6_weightedGraph1

Wednesday, December 13, 2023 12:16 AM

6. Weighted Graphs
   Sim -10
   Hand Analysis -10
   Does the hand analysis agree with program?

6. (20 points) Weighted Graph
In the vertex and edge structure defined below

Vertex	Edge	Vertex
SFO	2703	BOS
SFO	1847	ORD
ORD	868	BOS
ORD	743	JFK
JFK	189	BOS
SFO	1465	DFW
DFW	803	ORD
DFW	1124	MIA
MIA	1093	JFK
MIA	1257	BOS
SFO	338	LAX
LAX	1234	DFW
LAX	2341	MIA

Calculate by hand as well as developing a program as a check.

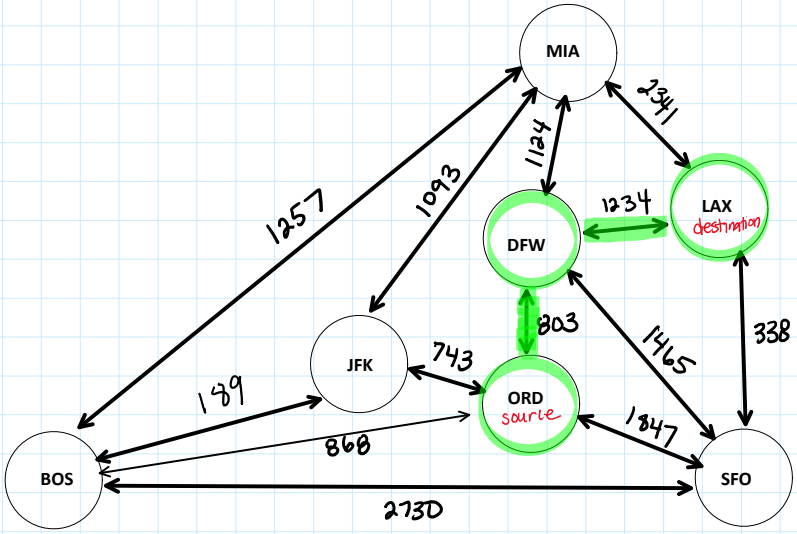
a) Find the shortest distance between ORD and LAX.

b) Find the shortest distance between JFK and SFO.

c) Find the minimum spanning tree.

From Final - Each problem requires a program and some analysis. Scan the analysis by computer project.

i	j	0 BOS	1 DFW	2 SFO	3 JFK	4 LAX	5 MIA	6 ORD
0	BOS 4	0	0	2703	189	0	1257	868
1	DFW 4	0	0	1465	0	1234	1124	803
2	SFO 4	2703	1465	0	0	338	0	1847
3	JFK 3	189	0	0	0	0	1093	743
4	LAX 3	0	1234	338	0	0	2341	0
5	MIA 4	1257	1124	0	1093	2341	0	0
6	ORD 4	868	803	1847	743	0	0	0



1.) Shortest path
ORD → LAX

(a) ORD → JFK → MIA → LAX
743 + 1093 + 2341 =

(b) ORD → JFK → BOS → SFO + LAX
743 + 189 + 2730 338 =

(c) ORD → SFO → LAX
1847 + 338 = 2185

(d) ORD → DFW → LAX
803 + 1234 = 2037

(e) ORD → JFK → BOS → MIA → LAX
743 + 189 + 1257 + 2341

(3) Find minimum spanning tree.

Kru PRIMS