

# CSCI 310, Data Structures, Summer 2009

## Assignment 12 (30 points)

1. (20 points) Create a class to represent a graph  $G = (V, E)$ . Your class should provide methods for the following:
  - A constructor that takes the order  $n$  of the graph.
  - Add an edge to the graph.
  - Remove an edge from the graph.
  - Return the order of the graph.
  - Return the size of the graph.
  - Return the degree of a vertex.
  - Return the maximum degree of the graph.
  - Return the minimum degree of the graph.
  - Return the average degree of the graph.
  - Determine if two vertices are adjacent.
  - Return the neighborhood of a vertex.
2. (10 points) Write a test program for your graph class. This program should read a text file containing the specification for a graph. The file will begin with a single integer representing the number of vertices in the graph. The file will then contain pairs of integers representing edges.