Experiment Number : 04 **Date: 05.02.2026**

ARRAYS

Aim:

To understand and implement array operations in Java.

PRE LAB EXERCISE

QUESTIONS

- ✓ What is an array?

Ans: An array is a collection of same type values stored in one variable.

- ✓ Why are arrays used?

Ans: Arrays are used to store many values using a single name.

- ✓ What is the difference between array and variable?

Ans: Variable: Stores one value

Array: Stores many values

IN LAB EXERCISE

Objective:

To perform array operations using simple programs.

PROGRAMS:

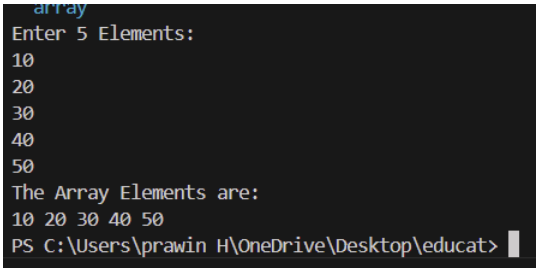
1. Program to Read and Print Array Elements

Code:

```
import java.util.Scanner;
public class ReadPrintArray {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      int[] arr = new int[5];
```

```
        System.out.println("Enter 5 elements:");
        for(int i = 0; i < 5; i++)
            arr[i] = sc.nextInt();
        System.out.println("Array elements are:");
        for(int i = 0; i < 5; i++)
            System.out.print(arr[i] + " ");
    }
}
```

OUTPUT:



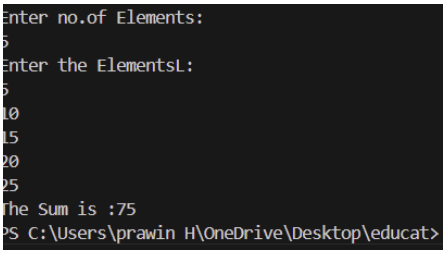
2. Program to Find Sum of Array Elements

Code:

```
import java.util.Scanner;
public class SumArray {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[] arr = new int[5];
        int sum = 0;
        System.out.println("Enter 5 elements:");
        for(int i = 0; i < 5; i++)
            arr[i] = sc.nextInt();
        for(int i = 0; i < 5; i++)
            sum += arr[i];
        System.out.println("Sum = " + sum);
```

```
    }
}
```

OUTPUT:



3. Program to Find Largest Element in an Array

Code:

```
import java.util.Scanner;
public class LargestElement {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[] arr = new int[5];
        System.out.println("Enter 5 elements:");
        for(int i = 0; i < 5; i++)
            arr[i] = sc.nextInt();
        int max = arr[0];
        for(int i = 1; i < 5; i++)
            if(arr[i] > max)
                max = arr[i];
        System.out.println("Largest element = " + max);
    }
}
```

OUTPUT:

```
Enter no.of elements:
5
Enter the Elemnts:
12
45
23
9
30
The Largest Element is : 45
PS C:\Users\prawin H\OneDrive\Desktop\educat>
```

4. Program to Reverse an Array

Code:

```
import java.util.Scanner;


public class ReverseArray {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[] arr = new int[5];
        System.out.println("Enter 5 elements:");
        for(int i = 0; i < 5; i++)
            arr[i] = sc.nextInt();
        System.out.println("Reversed array:");
        for(int i = 4; i >= 0; i--)
            System.out.print(arr[i] + " ");
    }
}
```

```
Enter no.of elements:
5
Enter the Elemnts:
1
2
3
4
5
The Reversed Elements are:
5 4 3 2 1
PS C:\Users\prawin H\OneDrive\Desktop\educat>
```

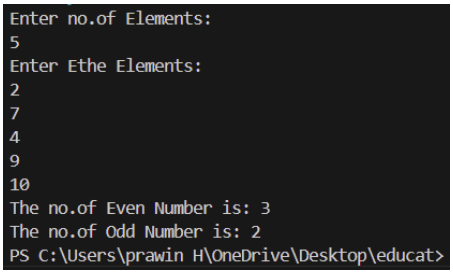
5. Program to Count Even and Odd Numbers

Code:

```
import java.util.Scanner;
public class EvenOddCount {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      int[] arr = new int[5];
      int even = 0, odd = 0;
      System.out.println("Enter 5 elements:");
      for(int i = 0; i < 5; i++)
         arr[i] = sc.nextInt();
      for(int i = 0; i < 5; i++) {
         if(arr[i] % 2 == 0)
            even++;
         else
            odd++;
      }

      System.out.println("Even = " + even);
      System.out.println("Odd = " + odd);
   }
}
```

OUTPUT:

