CS163/164: More Loops Worksheet
Name(s):_____

1. Write a method that receives a String as a parameter and returns a new String containing each letter that appears in the String followed by how many times that letter appears in the String.

    For example: Considering that the method will receive as a parameter the String "blueberry", it will return the following String "b2l1u1e2b2e2r2r2y1".

    Tip:

    –   First think about what do you need to do in order to solve this problem (write a sequence of steps in English).

    –   When you have that clear in your mind, translate your steps to Java and write the code.

```
public class Question1 {
    public static void main(String args[]){
        String str = "blueberry";
        System.out.println(q1NestedLoop(str));
        System.out.println(q1(str));
    }
    public static String q1NestedLoop(String str){
        String msg ="";
        for(int i = 0; i < str.length(); i++){
            char c = str.charAt(i);
            int counter = 0;
            for(int j = 0; j < str.length(); j++){
                char c2 = str.charAt(j);
                if(c == c2) counter++;
            }
            msg = msg + c + counter;
        }
        return msg;
    }
    public static String q1(String str){
        String ret = "";
        for(int i = 0; i < str.length(); i++){
            char c = str.charAt(i);
            int count = occurrences(str, c);
            ret = ret + c + count;
        }
        return ret;
    }
    public static int occurrences(String str, char c){
        int count = 0;
        for(int i = 0; i < str.length(); i++){
            if(c == str.charAt(i))
                count++;
        }
        return count;
    }
}
```

2. Write a method that continues to prompt a user to enter a number in the following interval [1-12]. When the user enter a number in that interval, return that number. Which loop kind of loop are you thinking of using?

```
public static void q2(){
        Scanner scanner = new Scanner(System.in);
        int number = 0;
        do{
```

```
            System.out.println("Enter a number between 1-12 inclusive:");
            number = scanner.nextInt();
        }while(number <= 0 || number > 12);
        System.out.println(number);
    }
}
```

3. Considering the following problem:

    Write a program that reads infinite positive numbers. When zero or a negative number is read, the program stops and prints the maximum value entered.

    Which loop is the most appropriate to implement this program?

    - Using a for loop
    - Using a while loop
    - Using a do…while loop

    Explain your decision.

    The most appropriated loop is the while loop because infinite positive numbers, could range from 0 to a number that we don't know. Meaning that it could not execute the while at all. Do…while will execute at least one time and are most used for validation of data.

    Below are two possible implementations for this problem. One using while and the other one using do..while.

```
public static void q3v1(){
    Scanner scanner = new Scanner(System.in);
    int max = -1;
    System.out.println("Enter a positive number: (negative or zero to stop the
program)");
    int number = scanner.nextInt();
    while(number > 0){
        if(number > max)max = number;
        System.out.println("Enter a positive number: (negative or zero to stop the
program)");
        number = scanner.nextInt();
    }
    if(max == -1) {
        System.out.println("No positive number entered!");
    }
    else{
        System.out.println(max);
    }
}

public static void q3v2(){
    Scanner scanner = new Scanner(System.in);
    int number = 0;
    int max = -1;
    do{
        System.out.println("Enter a positive number:");
        number = scanner.nextInt();
        if(number > max) max = number;
    }while(number > 0);
    if(max == -1) {
        System.out.println("No positive number entered!");
```

```
    }
    else{
        System.out.println(max);
    }

}
```