SE 2205: Algorithms and Data Structures for Object-Oriented Design
Lab 5
Assigned **March 20, 2019**.

1 Objectives

In this lab, you will first declare the following functions in an interface called `Graph`:

- `numVertices()`: Total number of vertices in the graph
- `vertices()`: Iteration of all the vertices in the graph
- `numEdges()`: Total number of edges in the graph
- `edges()`: Iteration of all the edges in the graph
- `getEdge(u,v)`: Returns the edge connected by vertices `u` and `v`
- `endVertices(e)`: Returns the vertices that form the edge `e`
- `opposite(v,e)`: Returns the other vertex of the edge incident to `v`
- `outDegree(v)`: Returns the number of outgoing edges from `v`
- `inDegree(v)`: Returns the number of incoming edges to `v`
- `outgoingEdges(v)`: Iteration of all the outgoing edges from `v`
- `incomingEdges(v)`: Iteration of all the incoming edges to `v`
- `insertVertex(v)`: Creates a new Vertex `v`
- `insertEdge(u,v,x)`: Creates a new Edge from `u` to `v` and store `x`
- `removeVertex(v)`: Deletes `v` and all the associated edges
- `removeEdge(e)`: Deletes edge `e` from the graph

Then, you will implement the `adjacencyListGraph` class in which the above functions are defined.