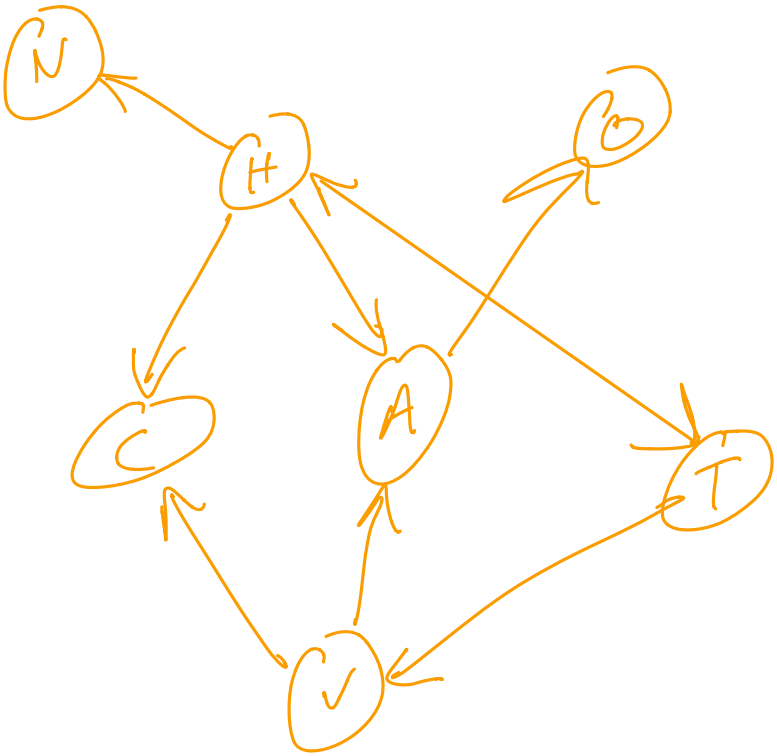
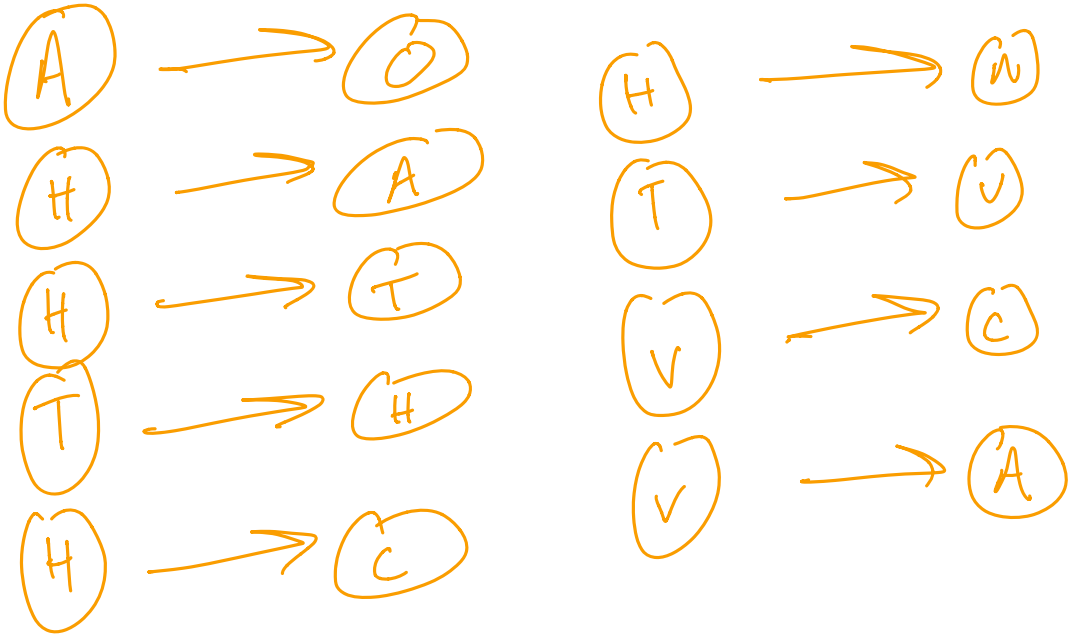
CMSC204
Kartchner

