COMP 410: Fall 2009
Final programming assignment.

Handed out on **Nov 16**   Due back on **November 30**

For this assignment, you are to (i) implement a graph object that is stored as an *adjacency-list*; and (ii) implement the Dijkstra shortest-path algorithm. You may assume that the vertices of your graph are identified by the integers $0, 1, \ldots, n-1$, and that all edge-weights are floating-point numbers.

The specifications of the graph are to be read from an input file by your program. This file has the following format:

```
n
u1 v1 w1
u2 v2 w2
...
um vm wm
-1
s
```

Here, n denotes the number of vertices in the graph. Each following 3-tuple denotes an edge, which is specified by its source-vertex, its destination-vertex, and its weight. The description of the graph is terminated by a 1. An integer s follows this -1; this is the "source" vertex for the Dijkstra shortest-path algorithm: you are to determine and print out the shortest path from this vertex s to every vertex in the graph.

Rules for submitting this program:

1. Recall that you are not permitted to work in groups all your work must be your own, and you must attest to this in a signed comment that begins each program.

2. Include a (neatly typed — not handwritten) design plan. This design plan should contain a detailed description of all algorithms you use. Include some general comments on the structure and layout of your assignment.

3. Include a complete listing of all your code, input files, and output files.

4. Your code must be appropriately commented – if we dont understand your code with reasonable effort, you get no credit for it.

5. Include a test plan detailing how you tested your program, and why you believe it is correct.

6. All of the above should be placed in an envelope with your name and student-ID on the outside, and submitted at the beginning of class on the due date.