

World Finals 2015

- [A. Costly Binary Search](#)
- [B. Campinatorics](#)
- [C. Pretty Good Proportion](#)
- D. Taking Over The World**
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Submissions	
Costly Binary Search	
8pt	Not attempted 20/25 users correct (80%)
19pt	Not attempted 16/17 users correct (94%)
Campinatorics	
6pt	Not attempted 25/25 users correct (100%)
21pt	Not attempted 23/25 users correct (92%)
Pretty Good Proportion	
5pt	Not attempted 26/26 users correct (100%)
22pt	Not attempted 10/18 users correct (56%)
Taking Over The World	
7pt	Not attempted 20/21 users correct (95%)
29pt	Not attempted 3/4 users correct (75%)
Merlin QA	
8pt	Not attempted 14/19 users correct (74%)
30pt	Not attempted 4/8 users correct (50%)
Crane Truck	
8pt	Not attempted 2/3 users correct (67%)
37pt	Not attempted 0/1 users correct (0%)

Top Scores	
Gennady.Korotkevich	155
rng..58	134
bmerry	104
tczajka	96
vepifanov	96
peter50216	96
tkociumaka	96
linguo	92
simonlindholm	77
pashka	76

Problem D. Taking Over The World

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the [Quick-Start Guide](#) to get started.

Small input  
7 points

Solve D-small

Large input  
29 points

Solve D-large

Problem

You and your friend Pinky have a plan to take over the world. But first you need to disable a certain secret weapon.

It is hidden inside a twisted maze of passages (a graph) with one entrance. Pinky is going to be at the vertex with the secret weapon, disabling it. Meanwhile, a security team at the graph entrance will be alerted, and will run through the graph to try to get to Pinky in time to stop him. You are going to be slowing down the security team to give Pinky as much time as possible. It takes one unit of time to traverse any edge of the graph, but you can additionally "obstruct" up to **K** vertices. It takes one additional unit of time to traverse an obstructed vertex. You will choose to obstruct a set of vertices that slows down the security team by as much as possible.

If the security team will be starting at the graph entrance and is trying to get to the secret weapon vertex, how much time will it take them to get there? Note that you have to commit all your obstructions before the security guards start their journey, and the security guards will know which vertices you have obstructed and will choose an optimal path based on that information.

Obstructing the secret weapon vertex is not useful because that will not delay the guards any further after they have already caught Pinky. Obstructing the entrance, on the other hand, is obviously a good idea.

Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow. Each one starts with a line containing **N**, **M**, and **K**. The next **M** lines each contain a pair of vertices connected by an edge. Vertices are numbered from 0 (the entrance) to **N** - 1 (the secret weapon room). The first vertex will always be smaller than the second vertex, and no pair of vertices will appear more than once in the same test case. Edges are bi-directional -- the guards can travel along any edge in either direction.

Output

For each test case, output one line containing "Case #x: y", where x is the test case number (starting from 1) and y is the time it will take the security guards to get from the entrance to the secret weapon room.

Limits

1 ≤ **T** ≤ 100.  
2 ≤ **N** ≤ 100.  
1 ≤ **M** ≤ **N** \* (**N** - 1) / 2.  
1 ≤ **K** ≤ **N**.  
There will always be a path from room 0 to room **N** - 1.

Small dataset

It will not be possible to delay the guards by more than 2 time units, compared to the shortest unobstructed path length (using the given **K**).

Large dataset

No extra restrictions.

Sample

Input	Output
5	Case #1: 3
3 2 1	Case #2: 4
0 1	Case #3: 4
1 2	Case #4: 3
3 2 2	Case #5: 5
0 1	
1 2	
3 2 3	
0 1	
1 2	

```
4 4 2
0 1
0 2
1 3
2 3
7 11 3
0 1
0 2
0 3
1 4
1 5
2 4
2 5
3 4
3 5
4 6
5 6
```

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