Subject:Discrete Mathematics Topic:Prim's Algorithm

LISNA THOMAS ACADEMIC YEAR:2020-21

PRIM'S ALGORITHM

Prim's Algorithm

Prim's algorithm, discovered in 1930 by mathematicians, Vojtech Jarnik and Robert C. Prim, is a greedy algorithm that finds a minimum spanning tree for a connected weighted graph. It finds a tree of that graph which includes every vertex and the total weight of all the edges in the tree is less than or equal to every possible spanning tree.

Algorithm

- Initialize the minimal spanning tree with a single vertex, randomly chosen from the graph.
- Repeat steps 3 and 4 until all the vertices are included in the tree.
- Select an edge that connects the tree with a vertex not yet in the tree, so that the weight of the edge is minimal and inclusion of the edge does not form a cycle.
- Add the selected edge and the vertex that it connects to the tree.

Problem

Suppose we want to find minimum spanning tree for the following graph G using Prim's algorithm.



Solution

Here we start with the vertex 'a' and proceed.



No vertices added

After adding vertex 'a'







After adding vertex 'f'

This is the minimal spanning tree and its total weight is

(1+2+3+5+9)=20

Problem-01:

Construct the minimum spanning tree (MST) for the given graph using Prim's & Kruskal's Algorithm



Problem-02:

Construct the minimum spanning tree (MST) for the given graph using Prim's & Kruskal's Algorithm

