

# Minimum Diameter Spanning Tree

Solve the minimum diameter spanning tree problem for the simple graphs.

For a given list of adjacent vertices of a graph  $G$  find the minimum diameter spanning tree  $T$  and write down the diameter of this tree  $\text{diam}(T)$ .

Each graph has only one connected component, so there is at least one spanning tree, which connects all the vertices.

## Input

$t$  [the number of test graphs]

Graph:

$n$  [ $1 \leq n \leq 1000$  the number of graph vertices]

$i \ m \ v_1 \ v_2 \ \dots \ v_m$  [the list of  $m$  adjacent vertices to vertex  $i$ ]

## Output

For each test case output:

$d$  [diameter of the minimum diameter spanning tree]

## Example

**Input:**

6

10

1 3 2 3 4

2 3 1 5 7

3 3 1 5 6

4 3 1 6 8

5 3 2 3 9

6 3 3 4 10

7 1 2

8 1 4

9 1 5

10 1 6

10

1 4 4 5 7 9

2 1 8

3 4 4 7 8 10

4 3 1 3 9

5 2 1 9

6 2 8 9

7 4 1 3 8 9

8 5 2 3 6 7 9

9 7 1 4 5 6 7 8 10

10 2 3 9

1

1 0

2  
1 1 2  
2 1 1

3  
1 1 2  
2 2 1 3  
3 1 2

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

**Output:**

5  
3  
0  
1  
2  
3