Comp 282 Final Exam

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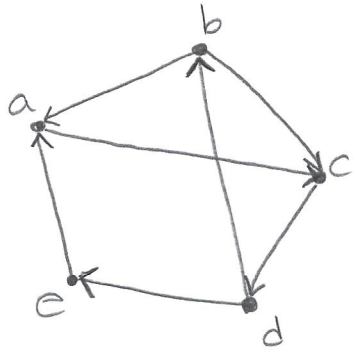
Comp 282
8/18/20

1.

a)



b) Trees do not have loops.

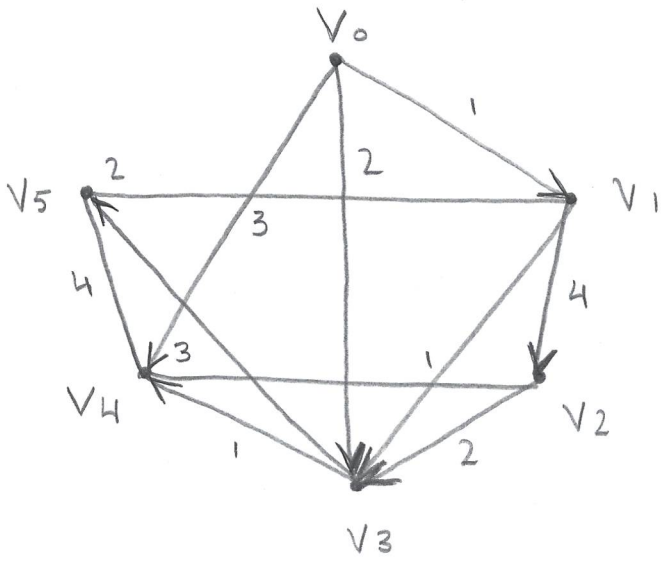
c) Hashing is good when aiming for constant time find, insert and delete on average under reasonable assumptions.

d)

Col 1	Col 3	Col 5
B	D	X y
C	E	y Z

2.

a)

