1. (2 pts) Suppose we want to implement a simple stack of ints using a String. Fill in the code in the push method. Assume this method is in the class definition for the stack that has a String s as an instance variable.

```java
public void push(int num) {
}
```

2. (2 pts) Suppose you have a class definition for a Stack. What will the following code produce? Explain.

```java
public class Question2 {
    public static void main(String[] args) {
        Stack stack1 = new Stack();
        Stack stack2 = new Stack();
        String word = "Hello";
        for (int i=0;i<word.length();i++)
            stack1.push(word.substring(i,i+1));
        while (!stack1.isEmpty())
            stack2.push(stack1.pop());
        System.out.println(stack2.pop());
    }
}
```

3. (2 pts) Suppose we create a Queue and enqueue 4 stacks. We call them stack1, stack2, stack3, and stack4. For stacki we push onto it the numbers starting at \(10^i\) and ending at \(11^i\). We write a program which will dequeue each stack from the queue, and immediately pop each element off the stack and print it before the next stack is dequeued. What will be the first thing printed? What will be the last thing printed?

4. (2 pts) Is the following a well-defined recursive method? Why or why not?

```java
public int factorial(int num) {
    if (num == 0)
        return 1;
    else
        return (num + factorial(num+1));
}
```

5. (2 pts) Suppose we have a linked list with the following add method. Assume that the linked list is defined in a class definition which has a self-referential inner class called Node and an instance variable call head that is of type Node.

```java
public void add(Object o) {
    head = new Node(o,head);
}
```

Which data structure could this linked list implement assuming that elements are removed from the beginning of the list?