

CMSC204

Kartchner

$V(\text{StateGraph}) = \{\text{Oregon, Alaska, Texas, Hawaii, Vermont, New York, California}\}$

$E(\text{StateGraph}) = \{(\text{Alaska, Oregon}), (\text{Hawaii, Alaska}), (\text{Hawaii, Texas}), (\text{Texas, Hawaii}), (\text{Hawaii, California}), (\text{Hawaii, New York}), (\text{Texas, Vermont}), (\text{Vermont, California}), (\text{Vermont, Alaska})\}$

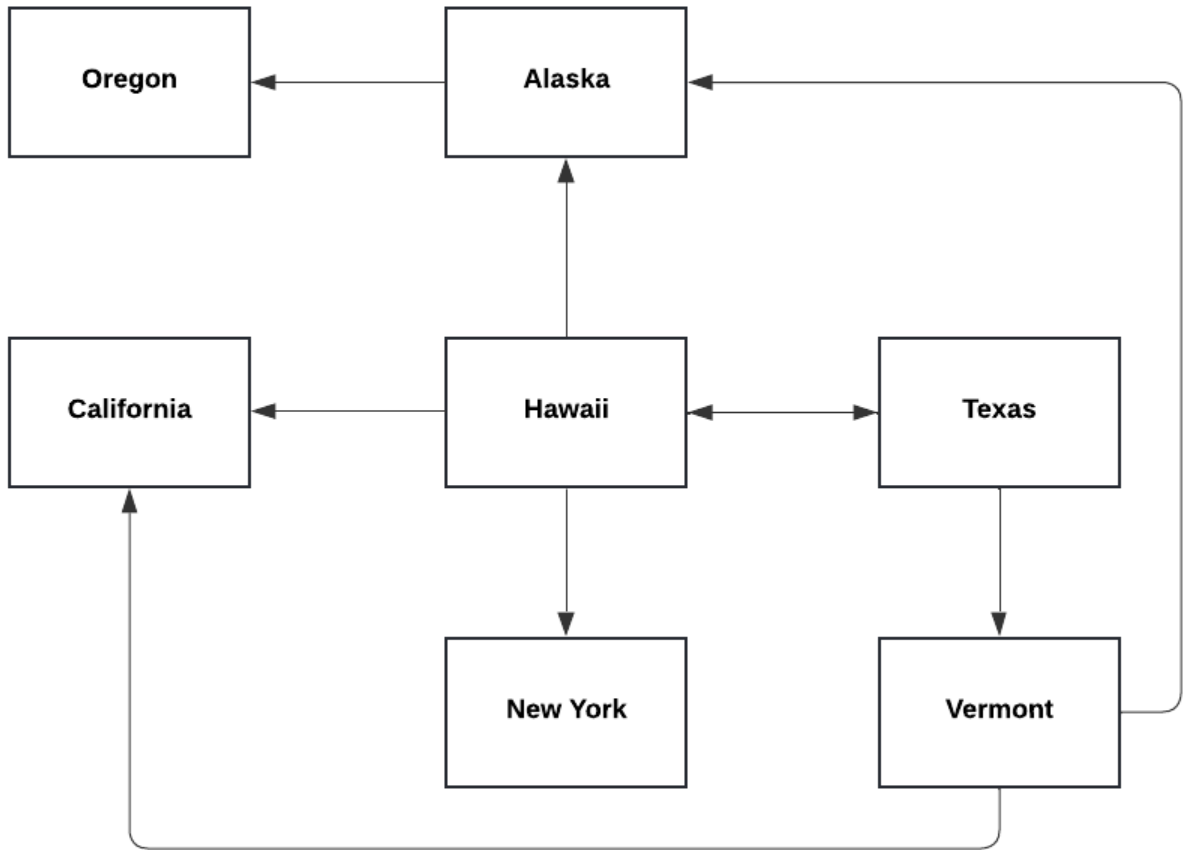
1. Draw the StateGraph

1. Describe the graph pictured above, using the formal graph notation.

$V(\text{StateGraph}) =$

$E(\text{StateGraph}) =$

2.
 - a. Is there a path from Oregon to any other state in the graph?
 - b. Is there a path from Hawaii to every other state in the graph?
 - c. From which state(s) in the graph is there a path to Hawaii?

