CMPT 306 Data Structure Review

1. A *stack* is a LIFO or FIFO data structure?

2. Assume a stack were initially empty and you performed the following operations:

   ```
   push(apple)
   push(banana)
   push(cherry)
   pop()
   push(donut)
   ```

   Illustrate the contents of the stack (be sure to indicate where the stack top is.)

3. A *queue* is a LIFO or FIFO data structure?

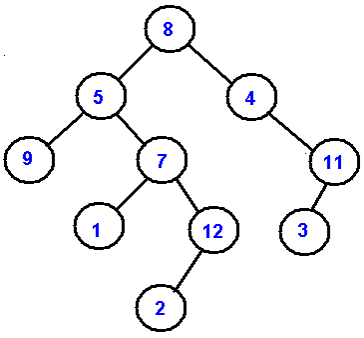
4. Assume a queue were initially empty and you performed the following operations:

   ```
   enqueue(apple)
   enqueue(banana)
   enqueue(cherry)
   enqueue(donut)
   dequeue()
   ```

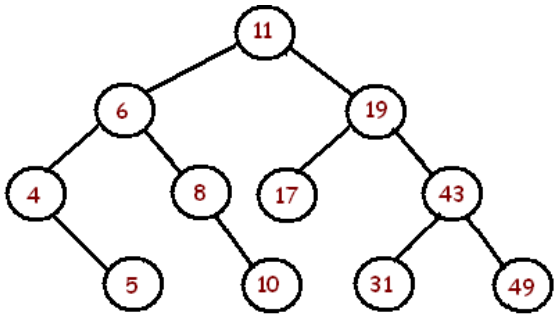
   Illustrate the contents of the queue (be sure to indicate the front and rear of the queue.)

5. Explain how a *priority queue* differs from an ordinary queue.

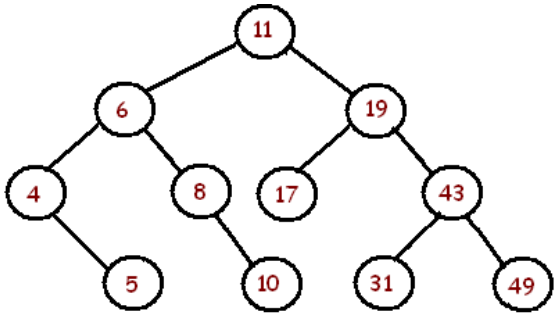
6. Is the following tree (a) a binary tree? (b) a binary search tree?



7. Is the following tree (a) a binary tree? (b) a binary search tree?



8. Consider the following tree



   Draw the tree after deleting the node with value 6. Illustrate all necessary steps to delete this node.

9. Perform a *preorder*, *in order*, and *postorder* traversal of the tree in the previous question.

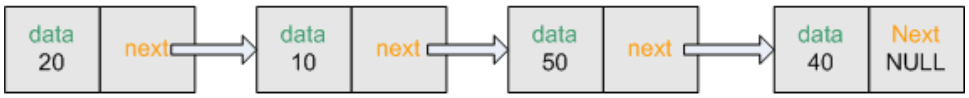
10. Consider the following dictionary/map for representing different types of teas:

Table 1: Teas

SKU	Item
174901	Oolong
202335	Chai
190284	Earl Grey
265391	Jasmine
219042	Earl Grey

What represents the *key*? What represents the *value*?

11. Consider the following linked list:



Linked list

Is this a *singly* or *doubly* linked list?

12. Assume each node in the previous figure contains the fields `data` and `next`, and `head` refers to the first node in the linked list. Sketch the pseudocode for traversing the list.