SPANNING TREES
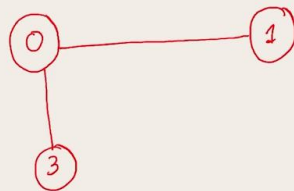
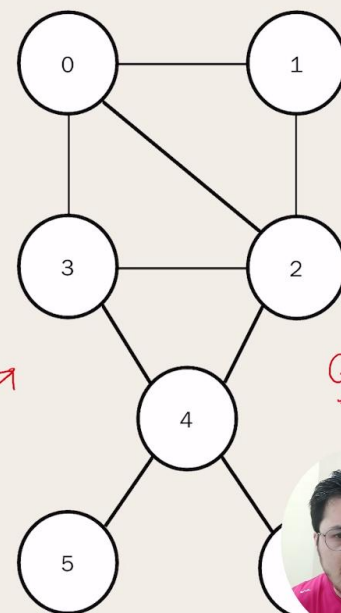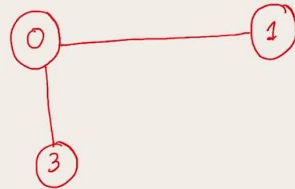## Subgraphs

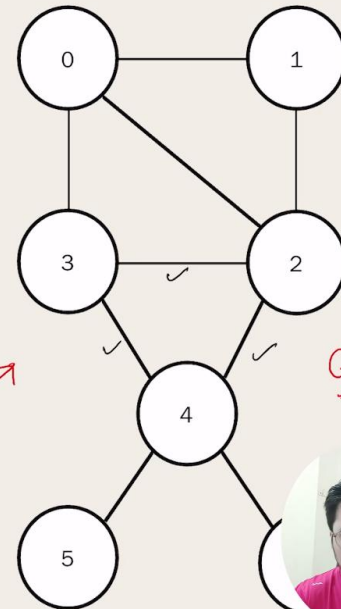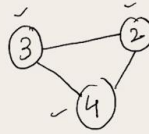- A subgraph of a graph G is a graph whose vertices and edges are subsets of the original graph G.

Subgraphs

■ A subgraph of a graph G is a graph whose vertices and edges are subsets of the original graph G.
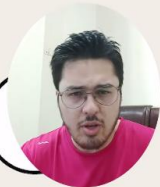

Connected and Complete Graphs

■ A **connected graph** is graph that is connected in the sense of a topological space, i.e., there is a path from any point to any other point in the graph. A graph that is not connected is said to be disconnected.

■ A **complete graph** is a simple undirected graph in which every pair of distinct vertices is connected by a unique edge

Quick Quiz:

■ Is the graph on the right a connected graph?

■ Is it a complete graph?
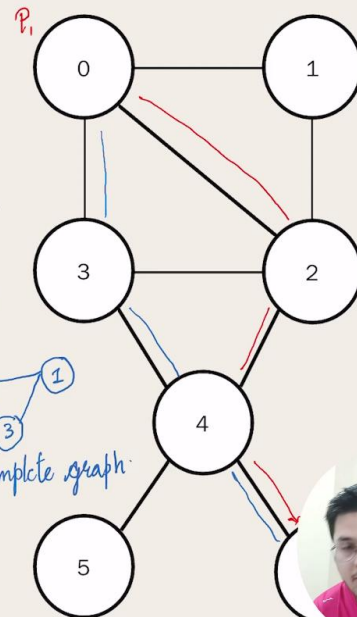
What is a Spanning Tree?

- A subgraph of a graph G is a graph whose vertices and edges are subsets of the original graph G.
- A **Connected subgraph** 'S' of Graph G(V, E) is said to be a **Spanning tree** of graph G iff (if and only if):
  1. *All vertices of G must be present in S*
  2. *No of edges in S should be V-1*

1> Sub graph ✓
2> Connected ✓
3> Cond^n 1 ✓
4> Cond^n 2 ✓

✓ Satisfied

G

V-1 = 3

No of spanning trees for Complete Graphs

- A **complete graph** has n^{n-2} Spanning Trees where n is the number of vertices in the graph

Quick Quiz:

- Draw 3 spanning trees for the graph at the right
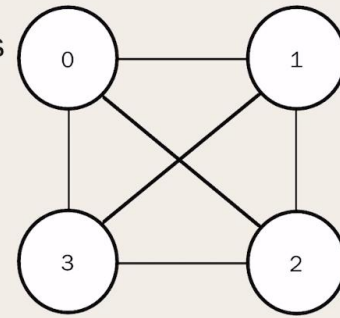
$$n^{(n-2)}$$

No of spanning trees for Complete Graphs

- A **complete graph** has n^{n-2} Spanning Trees where n is the number of vertices in the graph

Quick Quiz:

- Draw 3 spanning trees for the graph at the right