V(StateGraph) = {Oregon, Alaska, Texas, Hawaii, Vermont, NewYork, California}
E(StateGraph) = {(Alaska, Oregon), (Hawaii, Alaska), (Hawaii, Texas), (Texas, Hawaii), (Hawaii, California), (Hawaii, New York), (Texas, Vermont), (Vermont, California), (Vermont, Alaska)}

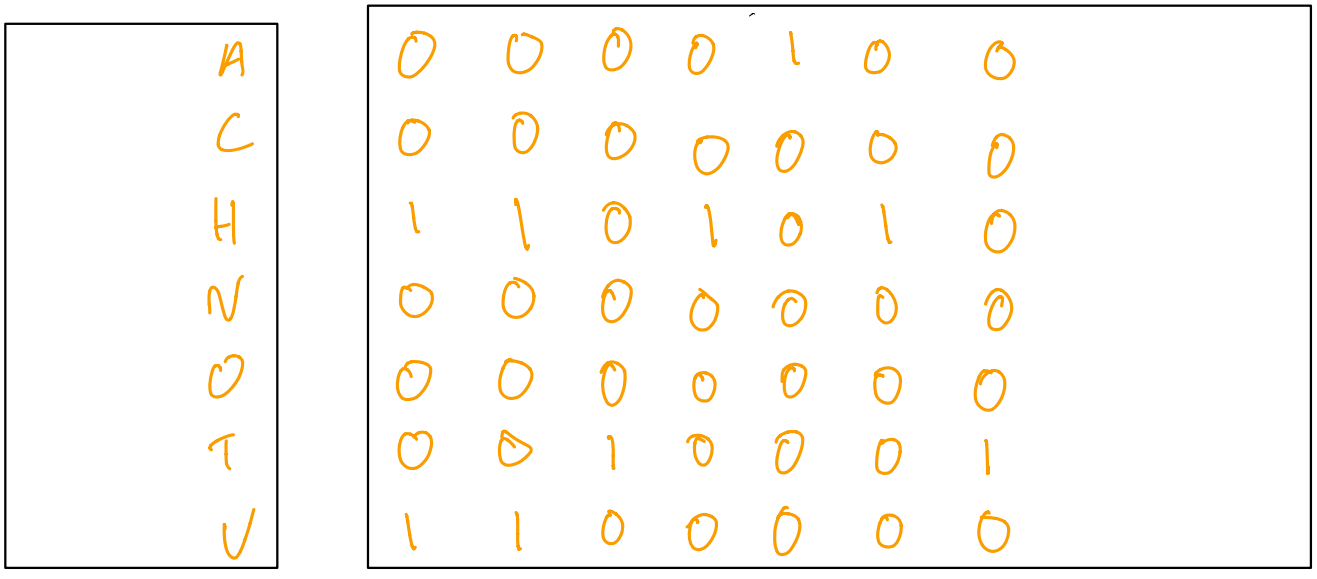
1. Draw the StateGraph



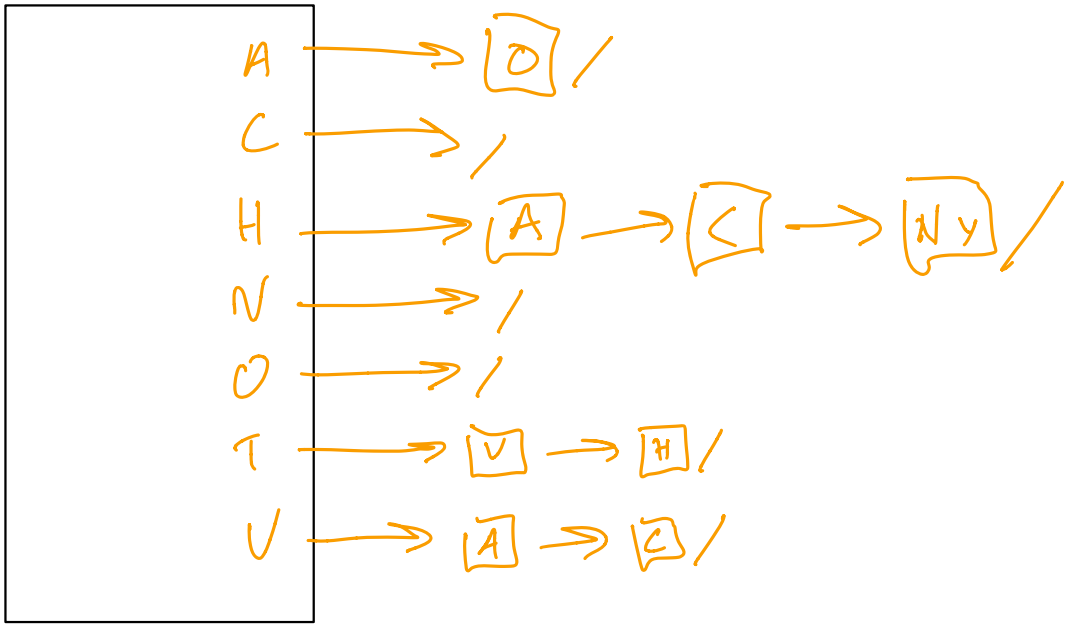


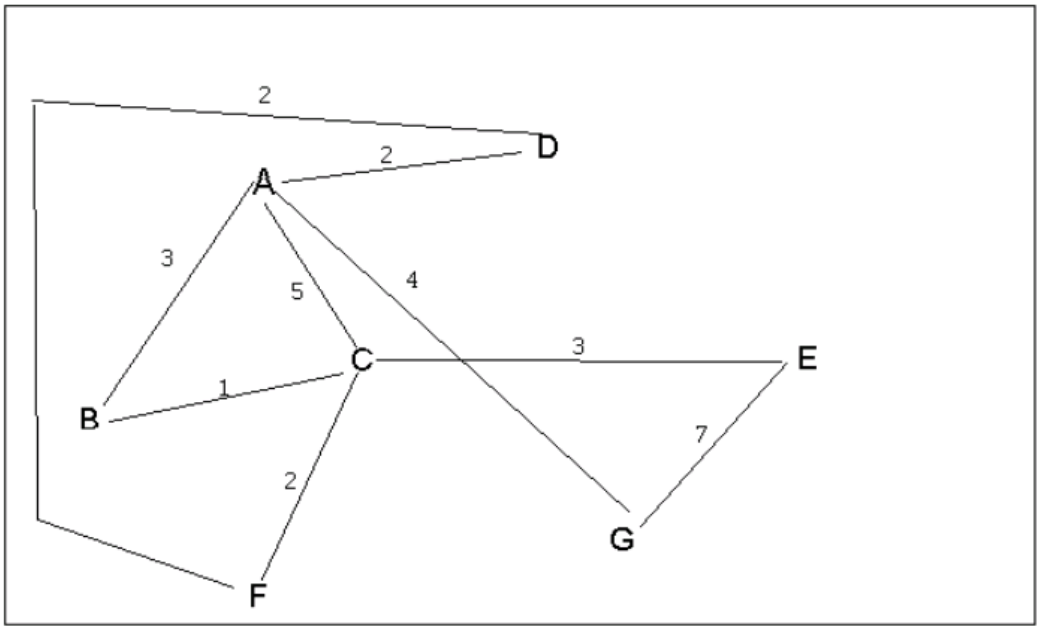
3. a. Show the adjacency matrix that would describe the edges in the graph.
Store the vertices in alphabetical order

