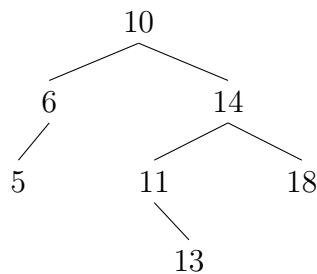


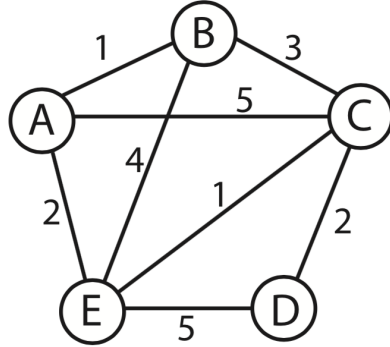
Computer Science 241

In-Class Review Exercises

- Circle T or F to indicate whether the statement is true or false.
 - T / F The partition step of QuickSort is the “divide” phase of divide-and-conquer, whereas the merge step of MergeSort is the “conquer” phase.
 - T / F Finding an element in a binary tree is worst-case $O(n)$.
 - T / F Implementing the Set ADT with a linked list would make insertion more efficient than using an array.
 - T / F A hash table with a large load factor is more time-efficient but less space-efficient than one with a small load factor.
- (1 pt) Which of the following **could** be the **result** of a call of the **partition** method in QuickSort?
 - [2, 5, 2, 4, 1]
 - [6, 2, 7, 8, 9]
 - [6, 7, 2, 3, 4]
 - [7, 9, 3, 4, 5]
- Consider the following Binary Search Tree:



- Write the sequence of necessary rotations to rebalance the tree, using “direction(value)” to denote a rotation on a node with that value. For example, left(10) indicates a left rotation on the node with value 10.
- Insert 19 into the original tree as drawn above using BST (not AVL) insert.



S	F	n	n.d
		A	
		B	
		C	
		D	
		E	

4. (3 points) Consider the graph above. In the following, break all ties alphabetically (A before B, and so on); recall that BFS and DFS do not look at edge weights.
 - (a) (1 point) List nodes in the order visited by **BFS(A)**:
 - (b) (1 point) List nodes in the order visited by **DFS(A)**

5. (2 points) Run **dijkstra(A)** on the graph, keeping a record of the order in which nodes are added into the Frontier and Settled sets. You need not keep track of backpointers.
 - (a) List nodes in the order added to the Frontier set:
 - (b) List nodes in the order added to the Settled set: