Minimum Spanning Tree Problem

Consider an undirected, connected network.

Problem Description

1. Given the nodes of a network but not the edges. We are gien the *potential edges* and the positive length for each if inserted into the network.
2. Design the network by inserting enough edges to satisfy the requirement that there be a path between every pair of nodes.
3. Objective: Satisfy the above requirement and minimize the total length of edges inserted into the network.

- A network with n nodes requires only $n - 1$ edges.

  Choose $n - 1$ edges such that the resulting network forms a *spanning tree*.

Algorithm

1. Select any node arbitrarily and connect it to the nearest node.
2. Identify the unconnected node that is closest to a connect node, then connect that node. Repeat until all nodes have been connected.
3. Ties for the nearest node can be broken arbitrarily. This may lead to the existence of multiple optimal solutions.