Data Structures and Algorithms

Homework # 5

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Question 1:

Please run code, refer to instructions on how to run on Sakai.

For this question we had to construct a directed graph and then test to see if there is a cycle that exists. A cycle being a path that returned to its origin path.

The results of our testing was that there indeed was a cycle in our test file "HW5-mediumEWG.txt"

Question 2:

Please run code, refer to instructions on how to run on Sakai. Also please view testing results txt file in folder to see test input cases and results.

For this question we had to construct a graph and run both Kruskal and Prims algorithm on both to construct a MST.

The results I got for both algorithms resulted in the same exact MST. The only difference was that the links are displayed v-w in part 1 but w-v in part 2 so it may seem like they are not the same result but if you look at the pair as a whole then it is.

Question 3:

Please run code, refer to instructions on how to run on Sakai. Also please view testing results txt file in folder to see test input cases and results.

For this question we had to construct a directed graph and then run both DFS and BFS algorithms on it. The DFS and BFS both ran for 50 iterations and had different results. This is because DFS is implemented like a stack recursively (LIFO) and BFS is implemented with queues (FIFO). This quality causes them to have a different order when visiting vertexs.