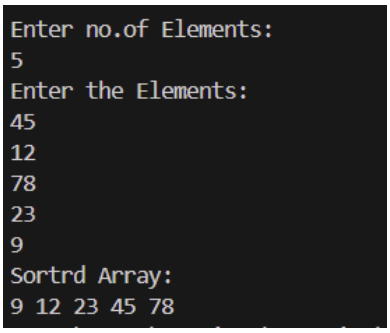


6. Program to Sort Array in Ascending Order

Code:

```
import java.util.Scanner;
public class SortArray {
   public static void main(String[] args) {
      Scanner sc = new Scanner(System.in);
      int[] arr = new int[5];
      int temp;
      System.out.println("Enter 5 elements:");
      for(int i = 0; i < 5; i++)
         arr[i] = sc.nextInt();
      for(int i = 0; i < 5; i++) {
         for(int j = i + 1; j < 5; j++) {
            if(arr[i] > arr[j]) {
               temp = arr[i];
               arr[i] = arr[j];
               arr[j] = temp;
            }
         }
      }
      System.out.println("Sorted array:");
      for(int i = 0; i < 5; i++)
         System.out.print(arr[i] + " ");
   }
}
```

OUTPUT:



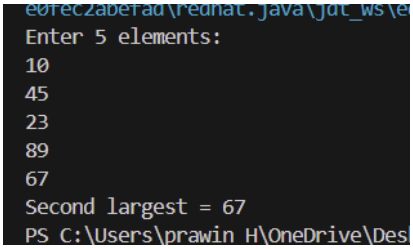
7. Program to Find Second Largest Element

Code:

```
import java.util.Scanner;
public class SecondLargest {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[] arr = new int[5];

        System.out.println("Enter 5 elements:");
        for(int i = 0; i < 5; i++)
            arr[i] = sc.nextInt();
        int largest = arr[0];
        int second = arr[0];
        for(int i = 0; i < 5; i++) {
            if(arr[i] > largest) {
                second = largest;
                largest = arr[i];
            }
        }
        System.out.println("Second largest = " + second);
    }
}
```

OUTPUT:



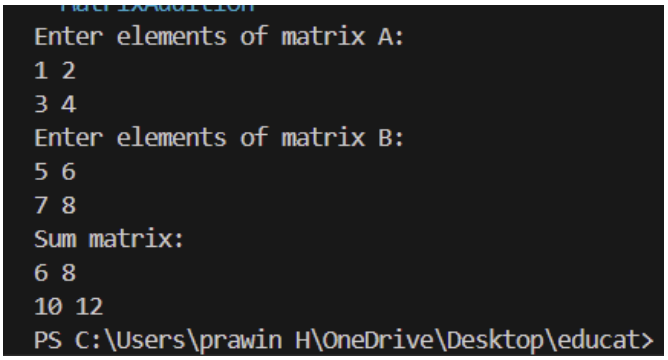
8. Program for Matrix Addition (2D Array)

Code:

```
import java.util.Scanner;
public class MatrixAddition {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int[][] a = new int[2][2];
        int[][] b = new int[2][2];
        int[][] sum = new int[2][2];
        System.out.println("Enter elements of matrix A:");
        for(int i = 0; i < 2; i++)
            for(int j = 0; j < 2; j++)
                a[i][j] = sc.nextInt();
        System.out.println("Enter elements of matrix B:");
        for(int i = 0; i < 2; i++)
            for(int j = 0; j < 2; j++)
                b[i][j] = sc.nextInt();
        for(int i = 0; i < 2; i++)
            for(int j = 0; j < 2; j++)
                sum[i][j] = a[i][j] + b[i][j];
        System.out.println("Sum matrix:");
        for(int i = 0; i < 2; i++) {
            for(int j = 0; j < 2; j++)
```

```
            System.out.print(sum[i][j] + " ");
        System.out.println();
    }
  }
}
```

OUTPUT:



POST LAB EXERCISE

- ✓ Why is array indexing usually started from zero instead of one?

Ans: Because the first element is stored at the first memory location, and its position is counted as 0.

- ✓ What happens if we try to access an array element outside its declared size?

Ans: The program gives a runtime error.

- ✓ How does memory allocation differ for static arrays and dynamic arrays?

Ans: Static array : Fixed size

Dynamic array: Size can change at runtime

- ✓ Why is searching faster in arrays compared to linked lists?

Ans: Because arrays allow direct access using index.

- ✓ What is the difference between contiguous and non-contiguous memory allocation?

Ans: Contiguous : Stored continuously (array)

Non-contiguous: Stored separately (linked list)

Result:

Thus the array operations were executed successfully.

ASSESSMENT

Description	Max Marks	Marks Awarded
Pre Lab Exercise	**5**	
In Lab Exercise	**10**	
Post Lab Exercise	**5**	
Viva	**10**	
Total	**30**	
Faculty Signature		