25/10/2021

Experiment 4: Dijkstra's algorithm

From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm. Write a program for it.

Algorithm

1. Create a set sptSet (shortest path tree set) that keeps track of vertices included in shortest path tree, i.e., whose minimum distance from source is calculated & finalized. Initially, this set is empty.
2. Assign a distance value of ∞ to all vertices in input graph. Initialize all distance value as infinite. Assign distance value as 0 for source vertex so that it is picked first.
3. While sptSet doesn't include all vertices:
   - Pick a vertex u which is not there in sptSet and has minimum distance value.
   - Include u to sptSet.
   - Update distance value of all adjacent vertices of u. To update the distance values, iterate through all adjacent vertices. For every adjacent vertex v, if the sum of distance value of u (from source) and weight of edge u-v, is less than the distance value of v, then update the distance value of