Routes

A consultant earns an amount **K** per hour of his time. He has to fly from city A to city B spending the least cost. Every hour that he spends traveling or waiting in an airport for connecting flights, he is losing an amount **K**. Assume that layover time between connecting flights is always one hour. Given inputs as **N** - the number of cities, **X** – the number of routes between cities (not all cities are necessarily connected), costs and time of flights between two cities for **X** routes (same in both directions), the source city number **S** and the destination city number **D** , please output the most optimal route *S->[any intermediate cities]->D*, total time in hours **T** and total cost **C** (including opportunity cost of lost earnings).

Input format:

The first line contains **K**.

The second line contains **N**.

The third line contains **X**.

Next **X** lines contain **X** route quadruplets involving source city number, destination city number, flight time and flight cost

Next line contains **S**.

Next line contains **D**.

Output format:

Print the optimal route in the follow format:

S->[C1->C2->... ->Cy]->D T C

If there is no route possible or if any of the constraints is failing, print **Error**.

Constraints:

$1 \leq X \leq \frac{N*(N-1)}{2}$

$1 \leq K \leq 1000$

$1 \leq S, D \leq N$

Sample Input

```
1000
4
5
1 2 1 2500
1 3 1 3000
1 4 2 7000
2 4 1 3000
3 4 1 2000
1
4
```

Sample Output

```
1->3->4 3 8000
```

Question 1 Max. Marks 100.00

Fill the boxes

You are given an array of size *N*, denoting capacity of N boxes, and an integer *K*, denoting extended capacity factor. You are also given the weights of *M* balls. Each i^{th} box can accommodate exactly one ball having weight in range $[capacity_i, capacity_i + K]$ (both inclusive). Find the maximum number of boxes that can be filled.

Constraints:

- $1 \leq T \leq 50$
- $1 \leq N, M \leq 10000$
- $1 \leq K \leq 1000$
- $1 \leq Capacity_i \leq 1000$
- $1 \leq Weight_i \leq 2000$

Input format:
First line: T i.e. Number of test cases.
For each test case:
First line: Three space-separated integers N, M and K.
Second line: N space-separated integers denoting the capacity of boxes.
Third line: M space-separated integers denoting the weight of balls.

Output format:
For each test case, print the answer in a separate line.

Sample Input

```
1
3 2 1
1 4 3
6 2
```

Sample Output

```
1
```

Explanation

In best scenario we can put ball 2 in box 1 hence answer is 1.