# Chocolate

When thinking about chocolate, Lea usually gets happy. But not today! She has no more chocolate at home and all supermarkets near her home have "delivery problems". Of course she immediately calls the chocolate factory to find out what caused the problem. On the phone she is told that the lead organizer of chocolate transportation systems, Mr. D. I. Abetis is sick. Because no one else knows how to properly manage the conveyor belts that transport the chocolate from one production step to another, the whole production is on hold.

Lea has only one choice: She will go to the factory and solve the problem! At the factory, she is presented with the following situation:

There are multiple chocolate fountains from which warm chocolate springs in unlimited quantity. At these fountains, chocolate is cooled down and then transported to the wrapping station. This transport happens via a network of conveyor belts. Each conveyor belt has a maximum amount of chocolate it can transport per hour. Conveyor belts can end either at one of the fountains, at one of the wrapping stations, or at a distribution station. At a distribution station, all chocolate that arrives via an incoming conveyor belt has to be distributed onto outgoing conveyor belts.

The running direction of each conveyor belt can be switched, so a belt between $a$ and $b$ can transport either from $a$ to $b$ or the other way. For simplicity, assume that the wrapping stations have no limit to the amount of chocolate they can wrap.

Given the network of conveyor belts, Lea has to figure out how much chocolate can be wrapped per hour without violating the maximum load on the conveyor belts.

## Input

The first line of the input contains an integer $t$. $t$ test cases follow, each of them separated by a blank line.

Each test case starts with four integers $n\ k\ m\ l$, the number of chocolate fountains $n$, distribution stations $k$, wrapping stations $m$ and conveyor belts $l$. $l$ lines follow describing conveyor belts, each containing three integers $v_i\ w_i\ c_i$ where $v_i$ and $w_i$ are locations and $c_i$ is the capacity of the conveyor belt connecting $v_i$ and $w_i$. The locations will be described by integers where 1 to $n$ are chocolate fountains, $n+1$ to $n+k$ are distribution stations, $n+k+1$ to $n+k+m$ are wrapping stations.

## Output

For each test case, output one line containing "Case #$i$: $d$" where $i$ is its number, starting at 1, and $d$ is the maximum amount of chocolate that can be wrapped per hour.

Each line of the output should end with a line break.

## Constraints

- $1 \leq t \leq 20$
- $1 \leq n, m \leq 100$
- $1 \leq k \leq 500$
- $1 \leq l \leq 50000$
- $1 \leq v_i, w_i \leq m + n + k$ for all $1 \leq i \leq l$
- $1 \leq c_i \leq 20$ for all $1 \leq i \leq l$
- The graph of locations is connected.

**Sample Input 1**

```
7
2 2 2 5
1 3 1
2 3 1
3 4 1
4 5 1
4 6 1

2 2 3 7
1 3 1
1 4 1
2 4 1
2 5 1
3 6 1
4 7 2
5 7 1

1 3 1 7
1 4 2
3 4 4
3 5 1
2 3 2
2 4 1
1 2 4
2 5 3

1 2 1 5
3 4 4
1 2 5
2 3 5
2 4 2
1 3 2

1 2 1 6
1 4 2
3 4 5
2 3 3
1 3 3
2 4 3
1 2 1

1 2 1 5
4 3 2
2 4 5
3 2 4
1 2 2
1 4 4

1 3 1 7
3 4 3
4 5 1
2 4 3
1 2 4
2 5 5
5 3 4
1 5 3
```

**Sample Output 1**

```
Case #1: 1
Case #2: 4
Case #3: 4
Case #4: 6
Case #5: 6
Case #6: 6
Case #7: 7
```

**Sample Input 2**

```
7
1 3 1 6
4 5 4
1 3 1
3 5 2
2 4 3
3 2 3
1 5 4

1 4 1 11
6 2 5
2 3 4
3 5 2
5 6 2
1 6 4
1 2 5
1 5 1
1 3 3
4 5 3
6 3 2
3 4 1

1 1 1 2
1 3 5
1 2 1

1 1 1 2
1 2 3
2 3 1

1 4 1 9
1 5 5
5 2 1
1 4 1
5 6 2
4 6 4
3 6 5
3 4 5
2 6 2
5 3 4

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

1 3 1 9
1 3 4
1 5 3
3 5 3
1 4 2
1 2 1
4 3 3
4 5 1
2 4 3
3 2 4
```

**Sample Output 2**

```
Case #1: 5
Case #2: 13
Case #3: 5
Case #4: 1
Case #5: 6
Case #6: 4
Case #7: 7
```