**COMP 203 Data Structures and Algorithms, Fall 2024**

**Lab Assignment 1**

**Deadline: 07.10.2024 11:00 am**

**Read the questions and rules carefully. They are clear and well defined.**

**Rules:**

1. **No Cheating:** You are not allowed to collaborate with your friends and use any kind of websites or AI. If your homework gives a sign of any of them, **directly it will be graded as zero**.
2. **Goal:** Please do your homework alone. Our main aim is to **learn**.
3. **Submission:** Submit your work in **a single java file.** **DON’T USE ZIP/RAR etc. In these cases, your points will be deducted by 30%.**
4. **Coding policy:** Explain your code in comments. **This is a must!**
5. **Latency policy:** A 30% deduction will be applied for each day of late submission.

**File to submit:** ArrayMerge.java

**QUESTIONS**

**Coding (Total: 80pt)**

1. Implement a method in java to insert a second array in the first array at the index of the given index i. It should print the new array. The function is given as follows. **(70pt)**

public void insertArray (int [] first, int [] second, int index\_i)

**Example:**

int [] first= {1,3,5,7,9,11}

int [] second={2,4,6}

**Explanation:** After calling **insertArray (first, second, 3)** it will insert the second array into first array starting from the index 3 of first. The new array becomes {1, 3, 5, 2, 4, 6, 7, 9, 11} and prints the new array. To print the array, implement a separate printArray(int[] array) method. You can create a new array to merge these arrays.

2. Write a main method to test your methods with the given example. **(10pt)**

**Time Complexity (Total: 20pt)**

3. What is the time complexity (in terms of Big-O notation) of **insertArray** function when the first array size is n and second array size is m? **(5 pt)** Explain why step-by-step. **(5 pt)**

4.What is the time complexity (in terms of Big-O notation) of **printArray** method when the given array has the size of n? **(5 pt)** Explain why step-by-step. **(5 pt)**

You should write the answers of these time complexity questions **as comment lines in your code by giving the number of the question.**