

Project 2

ITCS 6114/8114

Fall 2012

Due November 27

Write a program to process a weighted undirected graph as follows:

1. Read in the number of vertices V and the number of edges E of the graph followed by its E edges, each in the form u, v, w where $1 \leq u, v \leq V$ & $w > 0$ representing an edge uv with weight w .
2. Set up and print the adjacency matrix representation of the Graph.
3. Determine whether the graph is connected.
4. Find a minimum spanning tree for each component and print the minimum spanning forest in adjacency matrix representation (regardless it has just one or more than one components).
5. If the graph is connected, use Priority-First Search to find a shortest path tree from vertex 1. Print the adjacency matrix representation of the tree.

You should document your program, analyze the complexity of your algorithms, and show the outputs from sample data sets that Mr. Zhou (TA) will provide you next week.