States



3. b. Show the adjacency lists
that would describe the edges in the graph



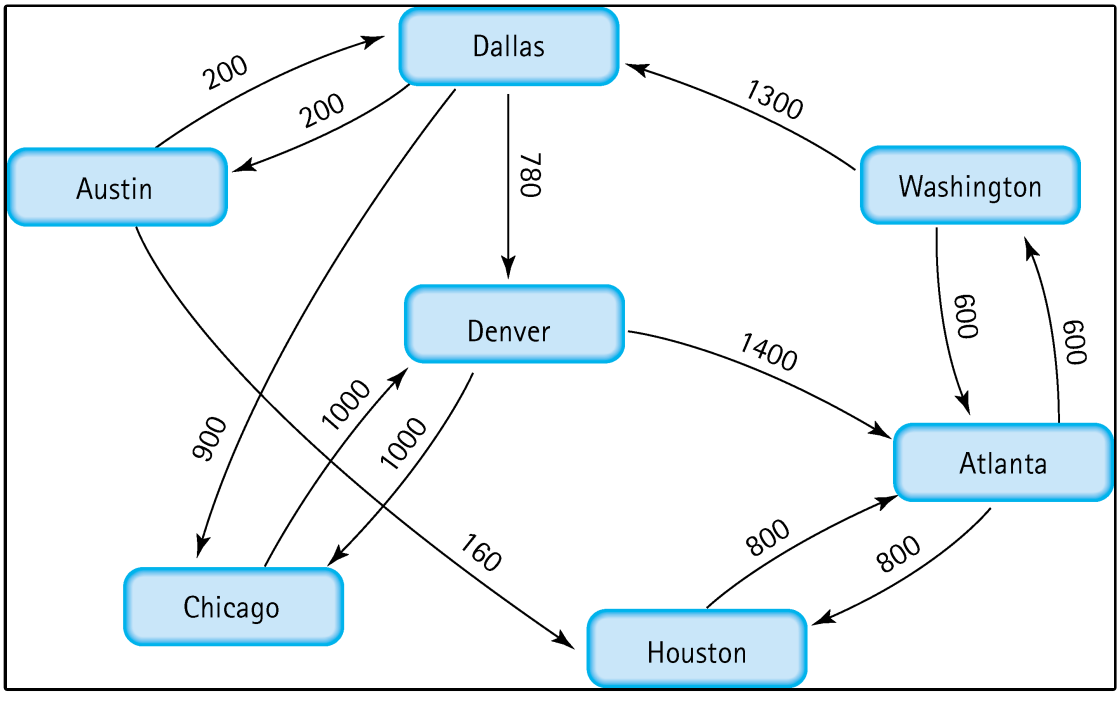


4 a. Which of the following lists the graph nodes in depth first order beginning with E?

A) E, G, F, C, D, B, A
B) G, A, E, C, B, F, D
C) E, G, A, D, F, C, B
D) E, C, F, B, A, D, G

4 b. Which of the following lists the graph nodes in breadth first order beginning at F?

A) F, C, D, A, B, E, G
B) F, D, C, A, B, C, G
C) F, C, D, B, G, A, E
D) a, b, and c are all breadth first traversals



5. Find the shortest distance from Atlanta to every other city

Washington: 600

Houston: 800

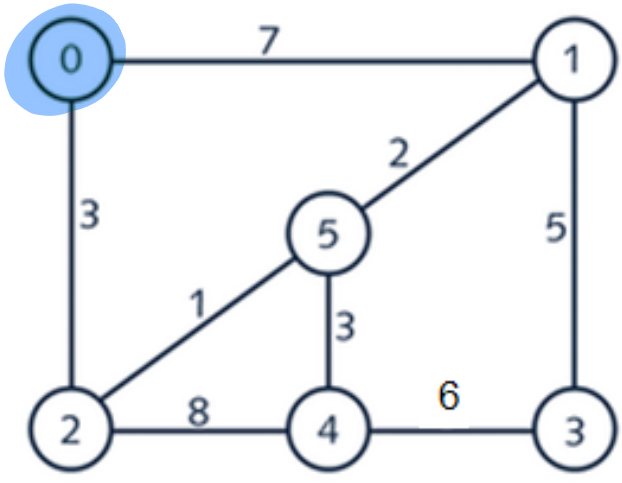
Dallas: 1900

Denver: 2680

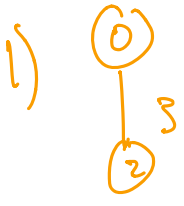
Austin: 2100

chicago: 2800

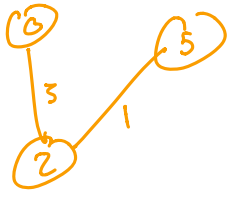
6. Find the minimal spanning tree using Prim's algorithm. Use 0 as the source vertex . Show the steps.



