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CS 241

1) Requirements What did this project ask you to do? What was the input? How was the input processed? What was the output?

This project required us to override the newCost method from the GreedyGraph file. With the new overridden method, created a driver file that will compute the Minimum Spanning Tree and the Shortest Path Tree. A graph file is inputted as a terminal argument and the constructor for the Graph class is called. The driver file prints out the edges for the MST and SPT and along with their cost, the total distance for the SPT, and the minimal cost for the MST.

2. Method Describe the algorithm and data structures you used.

To find the SPT, I used ArrayList to keep track of the SPT because of its dynamic allocation properties. Also the program uses a single dimensional array for the edges of the graph. This whole project uses a Graph data structure.

The only difference between the tow newCost methods are the return values. For MST, the only thing that needs to be calculated is the overall cost which is the weight of the edges. For SPT, the weight of the edges and actual cost needs to be considered.

3. Implementation Describe the structure of your code and the packages used.

This project uses the Graph package provided from the professor. Within the package, there are programs to maintain the edges, vertex, and a GreedyGraph class. The greedyGraph class is a implementation of Dijsktra’s algorithm to find the shortest path from point A to point B.

4. Testing How did you make sure your implementation is correct?

To make sure that my program was producing the right results, I compared the output with the sample output. The only difference between my project output and the sample output is the shortest path taken order because my order is from end to start and the sample output is from start to end. But I don’t think there is a much difference because all of the edges visited are correct.

5. Findings What did you learn from this project? Graphs and analysis that might be required for this section.

From this project I learned to implement a Minimal Spanning Tree and a Shortest Path Tree from the given graph package. I learned a bit more on how to use the Graph package and its methods.