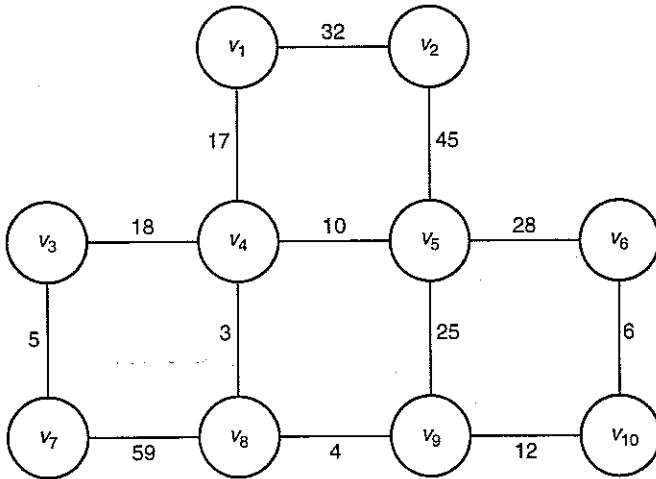


HW #4 Ch. 4

2. Use Prim's algorithm (Algorithm 4.1) to find a minimum spanning tree for the following graph. Show the actions step by step.



13. Use Dijkstra's algorithm (Algorithm 4.3) to find the shortest paths from the vertex v_4 to all the other vertices of the graph in Exercise 2. Show the actions step by step. Assume that each undirected edge represents two directed edges with the same weight.

36. Use a greedy approach to construct an optimal binary search tree by considering the most probable key, Key_k , for the root, and constructing the left and right subtrees for $Key_1, Key_2, \dots, Key_{k-1}$ and $Key_{k+1}, Key_{k+2}, \dots, Key_n$ recursively in the same way.

- (a) Assuming the keys are already sorted, what is the worst-case time complexity of this approach? Justify your answer.
 (b) Use an example to show that this greedy approach does not always find an optimal binary search tree.

No computer program needed

37. Write program - show output with data

	Cost	0	1	2	3	4
0		10	5	20	40	50
1		80	5	100	45	60
2		90	4	70	35	70
3		70	3	80	29	45
4		60	1	90	35	50

46. Write program

46. Use a greedy approach to write an algorithm for the Traveling Salesperson problem. Show that your algorithm does not always find a minimum-length tour.