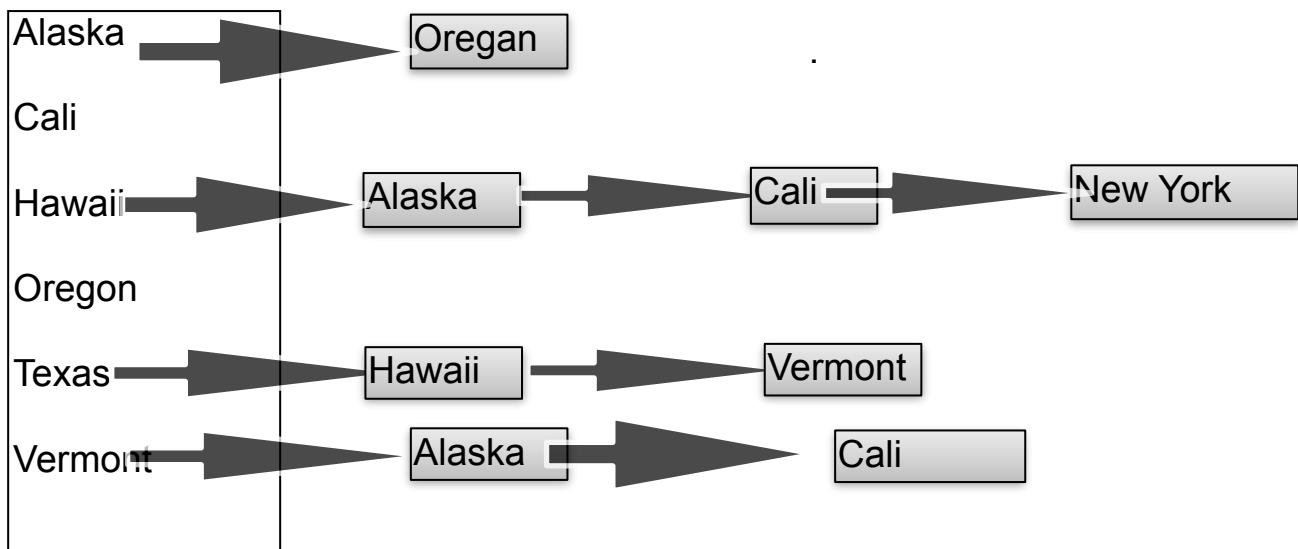


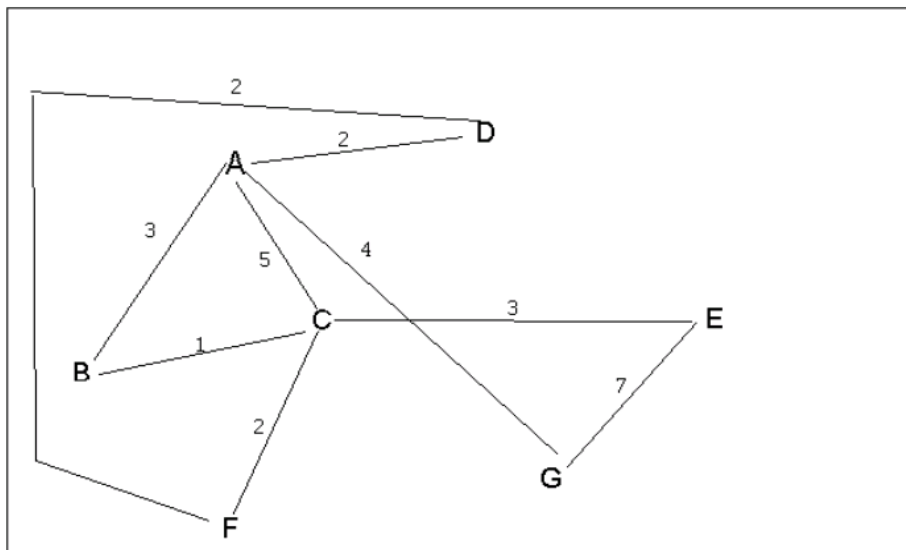
2. a. Is there a path from Oregon to any other state in the graph?
No there's not as there's only one edge and it only point to oregon.
- b. Is there a path from Hawaii to every other state in the graph?
Yes, there is.
- c. From which state(s) in the graph is there a path to Hawaii?
Only texas has a path to hawaii