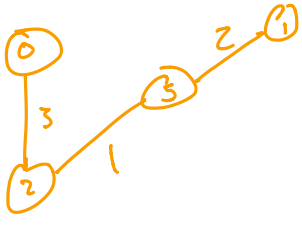
1)



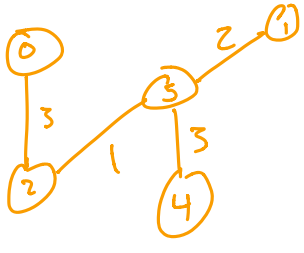
2)



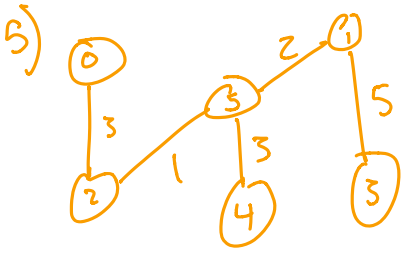
3)



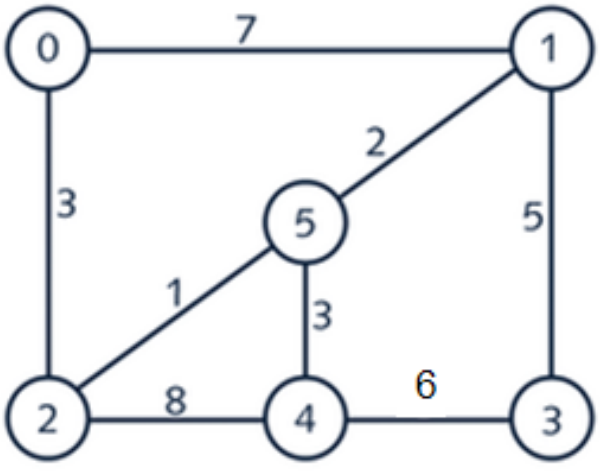
4)



5)

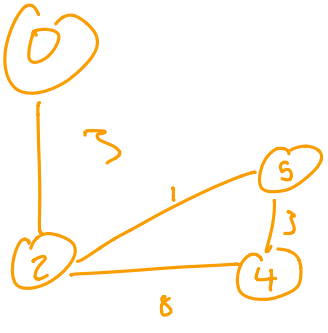


7. Find the minimal spanning tree using Kruskal's algorithm. Show the weights in order and the steps.

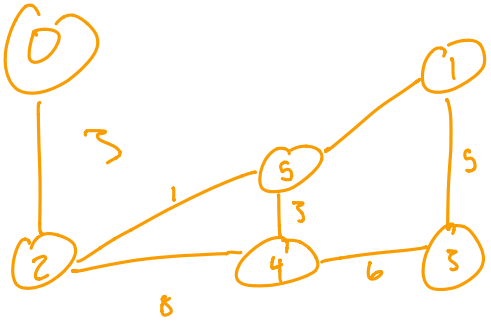


2-5 : 1
1-5 : 2
0-2 : 3
4-5 : 3
1-3 : 5

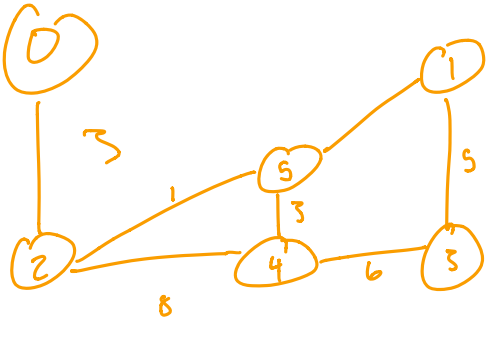
1)



