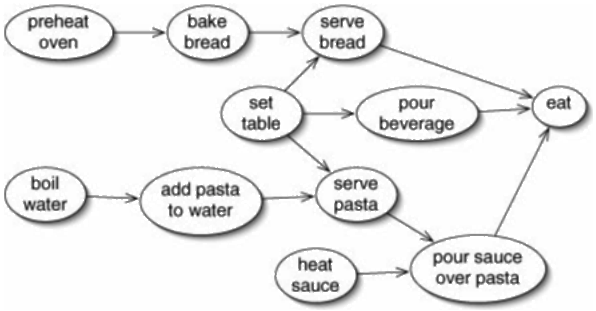
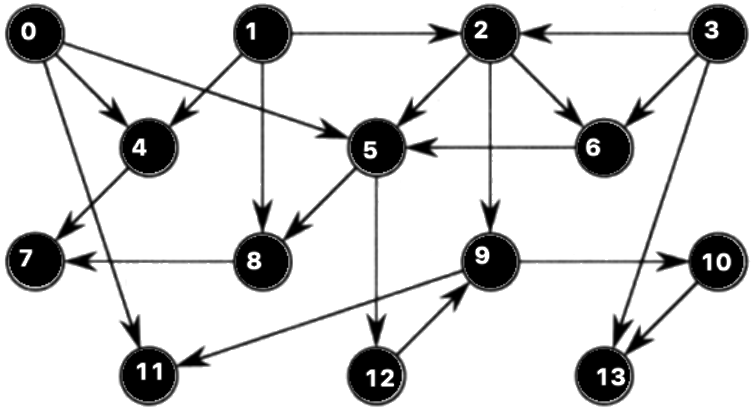
Assignment 8
Due December 4



1. Here is a directed graph with vertices numbered 0..13.



The attached file edges.txt contains the edges for the graph.

Write a program, **TopoSort.java**, that performs a topological sort on the graph. The vertices can represent any kind of task.

The constructor should build the appropriate data structure. You program should have another method, sort(), that does the topological sort.
Your main(..) method should consist of a two lines:

```
TopoSort top = new TopoSort();
Top.sort();
```

2. For this program, you will implement the algorithm that determines the shortest path between two points (or cities in this case) using the data that I laboriously entered from a cheap road atlas. **This program counts double (4 points).**

You can download the list of all city names here or at

http://web.stonehill.edu/compsci/CS211/Assignments/cityNames.txt

and the list of vertices and distances between the vertices (cities) here or at

http://web.stonehill.edu/compsci/CS211/Assignments/map.txt

Notice that to make the map easier to read with a Scanner, I used dashes rather than spaces in a name. For example *New York* is listed as *New-York*.

Also, the graph is NOT directed so each edge in the file really represents "two edges." For example, the entry

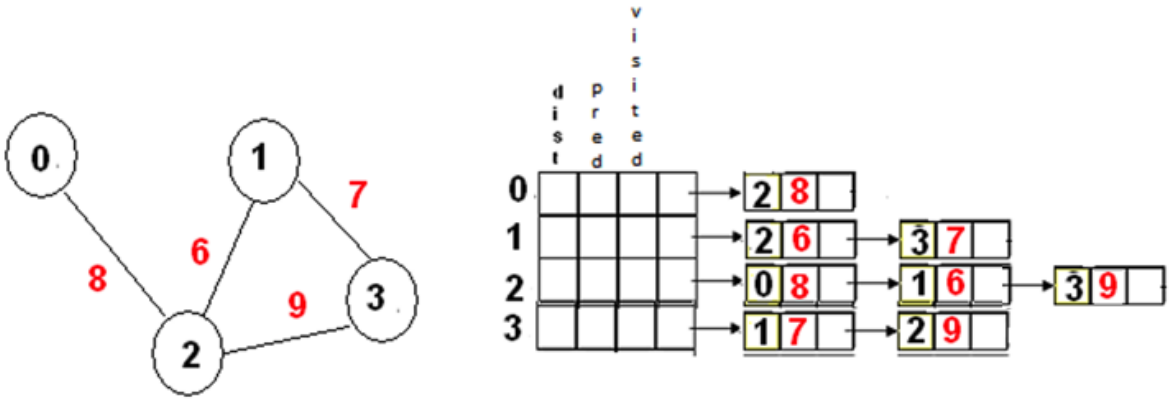
Boston Providence 52

means that

the distance from Boston to Providence is 52 miles and the distance from Providence to Boston is 52 miles.

Since you cannot index an array with the name of a city, you will have to deal with code numbers. For example, AERDEEN IS 0, ABILINE IS 1, AGUSTA IS 2, etc.

The data structure that we used to store the graph and the information about the path looks something like this. See the notes from class.



You will also need a minimum priority queue implemented as a heap.
Again notice that the city names are all upper case and contain dashes rather than spaces, where appropriate spaces (LOS-ANGELES, BOWLING-GREEN etc.)

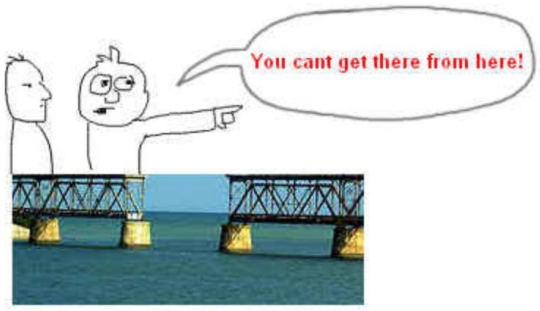
The program should run like this:

Enter starting and ending cities – XXX to exit
Start: **BOSTON**
End: **NEW-YORK**

The shortest route is
BOSTON HARTFORD 102
HARTFORD NEW-YORK 115
TOTAL DISTANCE 217

Start: **BISTON**
End: **HARTFORD**
Illegal entry.

Start: **XXX**
End: **XXX**
Bye


You cant get there from here!