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

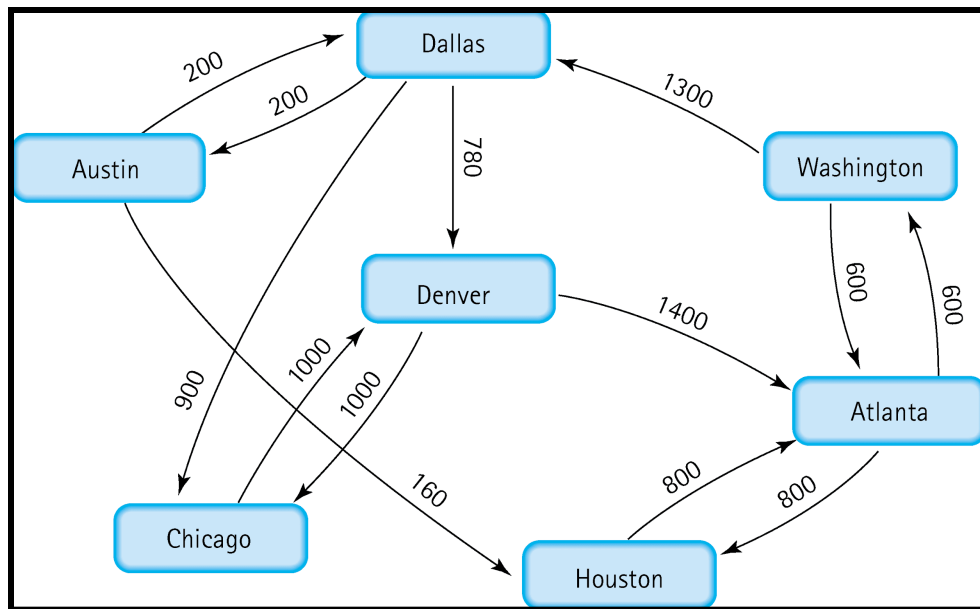
States	Alaska	California	Hawaii	New York	Oregon	Texas	Vermont
Alaska							
California							
Hawaii							
New York							
Oregon							
Texas							
Vermont							

3. b. Show the adjacency lists c E
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

ATL to Washington 600

ATL to Houston 800

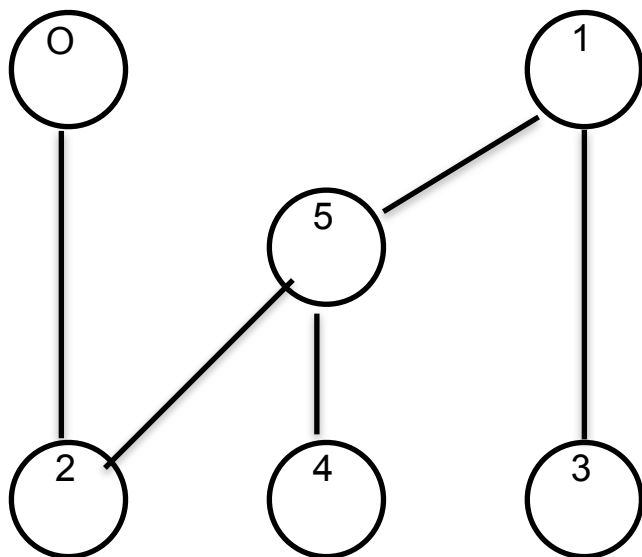
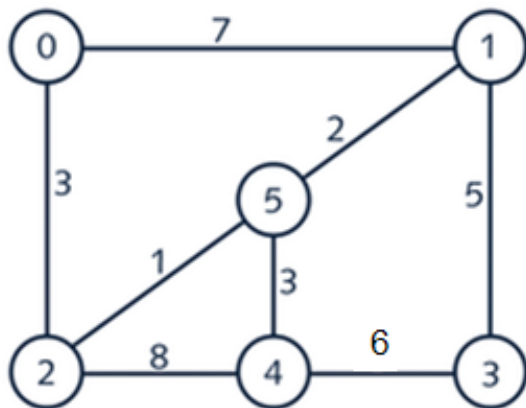
ATL to Chicago 3680