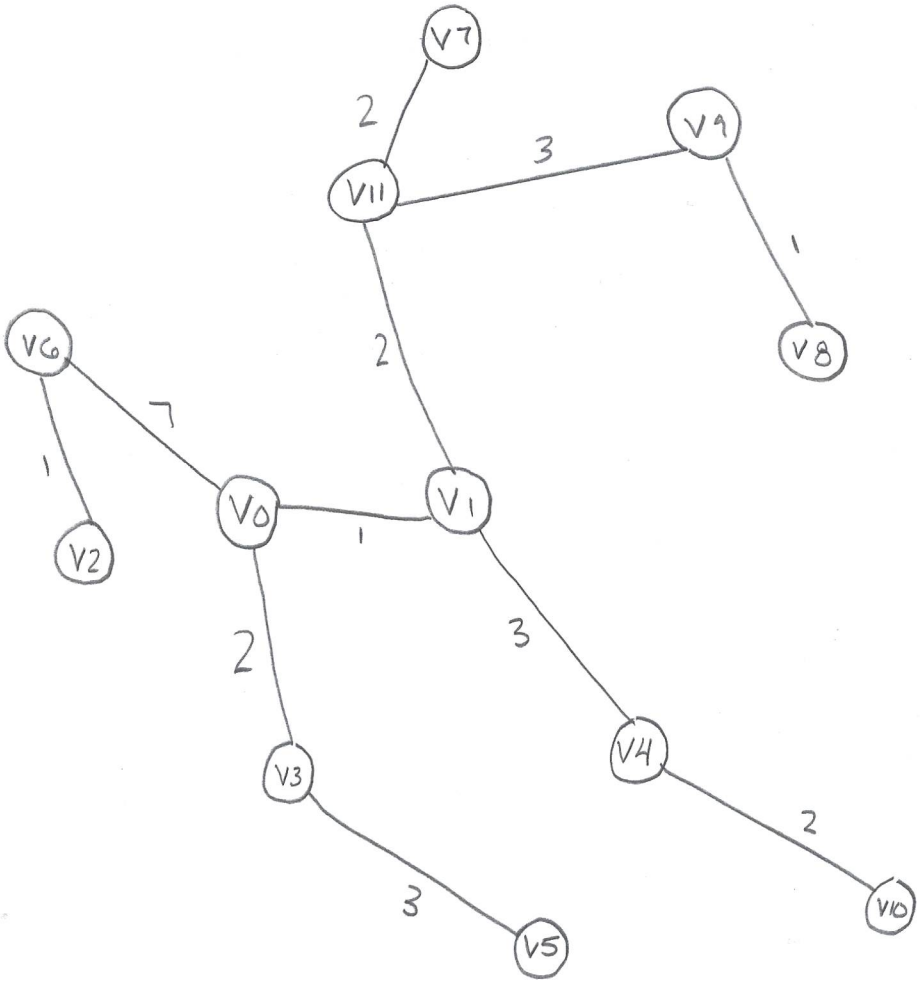


b) V_0 V_1 V_2 V_3 V_4 V_5

3. • Sort all the edges in ascending order by weight.

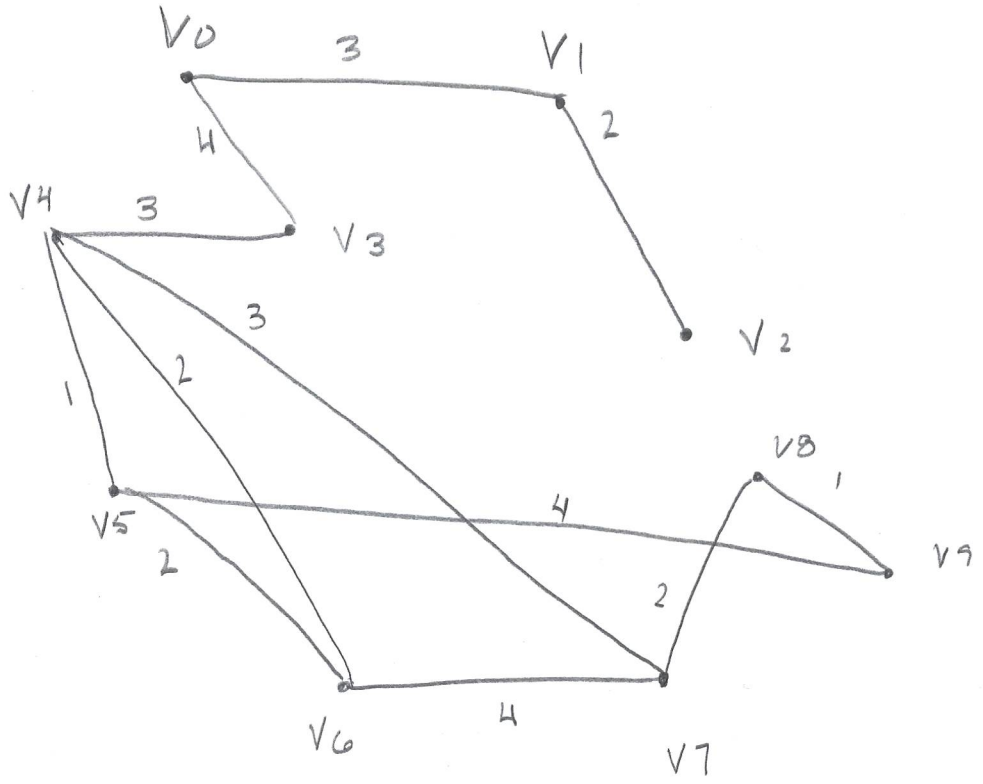
• Count all the vertices — 11

• grow the tree adding edges until number of edges is 11. If it makes a cycle, ignore that edge.



