Task museum

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Elena works as a guide at the Shumen Regional History Museum. Each day, Elena gives at most K tours. The museum consists of N rooms numbered from 1 to N and M two-way corridors between them. The time required to traverse each corridor is known. It is guaranteed that there are no corridors connecting a room to itself, and every pair of rooms is connected by at most one corridor.

Each tour starts from the entrance (room 1) and finishes at the exit (room N). The total time of the tour is equal to the sum of times for passing the corridors. Elena feels bored showing the same things repeatedly, so she chooses a shortest tour (with respect to total time) for the first group. For the next group, she chooses the next shortest tour different from the previous one, and so on. Note that a tour may revisit rooms, so there are infinitely many possible tours between room 1 and room N.

Now Elena asks for your help to find the K shortest tours from room 1 to room N. The tours must be different, meaning that either the number of visited rooms differs, or the sequence of visited rooms differs.

Implementation details

You should implement the function `find_tours`:

```
std::vector<int> find_tours (int N, int M, int K, std::vector<std::pair<
   int, int>> e, std::vector<int> t)
```

- N: the number of rooms in the museum;
- M: the number of corridors between the rooms;
- K: the number of tours;
- e: a vector of M pairs, representing the corridors;
- t: a vector of M positive integers, representing the times for the corresponding corridors.

This function will be called once for each test and has to return a vector with K numbers – the total times for the K shortest tours from room 1 to room N in non-decreasing order.

Constraints

- $2 \leq N \leq 10\,000$;
- $1 \leq M \leq 20\,000$;
- $1 \leq K \leq 75$;
- $1 \leq t[i] \leq 200\,000$ for each $1 \leq i \leq M$.

Subtasks

Subtask	Points	Required subtasks	N	M	K	Other constraints
0	0	–	–	–	–	The example.
1	13	–	≤ 10	≤ 45	≤ 75	It is guaranteed that none of the K tours revisit rooms.
2	28	–	$\leq 10\,000$	$\leq 20\,000$	$= 1$	-
3	59	$0 - 2$	$\leq 10\,000$	$\leq 20\,000$	≤ 75	-

Example

Consider the following call for $N = 3$, $M = 3$, and $K = 3$:

```
find_tours(3, 3, 3, {{1, 2}, {2, 3}, {1, 3}}, {3, 2, 5})
```

The 3 shortest tours between room 1 and room 3 are the following:

- $1 \xrightarrow{3} 2 \xrightarrow{2} 3$ for a total time 5;
- $1 \xrightarrow{5} 3$ for a total time 5;
- $1 \xrightarrow{3} 2 \xrightarrow{2} 3 \xrightarrow{2} 2 \xrightarrow{2} 3$ for a total time 9.

Therefore, the call should return `{5, 5, 9}`.

Sample grader

The input format is the following:

- line 1: three integers – the values of N, M, and K.
- line $1 + i$: three integers x_i, y_i, t_i – representing a corridor between the rooms x_i and y_i with passing time equal to t_i.

The output format is the following:

- line 1: the total times for the tours as returned by the call.