



SNS COLLEGE OF TECHNOLOGY

Coimbatore-37.

An Autonomous Institution



COURSE NAME : 23ITT201&DATA STRUCTURES

II YEAR/ III SEMESTER

UNIT – 4 MULTIWAY SEARCH TREE AND GRAPHS

Topic: Kruskal's algorithm

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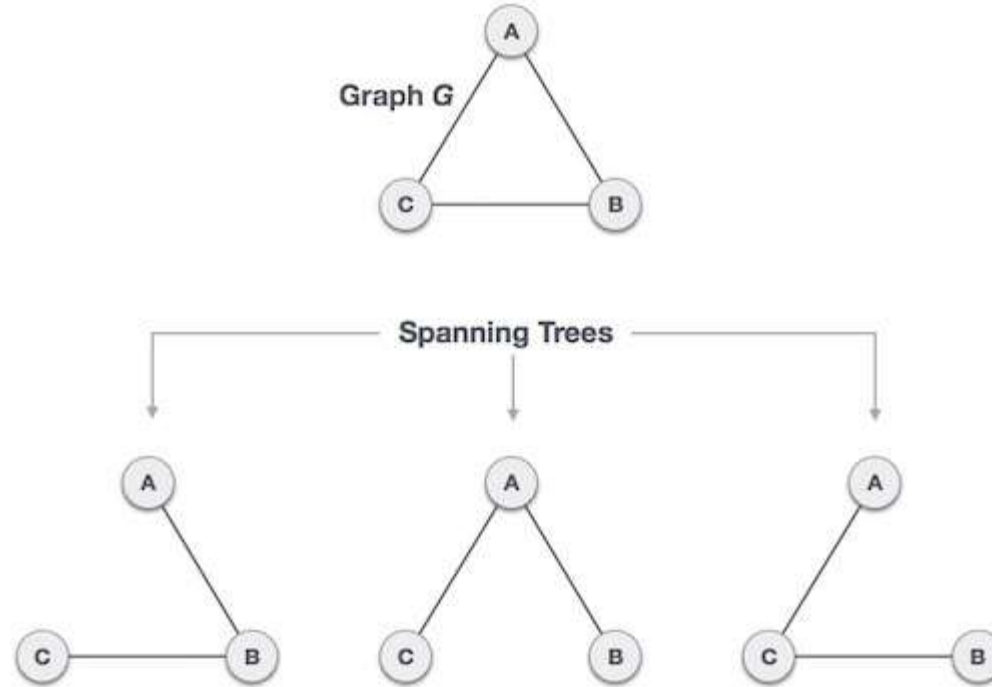
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Minimum Spanning Tree

- A spanning tree is a subset of Graph G, which has all the vertices covered with minimum possible number of edges. Hence, a spanning tree does not have cycles and it cannot be disconnected..





