CSCE 221 Cover Page
Programming Assignment #6
Due December 6 by 11:59 pm to CSNet

First Name Last Name UIN

User Name E-mail address

Please list all sources in the table below including web pages which you used to solve or implement the current homework. If you fail to cite sources you can get a lower number of points or even zero. According to the University Regulations, Section 42, scholastic dishonesty are including: acquiring answers from any unauthorized source, working with another person when not specifically permitted, observing the work of other students during any exam, providing answers when not specifically authorized to do so, informing any person of the contents of an exam prior to the exam, and failing to credit sources used. Disciplinary actions range from grade penalties to expulsion read more: Aggie Honor System Office

Type of sources			
People			
Web pages (provide URL)			
Printed material			
Other Sources			

I certify that I have listed all the sources that I used to develop the solutions/codes to the submitted work.

"On my honor as an Aggie, I have neither given nor received any unauthorized help on this academic work."

Your Name Date

Programming Assignment 6 Part 1(30 points)

In this assignment you are going to implement a graph structure. What you need to do is only to implement the functions in Graph.cpp. In your submission, please do not modify other code files except the Graph.cpp. The graph data structure can be used for other many algorithms in your future study and work.

Instructions

1. **Read the slides about the graph data structure and operations.**
2. Download the supplementary file with a sample code from the class webpage. **The sample code contains the implementation of DListNode that you are supposed to use. We provide a Graph.cpp. It has three blank functions that you need to implement. We use the Adjacency List data structure to store the graph.**
3. Compile your program using the Linux machine command line:

   ```
   g++ -std=c++11 *.cpp
   ```

   or

   ```
   make all
   ```

4. Run your program by executing

   ```
   ./main input_file (for example:  ./main test1.mat)
   ```

5. Input file format

   Please read the slides.

Points Distribution for Assignment

1. `(30 pt)Graph` Class Member Functions:
   (a) (10 pt) void buildGraph().
   (b) (10 pt) void insertEdge(itn i, int j, double w): insert a new edge into the adjacency list.
   (c) (10 pt) double getWeight(int i, int j): given the index of two vertices, return the weight of their edge.

Programming Assignment 6 Part 2(70 points)

In this assignment you are going to implement a Kruskal's Minimum Spanning Tree algorithm. What you need to do is only to implement the functions in Graph.cpp by using the disjointset.h from PA5. In your submission, please do not modify other code files except the Graph.cpp and disjointset.h. The graph data structure can be used for other many algorithms in your future study and work.

Instructions

1. **Read the slides about the graph data structure and operations.**
2. Download the supplementary file with a sample code from the class webpage. **Please use your implementation of disjointset from your PA5.**
3. Compile your program using the Linux machine command line:

   ```
   g++ -std=c++11 *.cpp
   ```

   or

   ```
   make all
   ```

4. Run your program by executing

   ```
   ./main input_file (for example:  ./main test1.mat)
   ```

5. Input file format

   Please read the slides.

Points Distribution for Assignment

1. `(40 pt)Graph` Class Member Functions:
   (a) (20 pt) void sortEdge().
   (b) (20 pt) double MSTAlgo(): Minimum Spanning Tree algorithm.
2. `(30 pt)Report`:
   (a) (10 pt) Program description, purpose of the assignment; details about your implementation of the five functions.
   (b) (10 pt) Provide runtime analysis of the five functions.
   (c) (10 pt) Show some testing results using screenshots.

Submission

1. "turnin" your tar file to the CSNET no latter than December 6 by 11:59 pm.