CSC700-34: Project 7A Kruskal’s MST (C++)

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Program implemented as the algorithm steps below (provided by Prof. Phillips)

Algorithm Steps:

0. numNodes 🡨 get from input file

Allocate and initialize all the members in KruskalMST class,

printSet(inWhichSet) // print the inWhichSet array to argv[3] with proper heading

// Step 1 to Step 3 is to make a list of input edges in ascending order so that for the subsequence of

// finding a min cost edge would be easy.

1. <Ni, Nj, edgeCost> 🡨 read from input file

newEdge 🡨 create an undirectedEdge and fill with <Ni, Nj, cost>

insertEdge ( newEdge, edgeListHead) // Using insertion sort to insert newEdge into the linked list of

edgeListHead ( in ascending order by the cost)

2. printList (edgeListHead) //print up to the first 10 edges on the edgeList) to argv[3] file (with proper

heading)

3. Repeat step 1 to step 2 until the input file is empty

4. nextEdge 🡨 removedEdge (edgeListHead)

//nextEdge is <Ni, Nj, cost>

// if Ni and Nj are in the same set // check inWhichSet(Ni) with inWhichSet(Nj) to see if there are equal

then discards nextEdge

5. repeat step 4 until Ni and Nj are in different sets.

6. pushEdge(nextEdge, MSTofG) // push nextEdge in the front of MSTofG

totalMSTCost += the cost of nextEdge

merge2Sets (Ni, Nj) // now, Ni, Nj are in the same set

numSets --

printSet(inWhichSet) // print the inWhichSet array to argv[3] (with proper heading)

7. printList(MSTofG) // print up to the first 10 edges of MSTofG) to argv[3] file (with proper heading)

8. repeat step 4 – step 7 until numSets is equal to 1.