Homework #7
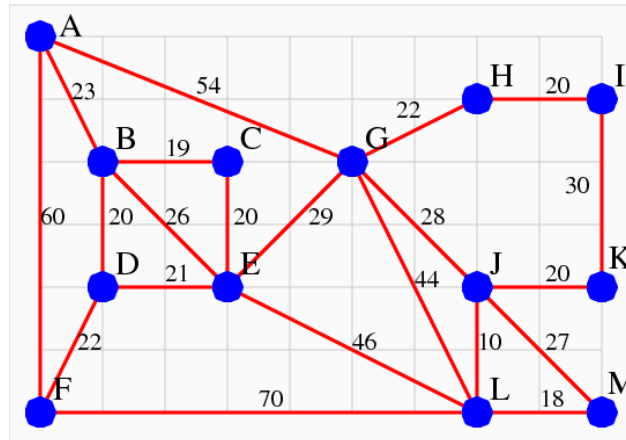Algorithms II
Due: Friday, 25 February 2011

Problem 1:

In class, we discussed *Dijkstra's algorithm* for computing the shortest path between two nodes of an edge-weighted graph.

Assume that you have been given the graph shown in the figure, and that you want to determine the length of the shortest path from node A to node L. Carry out, by hand, Dijkstra's algorithm.

1. At each step, state which edge is being selected, and why;

2. Once you have reached the destination, state the length of the shortest path.

Problem 2:

In class, we discussed the concept of the *minimum spanning tree* for a connected, edge-weighted graph, that is, a selection of some of the edges of the graph with the properties that:

- the graph is still connected using only the selected edges, **and**;

- the sum of the edge-weights is the minimum possible value.

Assume that you have been given the graph shown in the figure. Carry out, by hand, the steps of the minimum spanning tree algorithm.

1. At each step, list the edge you have selected;

2. At the end, state the total length of your selected edges.