

## Assignment 3

**1. The process of finding the largest value (i.e., the maximum of a group of values) is used frequently in computer applications. For example, a program that determines the winner of a sales contest would input the number of units sold by each salesperson. The salesperson who sells the most units wins the contest. Build a java application that inputs a series of 10 integers and determines and prints the largest integer. Your program should use at least the following three variables:**

**a. counter:** A counter to count to 10 (i.e. to keep track of how many numbers have been input and to determine when all 10 numbers have been processed.

**b. number:** The inter most recently input by the user.

**c. largest:** The largest number found so far.

**Note:** Every time the sales figure of one employee is entered, the application should ask the user if they want to enter any more sales figures of a salesperson!

```
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        System.out.println("Name : Gokul Sarkar \nRoll : 46");
        Scanner sc = new Scanner(System.in);
        int counter = 0;
        int number;
        int largest = Integer.MIN_VALUE;
        String answer;
        while (counter < 10) {
            System.out.print("Enter the sales figure: ");
            number = sc.nextInt();
            if (number > largest) {
                largest = number;
            }
            System.out.print("Do you want to enter another number? (yes/no): ");
            answer = sc.next();
            if (answer.equals("no")) {
```

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```
        break;
    }
    counter++;
}
System.out.println("The largest 'sales figure number' is: " + largest);
}
}
```

### **Output:**

```
PS C:\Users\GOKUL SARKAR\Desktop\Java> javac Main.java
PS C:\Users\GOKUL SARKAR\Desktop\Java> java Main
Name : Gokul Sarkar
Roll : 46
Enter the sales figure: 150
Do you want to enter another number? (yes/no): yes
Enter the sales figure: 200
Do you want to enter another number? (yes/no): yes
Enter the sales figure: 180
Do you want to enter another number? (yes/no): yes
Enter the sales figure: 250
Do you want to enter another number? (yes/no): yes
Enter the sales figure: 220
Do you want to enter another number? (yes/no): no
The largest 'sales figure number' is: 250
PS C:\Users\GOKUL SARKAR\Desktop\Java> █
```

**2. Write an application that prompts the user to enter the size of the side of a square, then displays a hollow square of that size made of asterisks. Your program should work for squares of all side lengths between 1 and 20.**

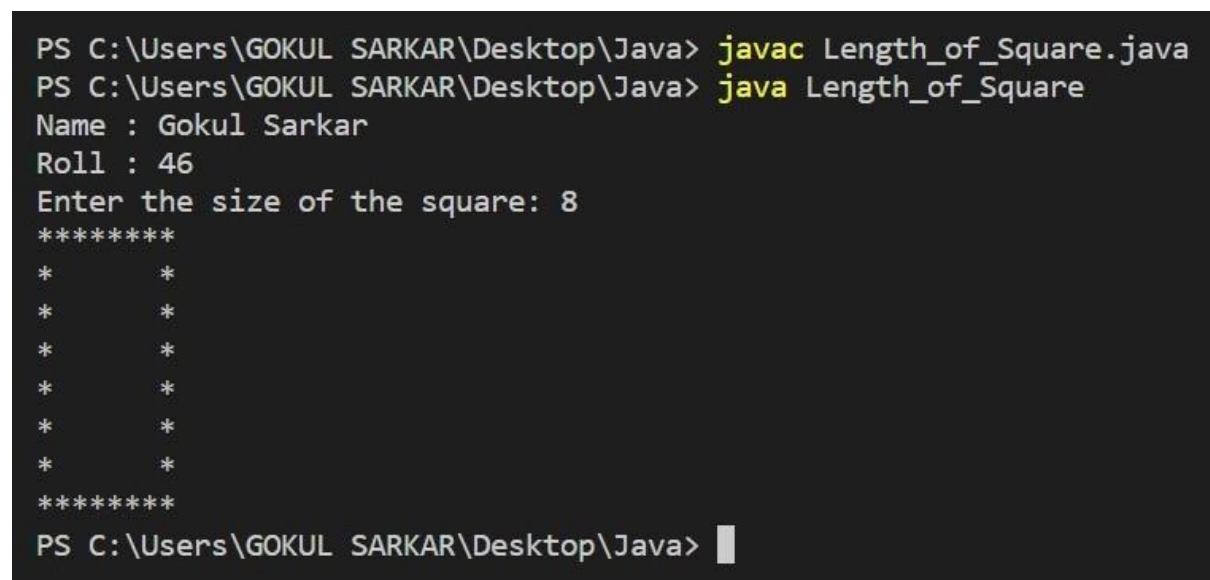
```
import java.util.Scanner;
public class Length_of_Square {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Name : Gokul Sarkar \nRoll : 46");
        System.out.print("Enter the size of the square: ");
        int size = sc.nextInt();
        if (size >= 1 && size <= 20) {
            for (int row = 1; row <= size; row++) {
                for (int col = 1; col <= size; col++) {
                    if (row == 1 || row == size || col == 1 || col == size) {
```

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```
        System.out.print("*");
    } else {
        System.out.print(" ");
    }
}
System.out.println();
}
} else {
    System.out.println("Error: Size must be between 1 and 20.");
}
}
}
```

