ETEC2101	Lab9: **Graphs**	Points: **100**

1. (**35 points**) Create a template (N, E) graph class that has this interface (you can choose any of the recommended structure ideas from the slides)
    a. **add_node**(N)
    b. **add_edge**(N start, N dest, E val)
    c. bool **contains_node**(N)
    d. bool **contains_edge**(N start, N dest)
    e. **remove_node**(N)
    f. **remove_edge**(N start, N dest)
    g. E **get_edge**(N start, N dest) // Should raise exception if no edge
    h. Some way to get all nodes and all neighbors of a node (iterator, functions, etc.) – it's also OK to use other tools we've written (ex. I used the UnorderedMap iterator to do this part)
    i. **<< operator** overload that produces output in "adjacency list" style (ex. slide3):

```
D |
A | (B:0.6) (F:1.3)
G | (B:0.1)
B | (R:2.5) (G:0.1)
R | (G:4.0)
F | (D:3.7) (G:2.8) (A:1.3)
```

    j. (you can define additional methods too!)
2. (**10 points**) Google tests of the above
3. (**5 points**) Good doxygen documentation of the above class
4. (**50 points**) Using our TextCircle class (from Lab7), have a method to load in a text file (see the sample on blackboard) and display it. This method should use the Graph class we just created.
5. (**+40 points**) Extend the functionality from #4 to allow the user to create and save a text file as show in this video: https://youtu.be/2woD-bX5SMw
6. (**+10 points**) Make an *interesting* (for pathfinding / exploration) map with your tool [or manually]