OOPS PRACTICAL 5

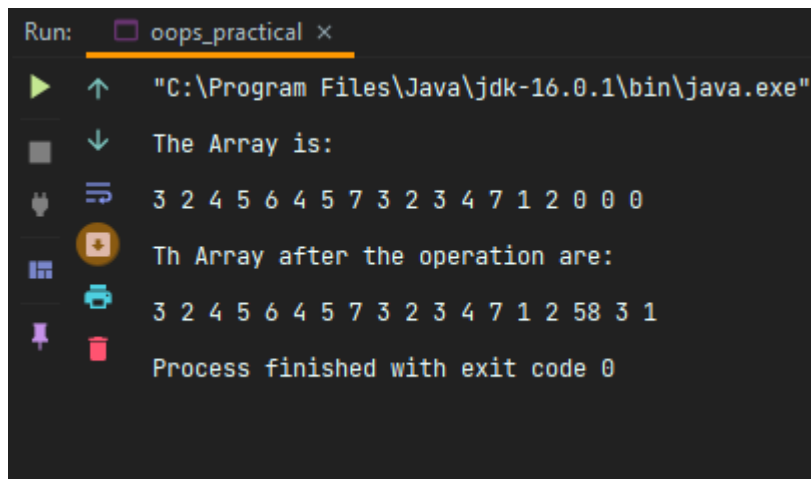**Name: Devasy Patel**

Roll No: 20BCE057

Course Code: 2CS302

Course Name: Object Oriented Programming

Practical-5A

```java
public class oops_practical {
    public static void main(String[] args) {
        //Prac 5A
        int [] A={3,2,4,5,6,4,5,7,3,2,3,4,7,1,2,0,0,0};
        int sum=0;
        int alen= A.length;
        System.out.println("The Array is:");
        for(int i=0;i<alen;i++){
            System.out.print(A[i]+" ");
        }
        for(int i=0;i<=14;i++){
            sum=sum+A[i];
        }
        int avg=sum/15;
        A[15]=sum;
        A[16]=avg;
        int min=A[0];
        for(int i=0;i<14;i++){
            if(min>A[i]){
                min=A[i];
            }
        }
        A[17]=min;
        System.out.println("\nTh Array after the operation are:");
        for(int i=0;i<alen;i++){
            System.out.print(A[i]+" ");
        }
    }
}
```

OUTPUT

```
Run:      oops_practical ×

         "C:\Program Files\Java\jdk-16.0.1\bin\java.exe"

         The Array is:

         3 2 4 5 6 4 5 7 3 2 3 4 7 1 2 0 0 0

         Th Array after the operation are:

         3 2 4 5 6 4 5 7 3 2 3 4 7 1 2 58 3 1

         Process finished with exit code 0
```

THEORETICAL PRINCIPLES USED:

In this program we have an array of 18 elements which is already given. By using simple array operation we store sum of first 15 elements at index 15, average of that at index 16 and the least element from first 15 elements at index 17.

Practical-5B

```java
import java.util.*;
public class oops_practical {
    public static void main(String[] args) {
        //Prac 5B (sorting)
            Scanner sc=new Scanner(System.in);
        System.out.print("Enter n:");
        int n=sc.nextInt();
        int [] arr=new int[n];
        //Taking values in array
        for(int i=0;i<n;i++){
            System.out.printf("arr[%d]:",i);
            arr[i]=sc.nextInt();
        }
        //Printing array
        System.out.println("The array is:");
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
        //Sorting of array
        for(int i=0;i<n;i++){
            for(int j=i;j<n;j++){
                if(arr[i]>arr[j]){
                    int temp=arr[i];
                    arr[i]=arr[j];
                    arr[j]=temp;
                }
            }
        }
        System.out.println("\nThe sorted array in ascending order is:");
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
        for(int i=0;i<n;i++){
            for(int j=i;j<n;j++){
                if(arr[i]<arr[j]){
                    int temp=arr[i];
                    arr[i]=arr[j];
                    arr[j]=temp;
                }
            }
        }
        System.out.println("\nThe sorted array in descending order is:");
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
    }
}
```

OUTPUT

```
Run:    oops_practical ×

        "C:\Program Files\Java\jdk-16.0.1\bin\java.exe" "-javaagent:C:
        Enter n:6
        arr[0]:12
        arr[1]:23
        arr[2]:45
        arr[3]:45
        arr[4]:33
        arr[5]:12
        The array is:
        12 23 45 45 33 12
        The sorted array in ascending order is:
        12 12 23 33 45 45
        The sorted array in descending order is:
        45 45 33 23 12 12
        Process finished with exit code 0
```

THEORETICAL PRINCIPLES USED:

In this program we are given an array by user and then we are sorting them in both ascending and descending order and printing them.

Practical-5C

```java
import java.util.*;
public class oops_practical {
    public static void main(String[] args) {
        //Prac 5C adda and multiply of given matrices.
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter number of rows for matrix 1:");
        int m=sc.nextInt();
        System.out.print("Enter number of columns for matrix 1:");
        int n=sc.nextInt();
        System.out.print("Enter number of rows for matrix 2:");
        int m5=sc.nextInt();
        System.out.print("Enter number of columns for matrix 2:");
        int n5=sc.nextInt();
        int m1[][]=new int[m][n];
        int m2[][]=new int[m5][n5];
        int m3[][]=new int[m][n];
        int m4[][]=new int[m][n5];
        System.out.println("Enter elements for M1:");
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                System.out.printf("m1[%d][%d]:",i,j);
                m1[i][j]=sc.nextInt();
            }
        }
        System.out.println("The First Array is:");
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                System.out.print(m1[i][j]+"\t");
            }
            System.out.println("\n");
        }
        System.out.println("Enter elements for M2:");
        for(int i=0;i<m5;i++){
            for(int j=0;j<n5;j++){
                System.out.printf("m1[%d][%d]:",i,j);
                m2[i][j]=sc.nextInt();
            }

        }
        System.out.println("The Second Array is:");
        for(int i=0;i<m5;i++){
            for(int j=0;j<n5;j++){
                System.out.print(m2[i][j]+"\t");
            }
            System.out.println("\n");
        }
        if(m==m5 && n==n5){
        for(int i=0;i<m;i++) {
            for (int j = 0; j < n; j++) {
                m3[i][j]=m1[i][j]+m2[i][j];
            }
        }

        System.out.println("The Addtion Array is:");
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                System.out.print(m3[i][j]+"\t");
            }
            System.out.println("\n");
        }
        }
        else{
            System.out.println("Addition NOt possible.");
        }
        if(m5!=n){
```

```java
            System.out.println("Multiplication not possible!!");
        }
        else{
        System.out.println("The Multiplication Array is :");
        for(int i=0;i<m;i++) {
            for (int j = 0; j < n5; j++) {
                for (int k = 0;  k < m5;  k++) {
                    m4[i][j]=m4[i][j]+(m1[i][k]*m2[k][j]);
                }
            }
        }
        for(int i=0;i<m;i++){
            for(int j=0;j<n5;j++){
                System.out.print(m4[i][j]+"\t");
            }
            System.out.println("\n");
        }
    }
}
```

OUTPUT

THEORETICAL PRINCIPLES USED:

In this program, user input two matrix with their row and column. By comparing the order we decide whether the addition and multiplication of matrix is allowed or not allowed. If column of M1= row of M2, then multiplication of matrix is allowed and addition is allowed if both matrix consists of similar dimensions.