5 3 5 -2 3 -4 8 2 1 4 1 5 3 1 2 1 2	11 2 3 5
10 6 10 20 -50 1 2 40 -6 8 9 -5 2 1 3 1 6 3 100 1 2 4 5 1 2 5 6 2 10 8 2 5 6	40 8 2 4 5 8 9 6 3 1
5 1 -1 -2 -3 -4 -5 2 1 2	0 0