Problem 4 - The big party

R-Boy is very happy of his last party, remember the sandbox? He's now asking you to help him again. This time, R-Boy doesn't simply want to host a party: he wants to bring his friends on a tour of **X** different parties in multiple cities of his country.

The country is composed by **N** cities connected by **M** bidirectional roads, in such a way that between every pair of cities there exists at least one path of roads that connects them. Each road has some cost that must be paid everytime it is used. Similarly, each city has some cost to let you host one party there.

The tour must start and finish from the city R-Boy lives in (the one with index **0**); the participants will move together, across the existing roads, to the **X** selected cities that will host the parties.

Note that is possibile to give more than one party in the same city; it is also possibile to host a party in the starting city **0**. The only restriction is that, in order not to bore participants, between one party and the next they have to move on at least one road.

Help R-Boy to find the cost of the cheapest tour consisting of **X** parties across its country!

Input data

The first line of the input file contains an integer **T**, the number of test cases to solve, followed by **T** testcases, numbered from **1** to **T**.

In each test case the first line contains the three integers **N**, **M** and **X**: the number of cities, the number of roads and the number of parties R-Boy wants to organize.

The second line contains the array **C** of **N** integers, where **C**[i] correspondes to the cost of organizing a party in the i-th city (for each $0 \leq i < \mathbf{N}$).

Each of the following **M** lines contains three integers **u**, **v**, **c** meaning that a road exists between cities **u** and **v**, having a cost **c**.

Output data

The output file must contains **T** lines. For each test case in the input file, the output file must contain a line with the words:

Case #t: c

where *t* is the test case number (from **1** to **T**) and *c* is the cost of the cheapest tour.

Constraints

- $1 \leq \mathbf{T} \leq 20$.
- $1 \leq \mathbf{N} \leq 1000$.
- $1 \leq \mathbf{M} \leq 10\,000$.
- $1 \leq \mathbf{X} \leq 100$.
- $1 \leq \mathbf{C}[i] \leq 100$ for $0 \leq i < \mathbf{N}$.
- For each road it will hold $0 \leq \mathbf{u}, \mathbf{v} < \mathbf{N}$ and $1 \leq \mathbf{c} \leq 100$.
- Any two cities are directly connected by at most one road, and no road connects a city with itself.

Scoring

- **input 1** : $\mathbf{T} = 1$, $\mathbf{N} \leq 10$ and $\mathbf{X} = 1$.
- **input 2** : $\mathbf{T} = 5$, $\mathbf{N} \leq 100$ and $\mathbf{X} = 1$.
- **input 3** : $\mathbf{T} = 10$, $\mathbf{N} \leq 500$ and $\mathbf{X} = 2$.
- **input 4** : $\mathbf{T} = 15$, $\mathbf{N} \leq 1000$ and $\mathbf{X} \leq 10$.
- **input 5** : $\mathbf{T} = 20$, $\mathbf{N} \leq 1000$ and $\mathbf{X} \leq 100$.

Examples

input	output
2 4 3 1 10 6 1 4 0 1 2 1 2 2 1 3 3 4 3 2 10 6 1 4 0 1 2 1 2 2 1 3 3	Case #1: 9 Case #2: 14

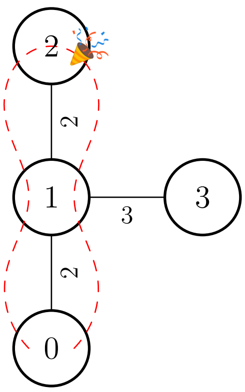
Explanation

In the first test case we only have to organize one party, so we can decide between:

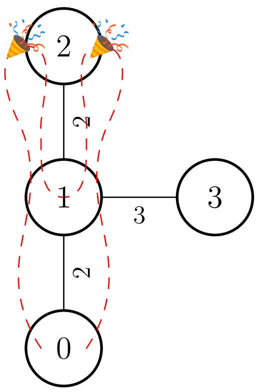
- City **0**, travelling cost of **0** and party cost of **10**, total cost of **10**.
- City **1**, travelling cost of **4** (tour: 0-**1**-0) and party cost of **6**, total cost of **10**.
- City **2**, travelling cost of **8** (tour: 0-1-**2**-1-0) and party cost of **1**, total cost of **9**.
- City **3**, travelling cost of **10** (tour: 0-1-**3**-1-0) and party cost of **4**, total cost of **14**.

The cheapest solution is thus **9** (by hosting the party in the city **2**).

In the second test case we have the same country as before but we have to organize two parties. The cheapest tour is in this case 0-1-**2**-1-**2**-1-0, where we have a travelling cost of **12** and the two parties cost $2 \times 1 = 2$, for a total cost of **14**. (Note that, as it is not possible to host more parties in the same city without moving, we have to move across the path **2**-1-**2**).



The first test case.



The second test case.