Minimum Spanning Tree

Definition

Given an undirected and connected graph , a spanning tree of the graph is a tree that spans (that is, it includes every vertex of) and is a subgraph of (every edge in the tree belongs to)

practical applications are:

Cluster Analysis

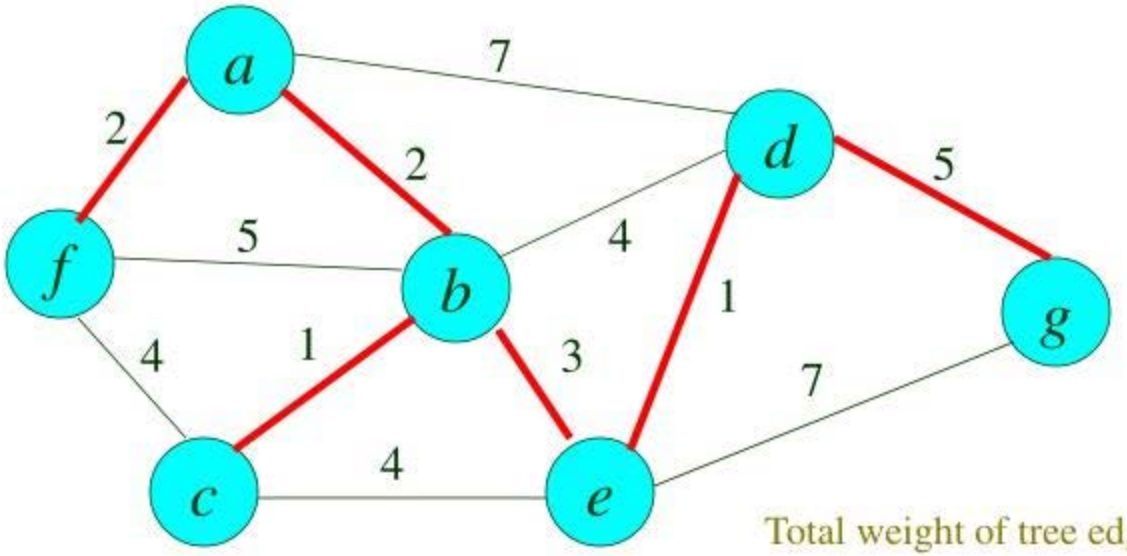
Handwriting recognition

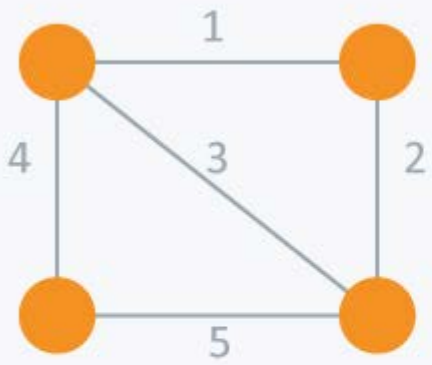
Image segmentation

Minimum Spanning Tree (MST)

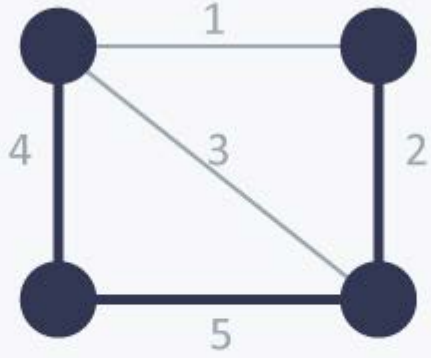
Problem Select edges in a connected and undirected graph to

- form a tree that connects all the vertices (*spanning tree*).
- minimize the total edge weight of the spanning tree.



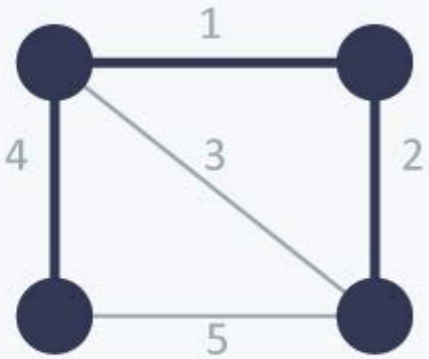


Undirected Graph



Spanning Tree

Cost = 11(=4+5+2)



Minimum Spanning Tree

Cost = 7(=4+1+2)

Two famous algorithms for finding the Minimum Spanning Tree:

Prim's Algorithm

Kruskal's Algorithm