Escaping the Paradox

During a recent archaeological trip, Lea discovered a vast complex of underground tunnels connecting graves of an ancient civilisation. She spent a long time wandering around and drawing a map that captures all the graves and connections. Right now, she is deep below the surface, and has finally reached the last unexplored chamber, which is, disappointingly, completely empty. "Must have been budget cuts" she is thinking, when suddenly a distant feeling of danger makes her feel uneasy. Only an instant later, she knows with absolute certainty the source of the feeling: It is herself. Or, her future self, to be exact.

She does not yet know why she would want to use a time machine to come back here from the future, but basic knowledge of time travel is of course to never interact with yourself from another time. Luckily, she knows exactly where her future self is right now: Only one of the caves is big enough for the time machine. Now she has to figure out how she can escape to the surface without any chance of running into her clone. Her first decision is to always run towards the surface. Of course this problem is not that hard, but Lea also wants to take as many objects of the ancient civilization with her as possible. Luckily, her map includes a list of the objects in each room. How many objects can she take with her on her way to the surface while making sure there is no way to run into herself?

Lea and her future self need the same time to move the same distance and Lea has to take a way so that it is never possible for her and her future self to be in the same location at the same time. In particular Lea has to exit to the surface before her future self can do so. Furthermore, tunnels are undirected for future Lea, but Lea can only move in direction of the surface, that is, to graves with smaller indices.

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 three integers n, m, and g, the number of graves n, the number of tunnels m and the grave g where Lea's future self starts. Graves are indexed from 1 to n where n is the grave where Lea is right now. The following line contains n integers $o_1 \dots o_n$, o_i is the number of objects in grave i. m lines follow describing the tunnels, the j-th line contains three integers x_j y_j l_j. x_j and y_j are either grave indices or 0 (the surface) meaning that there is a tunnel between x_j and y_j of length l_j.

Output

For each test case, output one line containing "Case #i: x" where i is its number, starting at 1, and x is either the maximal number of objects Lea can take with her on the way to the surface (may be 0) or "impossible" if she cannot escape her future self. Each line of the output should end with a line break.

Constraints

- $1 \leq t \leq 20$
- $1 \leq n \leq 500$
- $1 \leq m \leq 5000$
- $1 \leq g \leq n$
- $0 \leq o_i \leq 50$ for all $1 \leq i \leq n$
- $1 \leq l_j \leq 50$ for all $1 \leq j \leq m$
- $0 \leq x_j, y_j \leq n$ for all $1 \leq j \leq m$
- The graph is connected.

Sample Input 1

```
2
3 3 2
1 1 1
0 1 1
1 3 1
1 2 2

3 3 2
1 1 1
0 1 1
1 2 1
1 3 2
```

Sample Output 1

```
Case #1: 2
Case #2: impossible
```

Sample Input 2

```
4
2 6 1
2 0
2 1 6
1 0 6
1 2 6
2 1 6
2 2 7
0 0 4

4 5 2
2 2 3 3
0 4 4
4 1 2
1 3 6
3 2 6
3 4 7

4 7 3
2 2 1 0
0 1 6
1 2 7
0 4 6
4 3 6
0 4 7
4 4 2
0 3 6

4 7 3
3 4 0 3
2 4 4
2 3 6
4 1 3
1 0 6
1 0 7
1 1 6
0 0 2
```

Sample Output 2

```
Case #1: impossible
Case #2: 3
Case #3: impossible
Case #4: 6
```