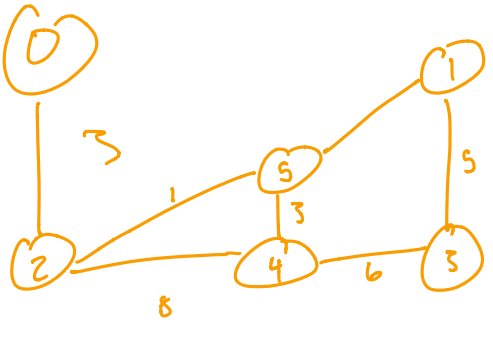
2)



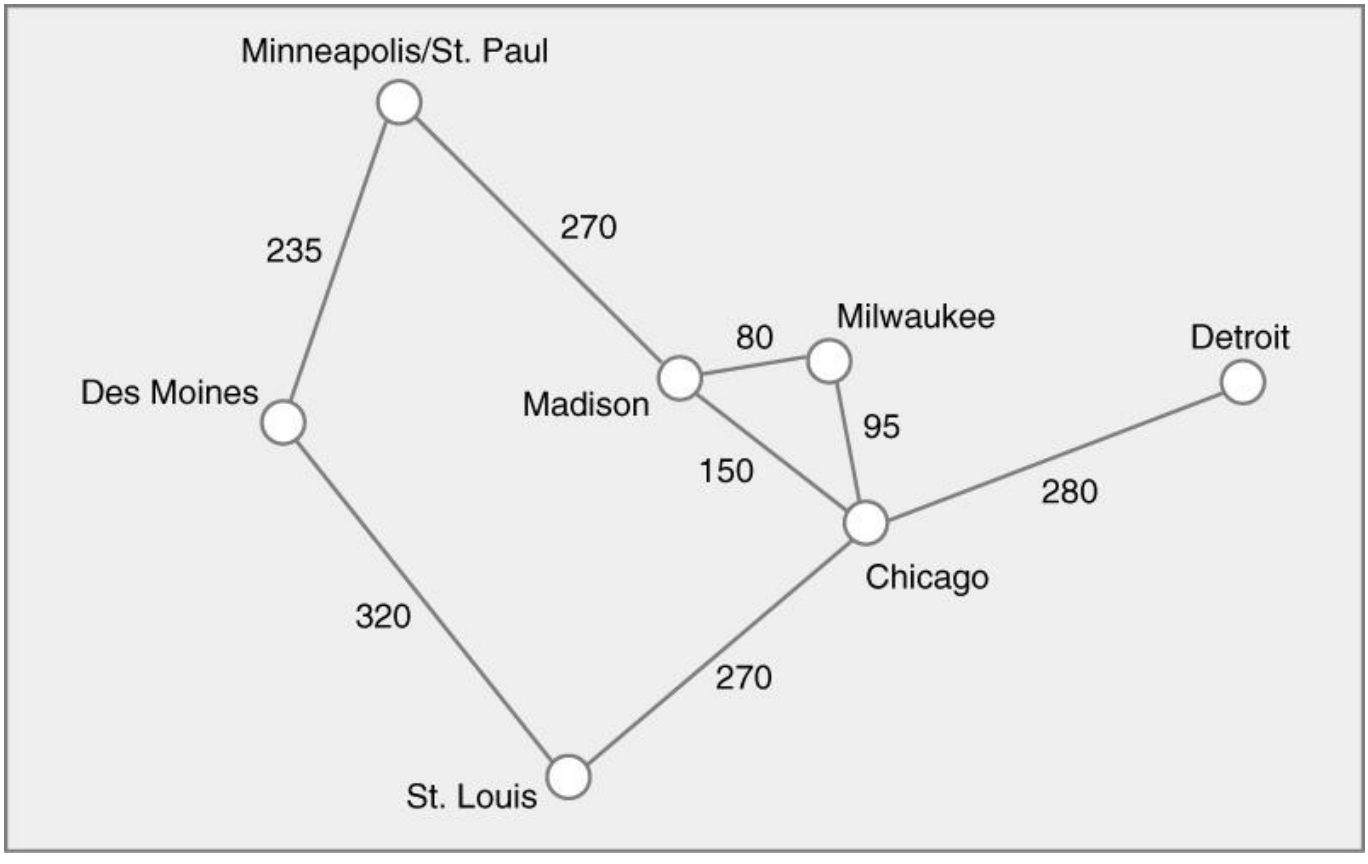
3)



