Lab Assignment 01

Inspiring Excellence

Course Code:	**CSE111**
Course Title:	**Programming Language II**
Topic:	**Loops, String, Arrays, OOP Basics**
Number of Tasks:	**10 [Classwork: 5, Homework: 5]**

CLASSWORK

Task 1

Write a Java program that takes 10 inputs from the user in a loop, and displays the sum, average, minimum and maximum of **Only the positive odd numbers** from those numbers. If no such numbers are found, then display the message "No odd positive numbers found".

Sample Input	Sample Output
1 4 2 9 2 -4 3 -1 0 1	Sum = 14 Minimum = 1 Maximum = 9 Average = 3.5
34 -11 50 24 -24 2 -4 0 8 12	No odd positive numbers found
23 2 -4 0 8 12 34 -11 53 21	Sum = 97 Minimum = 21 Maximum = 53 Average = 32.333333333333336

Task 2

Write a Java program that takes TWO string inputs (containing exactly one word in each string) from the user. Concatenate those two strings with a single space in between them. Generate a number **which is the sum of all the letters in that concatenated string** where A = 65, Z = 90, a = 97, and z = 122. Your task is to print that concatenated string and the number generated from that string.

Sample Input	Output
Hello123 Wo%%rld	Hello123 Wo%%rld 1020
Ja12-va CHOWD+ HURY	Ja12-va CHOWD+ HURY 1087

Task 3

Write a Java program that asks the user the length of an array (N) then takes N number of doubles as elements for the array as input. First, remove the consecutive duplicate elements from the original array **to form a new array**. Then print the number of elements removed from the original array.

Sample Input	Sample Output
N = 8 Please enter the elements of the array: 5.2 2.7 1.0 1.0 2.7 3.5 3.5 3.5	New Array: 5.2 2.7 1.0 2.7 3.5 Removed elements : 3

Task 4

Design the **"Student"** class so that the main method prints the following:

Tester Class	Output

`public class StudentTester{`
`  public static void main(String [] args){`
`  Student s1 = new Student();`
`  System.out.println("Name of the Student: "+s1.name);`
`  System.out.println("ID of the Student: "+s1.id);`
`  s1.name = "Bob";`
`  s1.id = 123;`
`  System.out.println("Name of the Student: "+s1.name);`
`  System.out.println("ID of the Student: "+s1.id);`
`  }`
`}`
	`Name of the Student: Default`
	`ID of the Student: 0`
	`Name of the Student: Bob`
	`ID of the Student: 123`

Task 5

Consider the following class:

```
public class Human{
    public int age;
    public double height;
}
```

Show the output of the following sequence of statements:

	Output
`Human h1 = new Human();`	
`Human h2 = new Human();`	
`h1.age = 21;`	
`h1.height = 5.5;`	
`System.out.println(h1.age);`	
`System.out.println(h1.height);`	
`h2.height = h1.height - 3;`	
`System.out.println(h2.height);`	
`h2.age = h1.age++;`	
`System.out.println(h1.age);`	
`h2 = h1;`	
`System.out.println(h2.age);`	
`System.out.println(h2.height);`	
`h2.age++;`	
`h2.height++;`	
`System.out.println(h1.age);`	
`System.out.println(h1.height);`	
`h1.age = ++h2.age;`	
`System.out.println(h2.age);`	
`System.out.println(h2.height);`	

For this course, we'll be using **DrJava** as IDE for Java Coding:

Link to JDK and DrJava

Drjava Installation Guide:

https://www.youtube.com/watch?v=Gss9sL3Q-8s

HOMEWORK

Task 1

Write a java program that takes 2 integer numbers as input and calculates how many prime numbers exist between them.

Sample Input	Sample Output
10 15	There are 2 prime numbers between 10 and 15.
150 100	There are 10 prime numbers between 100 and 150.

Task 2

Write a Java program that takes a string input in small letters from the user and prints the previous alphabet in sequence for each alphabet found in the input.

Sample Input	Output
wxyz	vwxy
thecow	sgdbnv
abcd	zabc

Task 3

Write a Java program that will take an integer number N from the user and create an integer array by taking N numbers from the user. Print how many times each number appears in the array.

