MSU CSC 325   Spring 2016
Assn 7. Improve an implementation of Dijkstra's Algorithm
Apr. 13, 2016
Due Apr. 21, 11:59pm

The provided code of this assignment implements Dijkstra's algorithm with a hardcoded graph.

Provided code is adapted from http://www.geeksforgeeks.org/greedy-algorithms-set-6-dijkstras-shortest-path-algorithm/ *which may not agree with CLRS textbook and may not be correct!*

Provided:

DijkstrasAlgorithm_GFG.cpp	C++ code
Graph_tiny.dat	Input file (see description below)
Graph_med.dat	Input file (see description below)
Graph_CLRS.dat	Input file (see description below)
Graph_g4g.dat	Input file (see description below)

All values in the data file are numeric, separated by spaces and lines. The data in the file is in the format:

Number of vertices. This value is an integer denoted by N.
x_i coordinate, y_i coordinate of vertex i, in the order $i=0, i=1, …, i = (N-1)$. (Coordinates are integers in the range 1 to 600. There are N pairs of (x, y) coordinates.)
Number of edges. This value is an integer denoted by E.
E sets of triples of numbers for each edge: edge's start vertex, edge's end vertex, and weight w of edge. Each edge's start vertex and end vertex are integers in the range 0.. $(N-1)$, weight w is a floating point number.

Your task: Modify the provided Dijkstra's algorithm by:
- Read graph data from a filename passed as the **first** command line argument.
- Read the destination vertex from an integer passed as the **second** command line argument.
- Create a graphic BearPlot file to display the edges selected. When these edges are displayed, they are a tree of the Shortest Path from the source vertex, v_0, to each other vertex. T*he edges on the displayed graph do not need to be labelled ---- only lines for the graph edges.*
- Write text on the graphic BearPlot display to show the length of the shortest path from the source vertex, v_0, to the destination vertex input on the command line.

You do not need to modify any of the technique of the provided code. Also, the provided code may not agree with CLRS textbook.

Turn in: Assn7_MyMSUID.cpp

Example input : Graph_g4g.dat, uses the example of the provided source code,
http://www.geeksforgeeks.org/greedy-algorithms-set-6-dijkstras-shortest-path-algorithm/
The graph below demonstrates that the provided source code is "buggy" – there are too many edges selected, making a GRAPH rather than a TREE.