Experiment-6

Demonstrating Array Operations in Java

Write a Java program to find the largest number in an array. The program should take an integer array as input from the user and display the largest number. Implement handling for edge cases such as an empty array.

Aim:

To demonstrate array manipulation techniques in Java, such as finding the largest number in an array.

Objective:

To understand how arrays work in Java and how to perform operations on arrays, such as finding the maximum value.

Program:

```java
import java.util.Scanner;

public class ArrayExample {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n;

        System.out.print("Enter the size of the array: ");
        n = sc.nextInt();

        if (n == 0) {
            System.out.println("Array is empty!");
            return;
        }

        int[] arr = new int[n];
        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }

        int max = arr[0];
        for (int i = 1; i < n; i++) {
            if (arr[i] > max) {
                max = arr[i];
            }
        }

        System.out.println("Largest number in the array: " + max);
    }
```

}

Test Cases:

Test Case 1:

- **Test Name:** Largest Number in Positive Array
- **Input:** Array = {2, 3, 5, 1, 4}
- **Expected Result:** "Largest number in the array: 5"
- **Actual Result:** "Largest number in the array: 5"
- **Pass/Fail:** Pass

Test Case 2:

- **Test Name:** Empty Array
- **Input:** Array = {}
- **Expected Result:** "Array is empty!"
- **Actual Result:** "Array is empty!"
- **Pass/Fail:** Pass

Test Case 3:

- **Test Name:** Array with Negative Numbers
- **Input:** Array = {-3, -5, -2, -1}
- **Expected Result:** "Largest number in the array: -1"
- **Actual Result:** "Largest number in the array: -1"
- **Pass/Fail:** Pass

Conclusion:

This program demonstrates how to manipulate arrays in Java. It finds the largest number in the array by comparing each element. The program also highlights the importance of handling edge cases like empty arrays.