**Output:**



```
PS C:\Users\GOKUL SARKAR\Desktop\Java> javac Length_of_Square.java
PS C:\Users\GOKUL SARKAR\Desktop\Java> java Length_of_Square
Name : Gokul Sarkar
Roll : 46
Enter the size of the square: 8
*****
*      *
*      *
*      *
*      *
*      *
*      *
*****
PS C:\Users\GOKUL SARKAR\Desktop\Java> █
```

**3. Write a program to compute the following formula.**

**$e = 1/0! + 1/1! + 1/2! + 1/3! + \dots + 1/n!$**

```
import java.math.BigDecimal;
import java.math.RoundingMode;
import java.util.Scanner;
public class Formula {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        BigDecimal e = new BigDecimal("0.0");
        BigDecimal factorial = new BigDecimal("1.0");
        System.out.println("Name : Gokul Sarkar \nRoll : 46");
        System.out.print("Enter the value of n: ");
```

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```
int n = sc.nextInt();
for (int i = 0; i <= n; i++) {
    e = e.add(BigDecimal.ONE.divide(factorial, 100,
RoundingMode.HALF_UP));
    factorial = factorial.multiply(BigDecimal.valueOf(i + 1));
}
System.out.println("The value of e is: " + e.toPlainString());
}
}
```

**Output:**

```
PS C:\Users\GOKUL SARKAR\Desktop\Java> javac Formula.java
PS C:\Users\GOKUL SARKAR\Desktop\Java> java Formula
Name : Gokul Sarkar
Roll : 46
Enter the value of n: 46
The value of e is: 2.7182818286
PS C:\Users\GOKUL SARKAR\Desktop\Java> █
```

**4. Using an enhanced for (for-each) loop, copy the content of one 3-dimensional array to another 3-dimensional array and display its contents.**

```
public class Dimensional {
    public static void main(String[] args) {
        int[][][] arr1 = {{{3, 1, 2}, {5, 4, 6}}, {{9, 7, 8}, {12, 10, 11}}};
        int[][][] arr2 = new int[arr1.length][arr1[0].length][arr1[0][0].length];
        System.out.println("Name : Gokul Sarkar \nRoll : 46");
        for (int[][] a : arr1) {
            for (int[] b : a) {
                for (int c : b) {
                    System.out.print(c + " ");
                }
                System.out.println();
            }
            System.out.println();
        }
        System.out.println("Copying content of arr1 to arr2...");
        int i = 0;
        for (int[][] a : arr1) {
            int j = 0;
```

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```
        for (int[] b : a) {
            int k = 0;
            for (int c : b) {
                arr2[i][j][k++] = c;
            }
            j++;
        }
        i++;
    }
    System.out.println("Content of arr2: ");
    for (int[][] a : arr2) {
        for (int[] b : a) {
            for (int c : b) {
                System.out.print(c + " ");
            }
            System.out.println();
        }
        System.out.println();
    }
}
```

**Output:**

```
PS C:\Users\GOKUL SARKAR\Desktop\Java> javac Dimensional.java
PS C:\Users\GOKUL SARKAR\Desktop\Java> java Dimensional
Name : Gokul Sarkar
Roll : 46
3 1 2
5 4 6

9 7 8
12 10 11

Copying content of arr1 to arr2...
Content of arr2:
3 1 2
5 4 6

9 7 8
12 10 11

PS C:\Users\GOKUL SARKAR\Desktop\Java>
```

Name : Gokul Sarkar  
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### 5. Create the following vase pattern using a loop:

```
*****
\      /
/      \
\      /
/      \
\      /
/      \
*****
```

```
public class Pattern {
    public static void main(String args[]) {
        System.out.println("Name : Gokul Sarkar \nRoll : 46");
        for(int i=1;i<=7;i++) {
            if(i==1 || i==7) {
                System.out.println("*****");
            }
            else {
                System.out.println("\      /");
                System.out.println("/      \");
            }
        }
    }
}
```

**Output:**

```
PS C:\Users\GOKUL SARKAR\Desktop\Java> javac Pattern.java
PS C:\Users\GOKUL SARKAR\Desktop\Java> java Pattern
Name : Gokul Sarkar
Roll : 46
*****
\      /
/      \
\      /
/      \
\      /
/      \
\      /
*****
PS C:\Users\GOKUL SARKAR\Desktop\Java>
```