

CSSE 220 – Object-Oriented Software Development  
 Rose-Hulman Institute of Technology

Worksheet 20

Name (Print): \_\_\_\_\_ Section: \_\_\_\_\_

1. ArrayList

```
1  int newNum = list1.get(k); // where 0 <= k < list1.size()
2  //BigO: -----
```

2. ArrayList

```
1  list1.add(0, 100); // where list1.size() > 0
2  //BigO: -----
```

3. Complete Recursion problem: Given a string, compute recursively (no loops) the number of "11" substrings in the string. The "11" substrings should not overlap. Identify BigO

```
1  public static int count11(String str) {
2
3
4
5
6
7  }
8  //BigO: -----
```

4. Summary Table for MergeSort:

Case	BigO
Worst	
Best	

5. Suppose the merge sort algorithm from class is applied to the initial array.

9	5	7	10	18	1	12	8	16	4
---	---	---	----	----	---	----	---	----	---

Show the state of the two sub-arrays immediately before the final merge.

--	--	--	--	--	--	--	--	--	--

6. Provide the order of the **five** time complexity families as input size increases:

\_\_\_\_\_

7. Give the Big-O runtime for each of the code snippets below. In each case,  $n$  refers to the size of the input array or the integer  $n$  itself

```
public static long method1(int[] arr) {
    long result = 0;

    int n = arr.length;
    for(int j = 0; j < n; j++) {
        for(int k = 0; k < 10000; k++) {
            result += (j*k);
        }
    }

    for(int j = 0; j < n; j++) {
        result += (2 * j) - 3;
    }

    return result;
}
```

1) \_\_\_\_\_

```
public static void method2(int[] arr) {
    int n = arr.length;
    for(int i = 0; i < n - 1; i++) {
        for(int j = 0; j < (n - i - 1); j++) {
            if(arr[j] > arr[j+1]) {
                int temp = arr[j];
                arr[j] = arr[j+1];
                arr[j+1] = temp;
            }
        }
    }
}
```

2) \_\_\_\_\_

8. Complete JUnit test

```
1 @Test
2 public void testInsertion() {
3     int[] arr = {3, 1, 5, 0};
4     Sort.insertion(arr);
5
6     -----;
7 }
```

9. Complete JUnit test

```
1 @Test
2 public void testCount11() {
3
4     assertEquals(-----);
5 }
6 }
```