CSI 213 - Data Structures

Lab 03 - Recursion

February 13, 2016

1. What does the following program output when run? Walk through on paper and predict what value it will print, then test it on a computer.

```
1  public class Recursion{
2    public static void printSomething(int x){
3      if(x<1){
4        System.out.println(x);
5        return;
6      }
7      System.out.println(x);
8      printSomething(x-1);
9    }
10   public static void main(String[] args){
11     printSomething(4);
12   }
13 }
```

Listing 1: Recursion example 1

2. What does the following program output when run? Walk through on paper and predict what value it will print, then add print statements to the code and test it.

```
1  public class Recursion{
2    public static int recursive(int a){
3      if(a==0)
4        return 1;
5      return 3*recursive(a-1);
6    }
7    public static void main(String[] args){
8      System.out.print(recursive(4));
9    }
10 }
```

Listing 2: Recursion example 2

3. What does the following program output when run? Walk through on paper and predict what value it will print, then add print statements to the code and test it.

```
public class Recursion{
  public static int rangeSum(int[] array, int start, int end){
    if(start > end)
      return 0;
    else
      return array[start] + rangeSum(array, start+1, end);
  }
  public static void main(String[] args){
    int[] numbers = {1, 2, 3, 4, 5, 6, 7, 8, 9};
    int sum;
    sum = rangeSum(numbers, 3, 7);
    System.out.println(sum);
  }
}
```

Listing 3: Recursion example 3