CSC 430 GRAPH PROJECT

Implement a graph class using linked lists ( a dynamic array that stores vertices and, for each vertex, a linked list of edge nodes ).

The class should have the following methods:

1. A constructor
2. A copy constructor
3. A destructor
4. An addVertex method
5. An addEdge method
6. A deleteVertex method
7. A deleteEdge method
8. An isFull and isEmpty methods
9. A makeEmpty method
10. A getWeight method that returns the weight of an edge
11. A getVertices – given a vertex v it returns a queue of vertices adjacent to v
12. A resetVisited
13. A setVertexVisited
14. A bool method called isVisited

Remember to include a Visited array in your data members.

Write a menu-driven program to THOROUGHLY check your class and all the methods included in your program. You can choose the data type for the list. Allow the user to continue with operations as long as he/she wants to.

Your program should check if an operation is possible ( ex: check if list is empty before attempting to delete an item; check if list is full before attempting to insert an item…)

Your program should have the following methods:

1. A DFS method to perform a Depth First Search from a given vertex
2. A BFS method to perform a Breadth First Search from a given vertex
3. A shortestPath method that print the shortest path from a given vertex v to any other vertex
4. Additional methods that will make your program more structured.

Test your program thoroughly before submitting it.