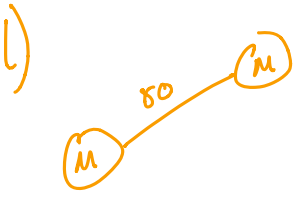
4)



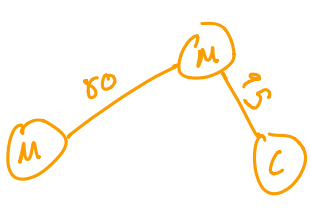
8. Find the minimal spanning tree using the algorithm you prefer. Use Minneapolis/St. Paul as the source vertex



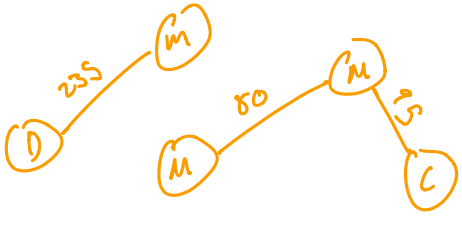
1)



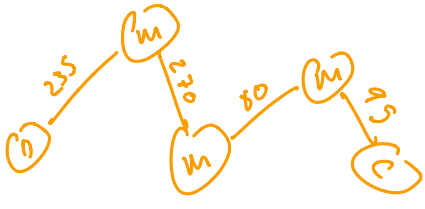
2)



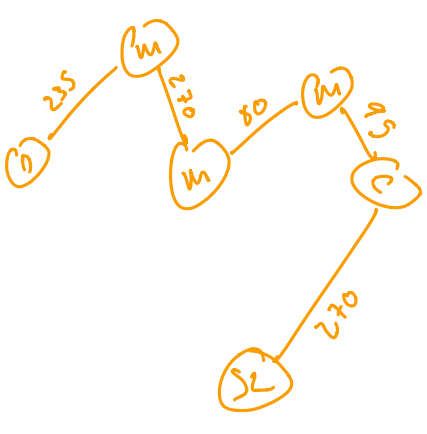
3)



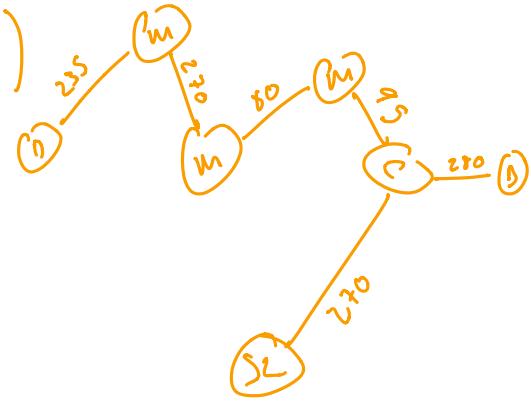
4)



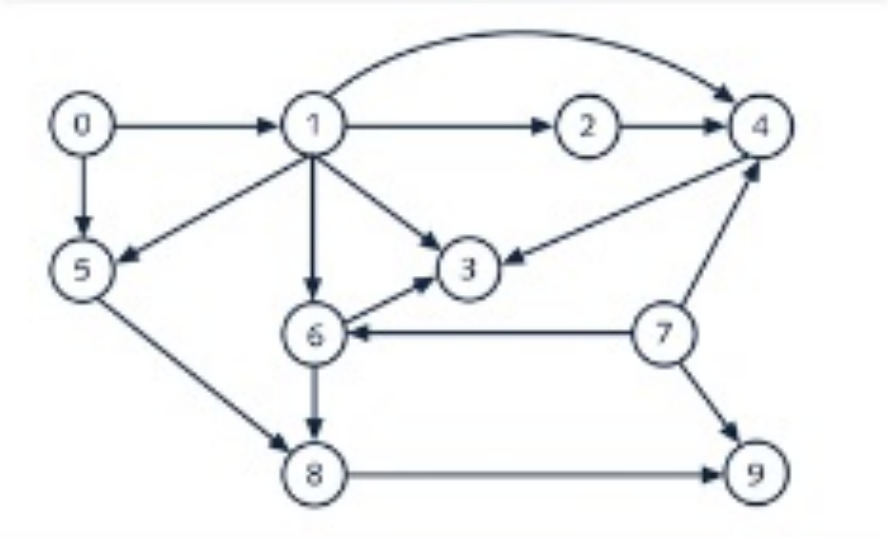
5)