Minimum Spanning Tree

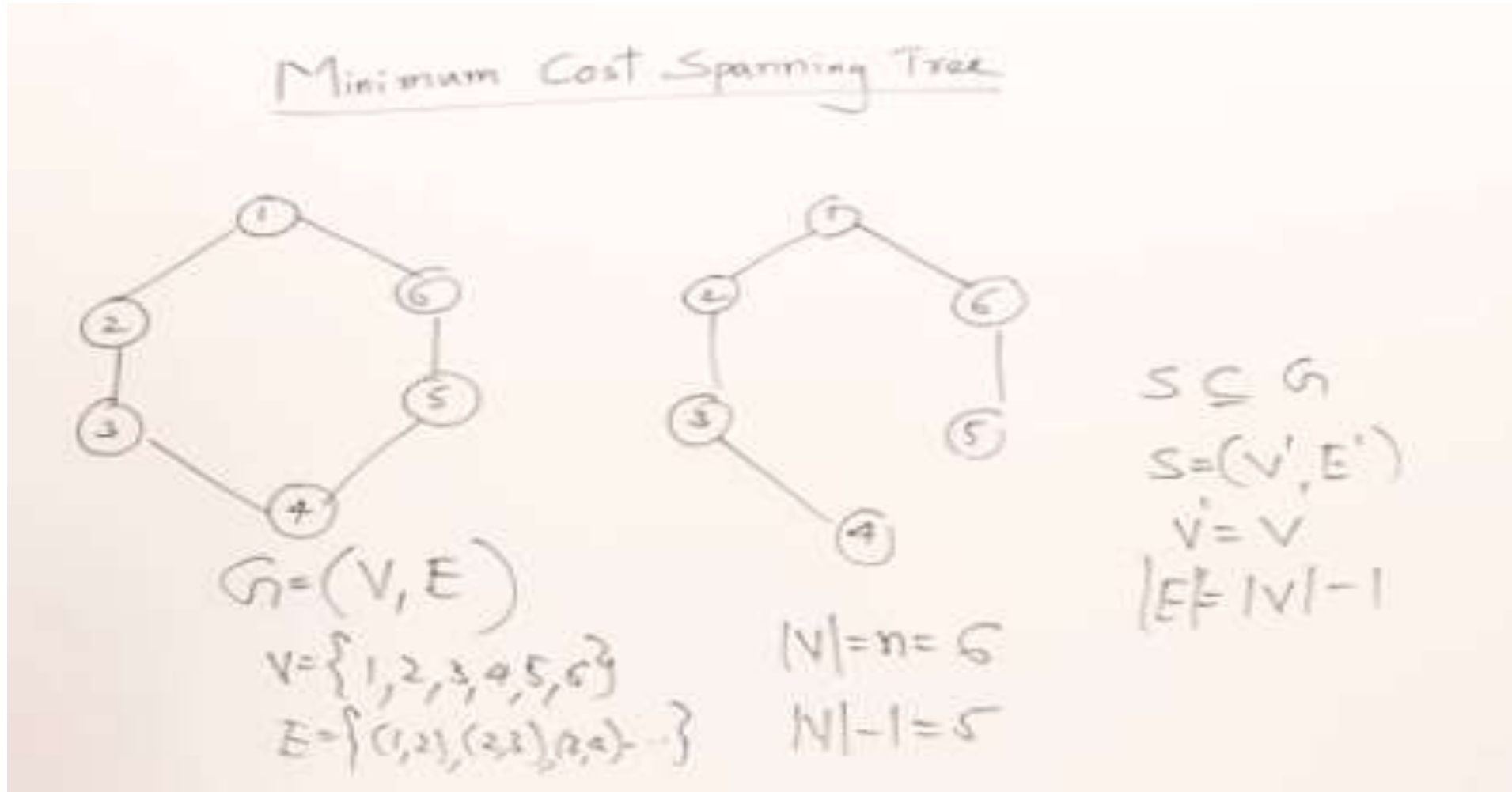
- Application of Spanning Tree
 - Civil Network Planning
 - Computer Network Routing Protocol
 - Cluster Analysis

Minimum Spanning Tree (MST)

- In a weighted graph, a minimum spanning tree is a spanning tree that has minimum weight than all other spanning trees of the same graph

