# Step-1
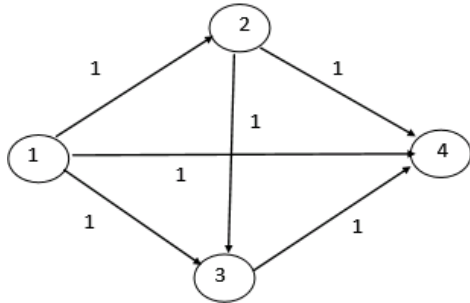
Let us consider the following network with the capacity of each edge is 1



# Step-2

**It is observed that the number of path from 1 to 4 is 3.**
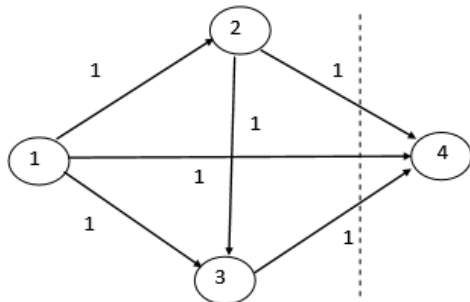
# Step-3

Let us find the maximum flow along the various paths of the node 1 and 4 as shown below.

| Path | Maximum flow |
|------|------|
| Node 1-4 | 1 |
| Node 1-2-4 | 1 |
| Node 1-3-4 | 1 |
| Total | 3 |

**Thus, it is observed the maximum flow is** $\boxed{3}$

# Step-4

Let us consider the network with the minimum number of edges whose removal disconnects node 1 from node 4

**Removal of 2-4, 1-4, and 3-4 disconnects 1 from 4.**

**Also it is observed that the minimum cut for the above network is 3**

Therefore, we can conclude that the maximum number of paths from $s$ to $t$ with no common edges equals the minimum number of edges whose removal disconnects $s$ from $t$.

**And then maximum flow = minimum cut**