ATL to Denver 2680

ATL to Dallas 1900

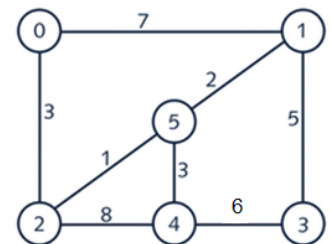
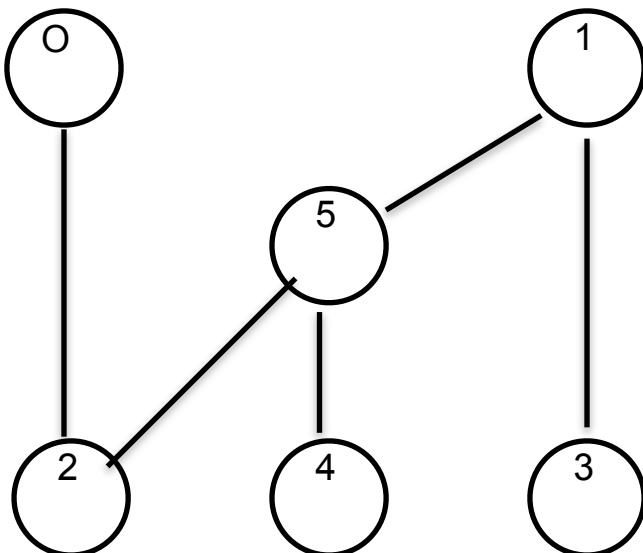
ATL to Austin 1500

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

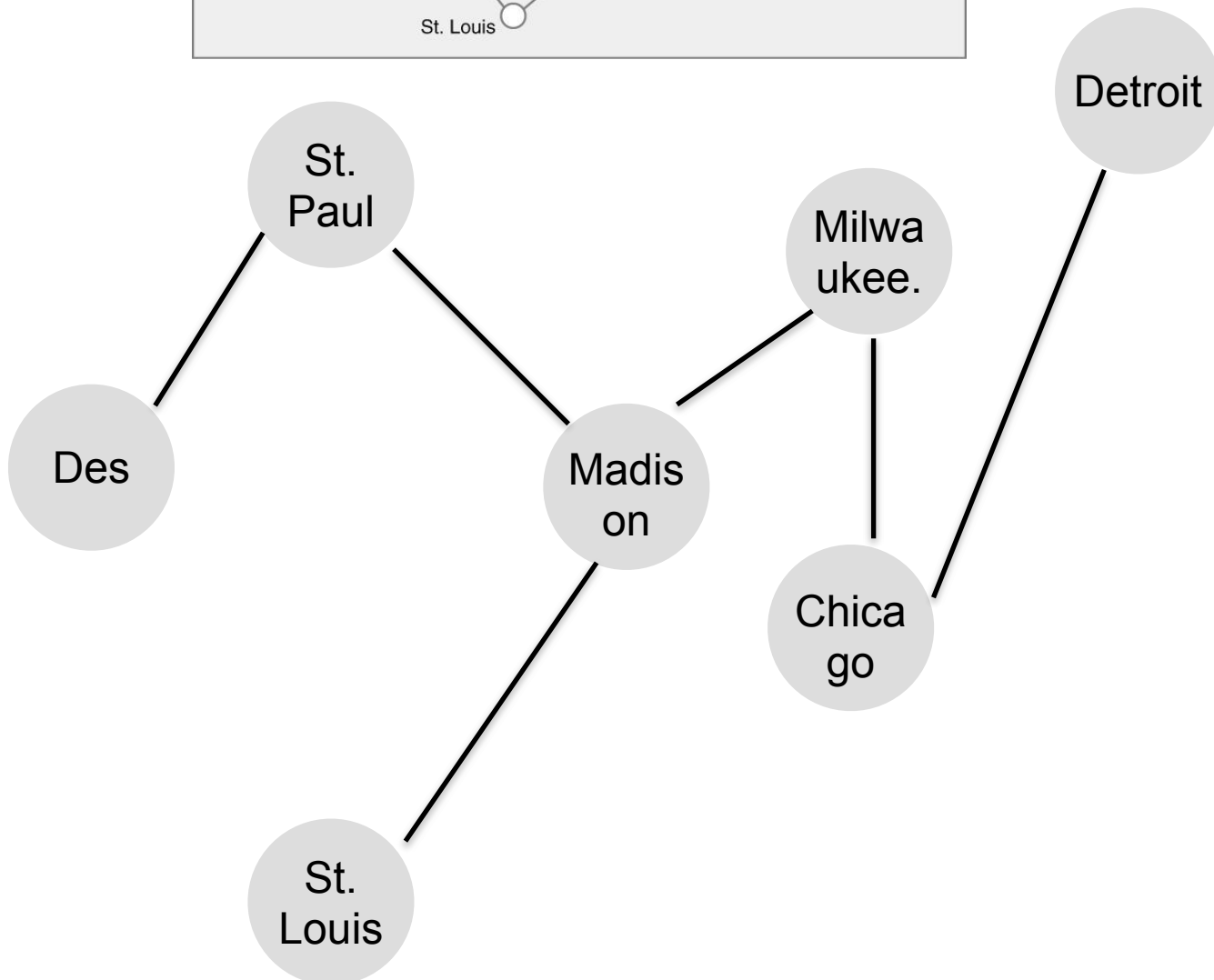
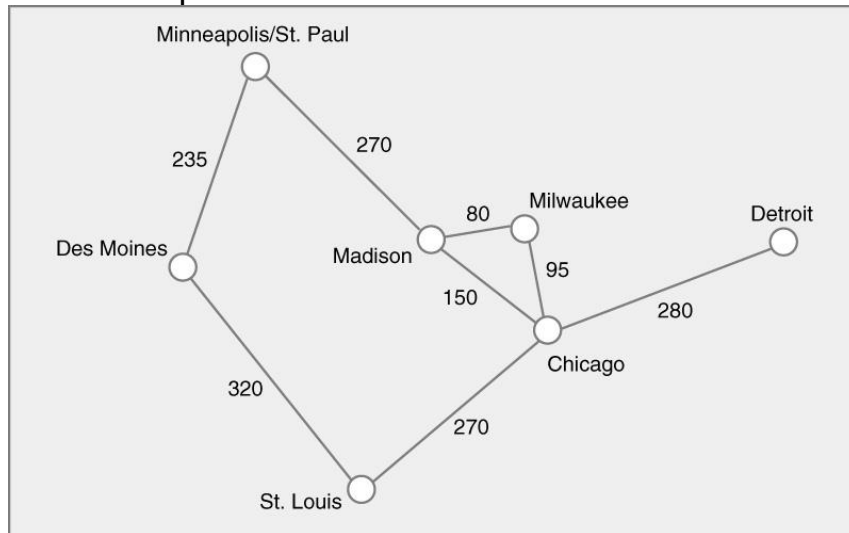