Sample Input	Sample Output
N = 5 6	6 - 2 times 15 - 2 times

15 14 15 6	14 - 1 times
N = 6 -5 10 14 10 -7 10	-5 - 1 times 10 - 3 times 14 - 1 times -7 - 1 times

Task 4

Design the **CSECourse** class to generate the correct output from the driver code provided below:

Driver Code	Output

`public class CourseTester{`
`  public static void main(String args []){`
`  CSECourse c1 = new CSECourse();`
`  System.out.println("Course Name: "+c1.courseName);`
`  System.out.println("Course Code: "+c1.courseCode);`
`  System.out.println("Credit: "+c1.credit);`
`  }`
`}`
	`Course Name: Programming Language II`
	`Course Code: CSE111`
	`Credit: 3`

Task 5

Consider the following class:

```
public class Student{
    public String name;
    public double cgpa;
}
```

Show the output of the following sequence of statements:

	Output
`Student s1 = new Student();`	
`Student s2 = new Student();`	
`Student s3 = null;`	
`s1.name = "Student One";`	
`s1.cgpa = 2.3;`	
`s3 = s1;`	
`s2.name = "Student Two";`	
`s2.cgpa = s3.cgpa + 1;`	
`s3.name = "New Student";`	
`System.out.println(s1.name);`	
`System.out.println(s2.name);`	
`System.out.println(s3.name);`	
`System.out.println(s1.cgpa);`	
`System.out.println(s2.cgpa);`	
`System.out.println(s3.cgpa);`	
`s3 = s2;`	
`s1.name = "old student";`	
`s2.name = "older student";`	
`s3.name = "oldest student";`	
`s2.cgpa = s1.cgpa - s3.cgpa + 4.5;`	
`System.out.println(s1.name);`	
`System.out.println(s2.name);`	
`System.out.println(s3.name);`	
`System.out.println(s1.cgpa);`	
`System.out.println(s2.cgpa);`	
`System.out.println(s3.cgpa);`	

Ungraded Tasks (Optional)

(You don't have to submit the ungraded tasks)

Task 1

Write a Java program that will take an integer number N from the user and create an integer array by taking N numbers from the user. Then take another number from the user and create a new array by removing that number from the input array. Finally, print the new array.

Sample Input	Sample Output
N = 5 23 100 0 56 -34 Remove Element = 100	Input array: 23 100 0 56 -34 New array: 23 0 56 -34
N = 4 -5 10 2 -7 Remove Element = 43	Input array: -5 10 2 -7 Element not found

Task 2

Write a program that reads 5 numbers into an array and prints the smallest and largest number and their location in the array.

Sample Input	Sample Output
7 13 2 10 6	The largest number 13 was found at location 1. The smallest number 2 was found at location 2.

2 4 -5 12 3	The largest number 12 was found at location 3. The smallest number -5 was found at location 2.

Task 3

Write a program that asks the user how many numbers to take. Then, it takes that many numbers in an array and prints the median value.
[How to Find the Median Value: http://www.mathsisfun.com/median.html]

Sample Input	Sample Output
5 10 50 40 20 30	The median is 30. **Explanation:** 30 falls in middle 10, 20, 30, 40, 50
4 30 10 40 20	The median is 25. **Explanation:** (20+30)/2=25 (average of two middle values from 10, 20, 30, 40.

Task 4

Write a Java program that asks the user for the length of an array and then creates an integer array of that length by taking inputs from the user. Then, reverse the **original array without** creating any new array and print it. **[In-place reverse]**

Sample Input	Sample Output
Enter the length of the array: 5 7 -31	100 97 344 -31 7

344 97 100	

Task 5

Design the **Player** class with the necessary properties so that the given Driver code produces the expected output.

Driver Code	Output

public class PlayerTester{
  public static void main(String args[]){
  Player player1 = new Player();
  player1.name = "Ronaldo";
  player1.jersy_number = 9;
  player1.position = "Striker";
  System.out.println("Name of the Player: "+ player1.name);
  System.out.println("Jersey Number of player: "+ player1.jersy_number);
  System.out.println("Position of player: "+ player1.position);
  System.out.println("==========");
  Player player2 = new Player();
  player2.name = "Neuer";
  player2.jersy_number = 1;
  player2.position = "Goal Keeper";
  System.out.println("Name of the player: "+ player2.name);
  System.out.println("Jersey Number of player: "+ player2.jersy_number);
  System.out.println("Position of player: "+ player2.position);
  }
}
	Name of the Player: Ronaldo
	Jersey Number of player: 9
	Position of player: Striker
	==========
	Name of the player: Neuer
	Jersey Number of player: 1
	Position of player: Goal Keeper