6)



9. List the nodes of the graph in a breadth first topological ordering. Show the steps using arrays predCount, topologicalOrder and a queue



predCount[]

0	1	2	3	4	5	6	7	8	9
0	1	1	3	3	2	2	0	2	2

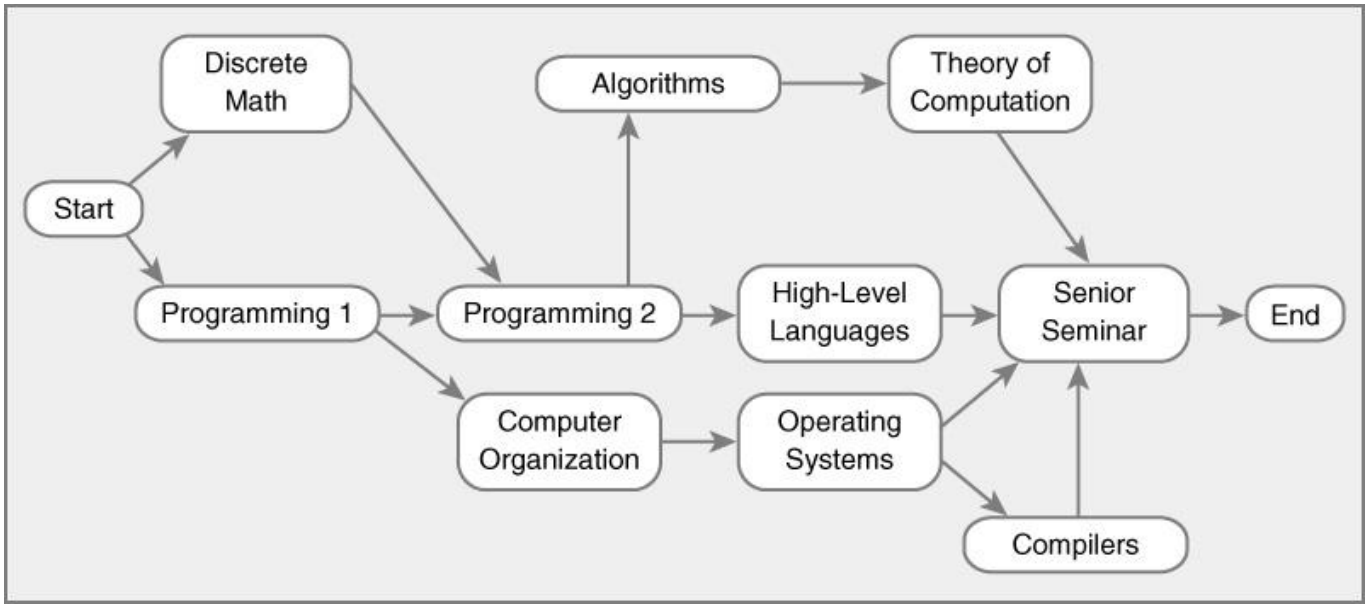
Queue

0 7
7 1
2 5
6 4
8
5
9

sort

0
0 7 1
0 7 1 2 5 6
0 7 1 2 5 6 4
0 7 1 2 5 6 4 8 3 9

10. List the nodes of the graph in a breadth first topological ordering.



0
Start

1
Discrete math

6
Theory of computation

2
Programming 1

7
Computer organization

3
Programming 2

8
Operating Systems

4
algorithms

9
Senior seminar

5
High-level languages

10
compilers

11
end