Aror University of Art, Architecture, Design and Heritage
SUKKUR,Sindh
Department of Multimedia and Gaming
Course: Data Structures CSC-221 (Practical)
Instructor: Engr. Fatima Jaffar

Lab No. 1

Objective: Writing and Execution of simple algorithms in java.

Name: _____ _____ **Roll Number:** _____

Score: _____ **Signature:** _____ **Date:** _____

Example 1: The algorithm of printing two-dimensional array in java.

1. **Input:**
   - Accept a 2D array as input.
   - Determine the number of rows and columns in the array.
     - numRows = number of rows in the array.
     - numCols = number of columns in the array.
2. **Nested Loop:**
   - Use a nested loop structure to iterate through each element of the array.
     - Outer loop (i): Iterate over each row from 0 to numRows - 1.
     - Inner loop (j): Iterate over each column from 0 to numCols - 1.
3. **Print Element:**
   - Print the element at the current row (i) and column (j).
4. **Newline:**
   - After printing all elements in a row, move to the next line.
5. **Repeat:**
   - Repeat steps 3-5 until all elements in the array are printed.

Execution of the above algorithm in java

```java
public class Print2DArray {



    public static void main(String[] args) {
        // Example 2D array
        int[][] myArray = {
            {1, 2, 3},
            {4, 5, 6},
            {7, 8, 9}
        };

        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.print(myArray[i][j]+" ");
            }
            System.out.println();
        }
    }
```

Lab Tasks

1. Write an algorithm and program that takes an array of integers as input and calculates the average of all elements.
2. Create an algorithm and program that computes the factorial of a given positive integer using both iterative and recursive methods.
3. Write the algorithm and Implement a Java program to generate and print the Fibonacci series up to a specified number of terms.
4. Write an algorithm and program that reverses the elements of an array without using any additional data structures.
5. Write a Java program that finds and prints the maximum element in an array of integers.
6. Calculate the power of a number without using the Math.pow() function.