Part A - coding

1. Write a method called isMatch that takes a string of parentheses and check if all parentheses match correctly. The parameter string might consist of other characters. Ignore other characters, just check the () {} []

```
   public static boolean isMatch(String expressionLine);
```

Use a JCF ArrayDeque or LinkedList as a stack to store all open or left parentheses.
Name your file as A2Match then follow by the first two letters of your last name and first two letters of your first name. Sample John Smith: A2Matchsmjo.java
Use following main method to check your method.

```
public static void main(String[] args){
   String[] expression = new String[]{"{5*(x+2)+(y-1);}", "32*(20+(x[i]*3)-1",
"(){([][])}", "({}((0))", "{([]})", "{}())", "{"};
   for (String st: expression)
      System.out.println(st + " is " + isMatch(st));
}
```

2. Write a general Tree class method
public void levelOrder();
Which starts at the root of a tree and prints all elements of the tree in level-order (in one line).

It may call a private levelOrder method which takes a waiting queue of nodes to be printed. If so, please implement the following method as well.
private void levelOrder(List<TreeNode<E>>)

3. Write a general Tree class method
public void postOrder();
Which starts at the root of a tree and prints all elements of the tree in post-order (in one line).

It may call following private method which should also be implemented if called.
private postOrder(TreeNode<E>)

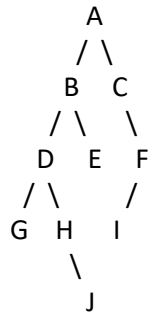
4. Write a general Tree class method
public int height(TreeNode<E>);
Which takes a node as its parameter and check the height of the given node. This method is called in the following method.

```
public int height(){
   return height(root);
}
```

Extra Credit. Write a general Tree class method
public void isSubTree(TreeNode);
Which takes a node of a subtree, and check whether the subtree starting at the parameter node is a subtree of current tree.

Part B – written (Submit as an pdf file, or hand-in in class.)

5. Consider following tree



a. What is the height of the tree?

b. What is the height of node E?

c. What is the output of pre-order traversal?

d. What is the depth of the node E?

e. Is E an internal node?

6. Consider following post-order expression, draw the expression tree.
123*+4-56-/

7. Draw the following math algorithm as expression tree.
(3-(5+1) – 2) * (2+3*6) / 3

8. Consider following function, it should remove even values in list,

```
public static void removeEven(List<Integer> list){
  for (int i : list){
    if (i % 2 == 0) list.remove(i);
  }
}
```

Does this one work? If not, write the correct version.