Railroad Map

adapted from a problem by Lukáš Poláček

The national railway company wants to update the railroad map to make it as simple as possible. So they decide to represent each single railroad as a single line by removing pure pass-through stations. However, all lines must remain indicated in the map with their actual total length. In other words, the simplified map must not contain stations that have exactly two other direct connections to other stations (i.e., a single railroad passing through the station) and that are not necessary to represent any railroad.

You will be given the complete railroad map consisting of railway stations numbered from 1 to N and railroad segments between some pairs of these stations. For each railroad segment you are also given its length. Your task is to output the new map.

Input

The first line of the input file contains an integer $T \leq 10$ specifying the number of test cases. Each test case begins with a line with two integers N and M, with $1 \leq N \leq 50000$ and $1 \leq M \leq 100000$. The number N denotes the number of stations and M is the number of railroad segments. M lines follow, each with 3 integers a, b, ℓ $(1 \leq a, b, \leq N)$ specifying that there is a railroad segment of length ℓ connecting stations a and b.

Output

For each test case, the first line of output must contain a positive integer K indicating the number of railroads in the simplified map. Each of the next K lines contains three integers a, b, ℓ, with $a \leq b$, stating that there is a railroad (possibly traversing multiple other stations) of total length ℓ between stations a and b. To avoid ambiguities, whenever a railroad line can be identified by multiple stations, the simplified map must use the station with the lowest numeric identifier. Also, the K railroads of the simplified map must be listed in order, such that each line a, b, ℓ can only be followed by lines a', b', ℓ' such that $a' > a$ or, if $a' = a$ then $b' > b$ or, if $a' = a$ and $b' == b$, then $\ell' > \ell$.

Examples

Sample input 1

```
2
3 2
1 2 1
2 3 1
4 4
1 3 1
2 3 2
3 4 3
4 2 1
```

Sample output 1

```
1
1 3 2
2
1 3 1
3 3 6
```

Limits

Time limit is 5 seconds.

Memory limit is 1024 megabytes.