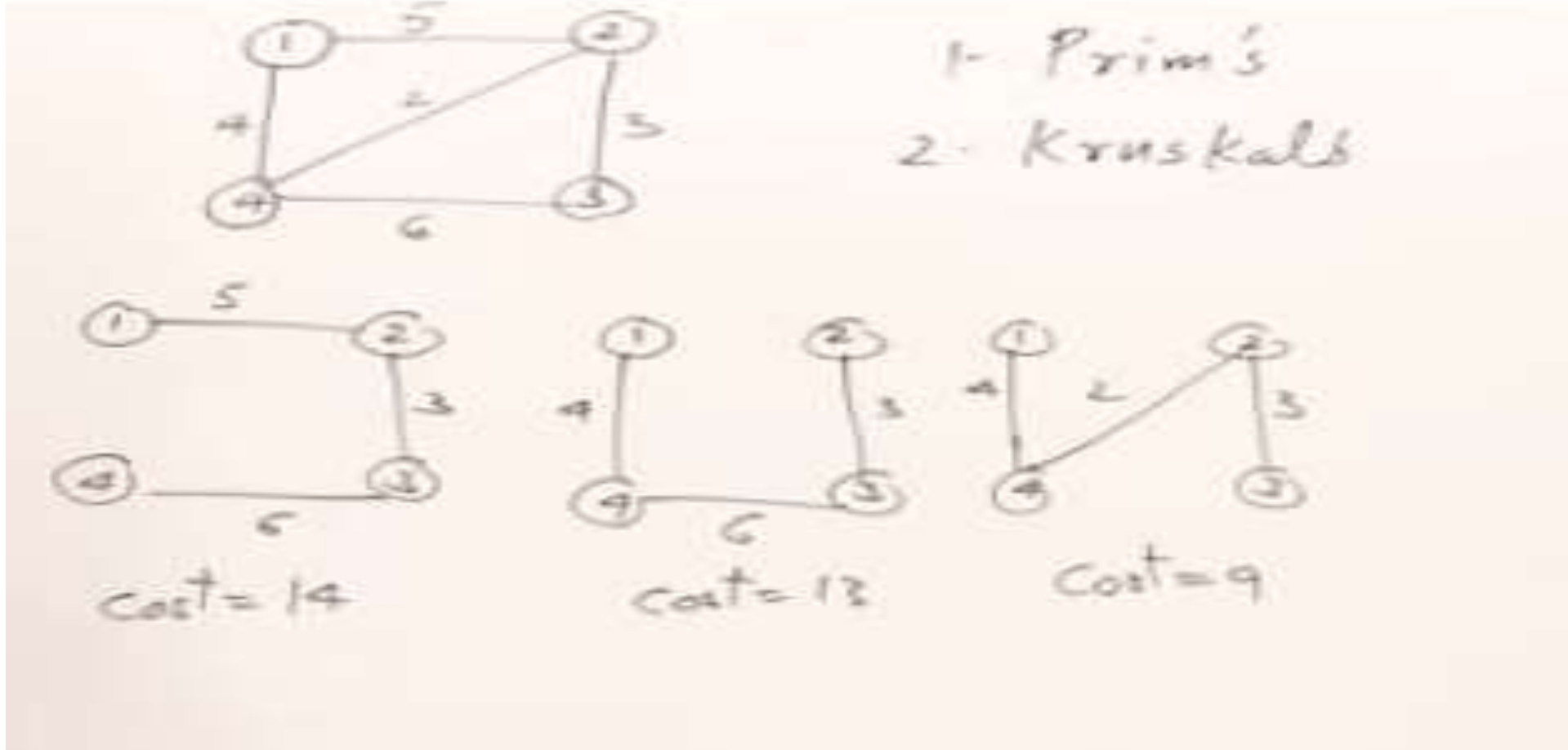


Minimum Spanning Tree





Minimum Spanning Tree





Kruskal's Algorithm

The steps to implement Kruskal's algorithm are listed as follows -

- First, sort all the edges from low weight to high.
- Now, take the edge with the lowest weight and add it to the spanning tree. If the edge to be added creates a cycle, then reject the edge.
- Continue to add the edges until we reach all vertices, and a minimum spanning tree is created.



Kruskal's Algorithm

Kruskal's Algorithm

M.S.T

- ① connected vertex (graph) ✓
- ② all vertices ✓
- ③ No cycles

	d,e	a,b	b,d	a,c	c,e	d,f	c,d	c,f	b,c
1	2	2	3	3	3	4	5	6	

Step 1:

Step 2:

Step 3:

$w_t = 2 + 2 + 3 + 3 + 1$



References

1. Anany Levitin, “Introduction to the Design and Analysis of Algorithms”, Pearson Education, 3rd Edition, 2012
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, “Fundamentals of Computer Algorithms”, Galgotia Publications, 2nd edition, 2003