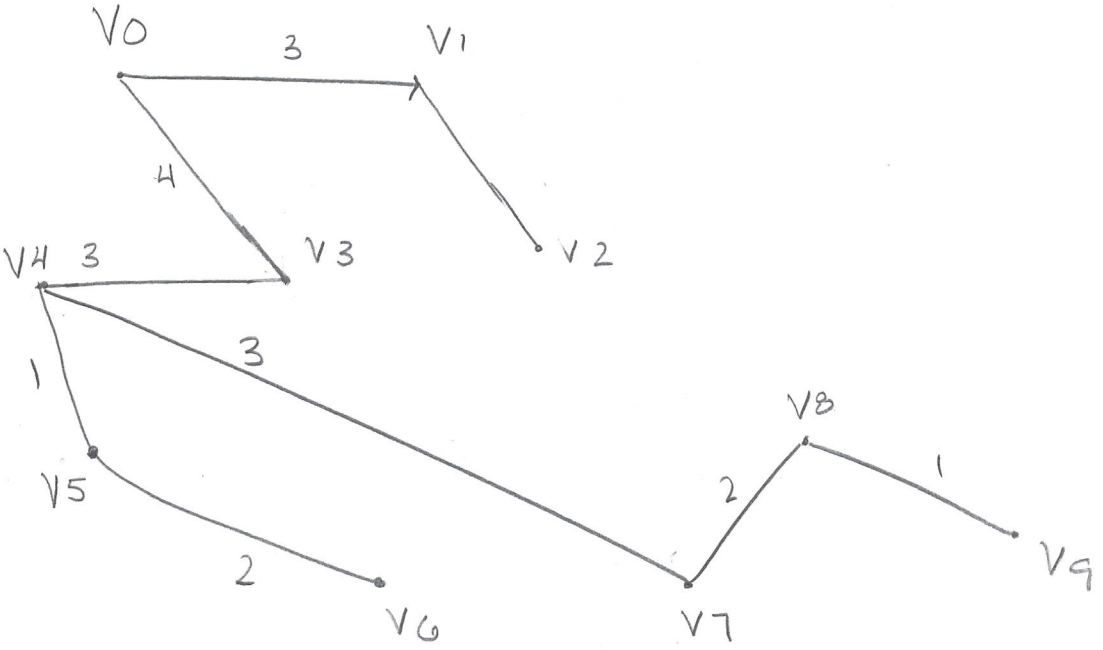
Final Cost: 27

4.



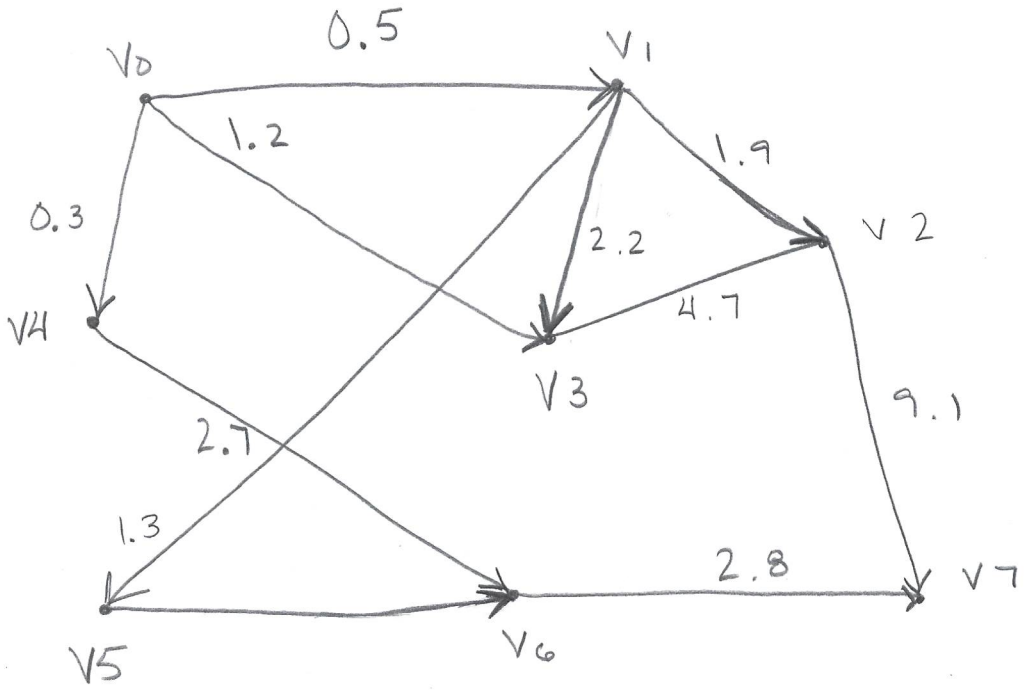
MST

V0 is the source



Final cost: 21

5.



V0	V1	V2	V3	V4	V5	V6	V7
0	0.5	2.4	1.2	0.3	1.8	3.0	5.8

Shortest paths from V0 to all other vertices.

V0 → V1
V0 → V2
V0 → V3
V0 → V3
V0 → V4
V0 → V5
V0 → V6
V0 → V7

V0 → V1 0.5 = 0.5
V0 → V2 0.5 + 1.9 = 2.4
V0 → V3 1.2
V0 → V4 0.3
V0 → V1 → V5 0.5 + 1.3 = 1.8
V0 → V4 → V6 0.3 + 2.7 = 3.0
V0 → V4 → V6 → V7 0.3 + 2.7 + 2.8 = 5.8