Problem 6: The Quest of Mango Tree Network in Pakistan

Time limit: 2 seconds

In the heart of Pakistan, nestled within the lush expanses of Multan's Mango Fields, lies a complex network of interconnected mango trees, where nature's intricate web has remained unchanged for centuries. This forest is home to a series of pathways, hidden and ancient, known only to the most seasoned adventurers. Over time, the inhabitants of nearby villages have passed down tales of this ancient network, yet no one has fully mapped its extent. Some say it connects two distant mango trees at the farthest ends of the network, but no one has returned with definitive proof.

The Sufi elders of Sindh have left a riddle to guide your journey: "To find the paths of the Great Mango Network, begin at the first tree you see. Traverse through all the trees until you reach the farthest ones. Only then will you uncover the truth of the Great Mango Path and its companion." At the same time, it is important to note the density of the two most connected trees, as this offers insight into the characteristics of a healthy tree and its potential for expansion.

Remember, true power lies not just in finding a single path, but in understanding the complexity and interconnectedness of the entire network. Your journey is about uncovering secrets, testing hypotheses, and perhaps discovering new insights along the way.

Input

The first line will be the number of test cases. In the second line the number of mango trees should be entered. Followed by lines for each edge ***(Vertex_1 Vertex_2)***.

- **Number of Vertices (*V*)**: ***2 <= V <= 1000***
- **Number of Edges (*E*): *E = V - 1***
- **Edge Constraints**:
  - Each edge connects two different vertices ***u*** and ***v*** where ***0 <= u, v < V*** .
  - There are no duplicate edges, and all edges are undirected.

Output

The output in one line shows the three integers

- Depth of the forest
- First and second highest connected trees in the forest.

Sample input & output

The following is an example of a sample input and corresponding correct outputs.

Sample input	Sample Output
1 5 0 1 0 2 0 3 0 4	2 4 1