

## ECE 325 - Iterative Methods

### Practical Assignment 11 (Due: 25/11/2019 – 13:00)

**Report and Executables:** Your report and executables should be sent via email to the lab teaching assistant ([gplast01@ucy.ac.cy](mailto:gplast01@ucy.ac.cy)), with subject **ECE 325 LAB 11 Team X** prior to the assignment examination date and must include a cover page with the statement that this is your own work together with the signatures of all students in the group. You should also list all other students that have helped you in completing the lab assigned as well as any references that you have used (e.g., websites where you found any information). In your report, include only the pseudocode, not the actual code, with any comments and description you may want to add, as well as typical scenarios that you use to test your programs.

#### Graph Algorithms:

Write a program that reads a file with a graph  $G=(V,E)$  with  $n$  nodes and the cost associated with every edge. The form of the file is the following:

$n$  % the number of nodes  
 $m$  % the number of edges  
 $n_1 n_2 c_1$  % where,  $n_1 n_2$  identifies the edge between nodes  $n_1$  and  $n_2$  while  $c_1$  is the cost of the edge

```
5
12
0 1 75
0 2 120
1 0 75
1 2 75
1 3 120
1 4 30
2 0 120
2 1 75
3 1 120
3 4 60
4 3 60
4 1 30
```

The user will then be given 3 options:

1. Find the shortest path between any pair of nodes using an algorithm of your choice (the user should enter the source and destination for the pair) [40 points]
2. Compute the minimum spanning tree of the graph [40 points]
3. Compute the length of the shortest path from any node to any other node and print it [20 points]
4. Exit