7. Find the minimal spanning tree using Kruskal's algorithm. Show the weights in order and the steps.

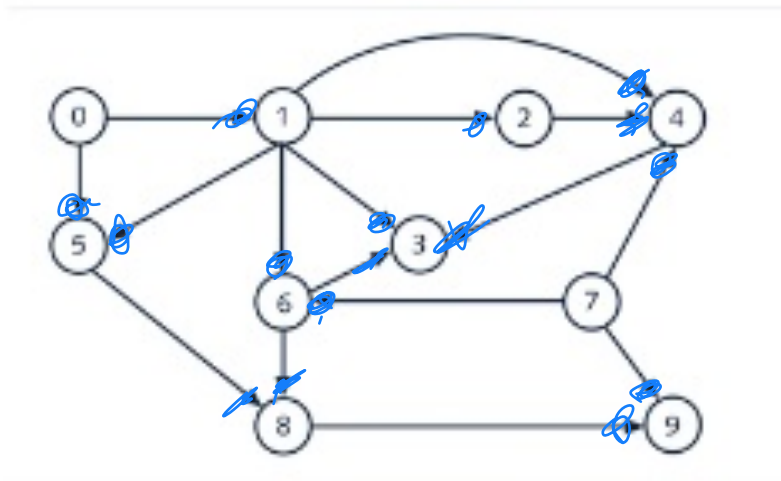
Weight	Source	destination	Include
1	2	5	X
2	5	1	X
3	0	2	X
3	5	4	X
5	1	3	X
6	4	3	
7	0	1	
8	2	4	



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



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

topological order

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

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

