Object Oriented Programming using Java Laboratory (DJS23FLES201)
Academic Year 2023-24

EXPERIMENT NO. 2

NAME-SHAIKH ARSHAD AJIJ

ROLL NO. -B007

SAP ID- 60019230064

BRANCH- CSE-ICB

BATCH -B1

AIM / OBJECTIVE:

Implementing Arrays in JAVA

2. **To implement Arrays**

a. You have been given an array of positive integers A1, A2,...,An with length N and you have to print an array of same length (N) where the values in the new array are the sum of every number in the array, except the number at that index.

i/p 1 2 3 4
For the 0th index, the result will be 2+3+4= 9, similarly for the second, third and fourth index the corresponding results will be 8, 7 and 6 respectively.
i/p 4 5 6
o/p 11 10 9

Program :

```
import java.util.*;
public class Main {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);

      System.out.println("Enter the size of the array:");
      int N = scanner.nextInt();
      int[] array = new int[N];

      System.out.println("Enter the elements of the array:");
      for (int i = 0; i < N; i++) {
         array[i] = scanner.nextInt();
      }
      int sum=0;
      for (int i = 0; i < N; i++) {
```

```
        sum+= array[i];
      }

      int[] new_array = new int[N];
      for (int i = 0; i < N; i++) {
        new_array[i] = sum - array[i];
      }

      System.out.print("Your old array is : ");
      for (int i = 0; i < N; i++) {
        System.out.print(array[i] + " ");
      }

      System.out.println();


      System.out.print("Your new array is : ");
      for (int i = 0; i < N; i++) {
        System.out.print(new_array[i] + " ");
      }

    }
}
```

Output:

```
C:\Users\Arshad\Desktop\study\java>java Main.java
Enter the size of the array:
5
Enter the elements of the array:
1 2 3 4 5
Your old array is : 1 2 3 4 5
Your new array is : 14 13 12 11 10
C:\Users\Arshad\Desktop\study\java>
```

b. The annual examination results of 5 students are tabulated as follows:

Roll No	Subject1	Subject2	Subject3

WAP to read the data and determine the following
Total marks obtained by each student

The student who obtained the highest total marks

Program :

```
import java.util.Scanner;
public class Main {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);

      // There are 5 students and 3 subjects

      int[] roll = new int[5];
      int[][] subjectMarks = new int[5][3];

      // Read student data
      for (int i = 0; i < 5; i++) {
         System.out.println("Enter Roll No. : ");
         roll[i] = scanner.nextInt();

         System.out.println("Enter marks for Subject1 : ");
         subjectMarks[i][0] = scanner.nextInt();

         System.out.println("Enter marks for Subject2 : ");
         subjectMarks[i][1] = scanner.nextInt();

         System.out.println("Enter marks for Subject3 : ");
         subjectMarks[i][2] = scanner.nextInt();
      }

      int highest= 0;
      int studentWithHighestMarks = -1;

      System.out.println("\nTotal marks obtained by each student:");
      for (int i = 0; i < 5; i++) {
         int totalMarks = subjectMarks[i][0] + subjectMarks[i][1] + subjectMarks[i][2];
         System.out.println(" Roll No. " + roll[i] + ": " + totalMarks);

         if (totalMarks > highest) {
            highest = totalMarks;
            studentWithHighestMarks = roll[i];
         }
      }

      // Display the student with the highest total marks
      System.out.println("\nThe student who obtained the highest total marks is: Roll No. "
+ studentWithHighestMarks);

   }
}
```

```
C:\Users\Arshad\Desktop\study\java>java Main.java
Enter Roll No. : 7
Enter marks for Subject1 : 95
Enter marks for Subject2 : 97
Enter marks for Subject3 : 91
Enter Roll No. : 8
Enter marks for Subject1 : 65
Enter marks for Subject2 : 56
Enter marks for Subject3 : 55
Enter Roll No. : 9
Enter marks for Subject1 : 53
Enter marks for Subject2 : 59
Enter marks for Subject3 : 22
Enter Roll No. : 10
Enter marks for Subject1 : 95
Enter marks for Subject2 : 52
Enter marks for Subject3 : 55
Enter Roll No. : 11
Enter marks for Subject1 : 32
Enter marks for Subject2 : 35
Enter marks for Subject3 : 78

Total marks obtained by each student:
 Roll No. 7: 283
 Roll No. 8: 176
 Roll No. 9: 134
 Roll No. 10: 202
 Roll No. 11: 145

The student who obtained the highest total marks is: Roll No. 7
```

c. WAP to display following pattern using irregular arrays (jagged arrays).

1
1 2
1 2 3 ……..

Program :

```
import java.util.*;
public class Main {
   public static void main(String[] args) {
      // Define the size of the jagged array
      int r;
      Scanner scanner = new Scanner(System.in);
```

```
        System.out.print("Enter The No. of Rows : ");
        r=scanner.nextInt();
         int[][] arr = new int[r][];

         for (int i = 0; i < r; i++) {
            arr[i] = new int[i + 1];
            for (int j = 0; j <= i; j++) {
                arr[i][j] = j + 1;            }
         }

         // Display the jagged array
         System.out.println("The pattern using jagged array is:");
         for (int i = 0; i < r; i++) {
            for (int j = 0; j < arr[i].length; j++) {
                System.out.print(arr[i][j] + " ");
            }
            System.out.println();
         }
      }
}
```

Output:

```
Enter The No. of Rows : 3
The pattern using jagged array is:
1
1 2
1 2 3
```

CONCLUSION:

We did various array operations, including creating arrays, populating them with values, and printing their contents.We discussed jagged arrays (irregular arrays) and how to use them to create patterns or represent data structures where each row can have a different length.We solved problems such as calculating the sum of elements in an array, displaying patterns using jagged arrays, and determining certain metrics based on input data. We implemented algorithms to calculate total marks obtained by students and identify the student with the highest total marks.

Website References: https://www.javatpoint.com