

Study questions set #9

1. State the full terms abbreviated below:
 - a. GUI
 - b. JAR
 - c. API
2. What is the difference between the command line programs `java` and `javac`?
3. Indicate the points at which `obj1`, `obj2`, and `obj3` each become eligible for garbage collection, and state the full console output.

```
public class Garbage {  
  
    public static String garbage(String str) {  
        String newOne = new String(str); //obj2  
        str = null;  
        return newOne;  
    }  
  
    public static void main(String[] args) {  
  
        String str1 = new String("Hello"); //obj1  
        String str2 = garbage(str1);  
        str2 = str2.replace("H", "Y")+"w";  
        System.out.println(str2);  
  
        Integer itg1 = new Integer(0); //obj3  
        for(int i = 0; i < 10; i++) itg1++;  
        System.out.println(itg1);  
  
        ArrayList<Integer> ints = new ArrayList<Integer>();  
        ints.add(1);  
        ints.add(2);  
        ints.add(3);  
        for(Integer i : ints) i++;  
        System.out.println(ints);  
    }  
}
```

4. Order the following functions of x from smallest to largest, in the “Big-O” sense.

- a. $\ln(10x)$
- b. x^x
- c. 2^{100x}
- d. x^2+2x+1
- e. $-x^{10}$
- f. $x^{1/2}$
- g. $\ln(\ln(x))$

5. Rewrite the following method without a loop, using recursion:

```
public static int oddSum(int n) {  
    int sum = 0;  
    for(int i = 1; i <= n; i++) sum += 2*i-1;  
    return sum;  
}
```