Object Oriented Lab:

Assignment 01:

Problem (1 – 16):

Objectives:

- ❖ Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.
- ❖ Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- ❖ To be aware of the important topics and principles of software development.
- ❖ To be able to use the Java SDK environment to create, debug and run simple Java programs.
- ❖ To implement classical problems using java programming.
- ❖ Write arithmetic expressions to accomplish a task.
- ❖ Use casting to convert between primitive types.
- ❖ Use a value-returning library method and a library constant.
- ❖ Communicate with the user by using the Scanner class or dialog boxes
- ❖ Use String methods to manipulate string data.
- ❖ Be able to document a program.
- ❖ To be familiar with syntax and structure of Java programming.
- ❖ In this assignment, we know about string and array. The size of an array must be specified by an int value and not long or short. A Java array variable can also be declared like other variables with [] after the data type.
- ❖ To java string class provides a lot of methods to perform operations on string such as compare(), concat(), equals(), split(), length(), replace(), compareTo(), intern(), substring() etc.
- ❖ To knowing problem1, how to find the maximum and minimum value of an array.
- ❖ To learn how to solve any problem in Java programming language with their given problem's information.
- ❖ To know problem 2, how to reverse an array of integer values.
- ❖ To doing problem 3, we gain our knowledge to find the duplicate values of an array of integer values.
- ❖ To learn program to find the duplicate values of an array of string values in problem 4.
- ❖ In problem 5 & problem 6, we also know how to find the common elements between two arrays & to find the common elements between two arrays of integers.
- ❖ To doing problem 7, we also know about a Java program how to remove duplicate elements from an array.

- ❖ In problem 8, we understand how to find the second largest element in an array.
- ❖ Also in problem 9, we solve this program to find the second smallest element in an array.
- ❖ And also in problem 10, we know how to add two matrices of the same size.

Problem 1:

1. Write a Java program to find the maximum and minimum value of an array.

Source code:

```java
package maxandminvalue;

public class Maxandminvalue {

public static void main(String[] args) {

int a[] = new int[] { 23, 34, 13, 64, 72, 100, 10, 15, 4, 27 };

int min = a[0];

int max = a[0];

for (int i = 1; i < a.length; i++)

    {

    if (a[i] > max)

    {

    max = a[i];

    }

    if (a[i] < min)

    {

    min = a[i];

    }

    }

System.out.println("Maximum Number is : " + max);

System.out.println("Minimum Number is : " + min);
```

```
}
}
```

Output:

Maximum Number is: 100

Minimum Number is: 4

Problem 2:

2. Write a Java program to reverse an array of integer values.

Source code:

```
package reversearrayofinteger;
public class Reversearrayofinteger {
public static void main(String[] args) {
int[] numbers = { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 };
System.out.println("Array before reverse:");
for (int i = 0; i < numbers.length; i++) {
System.out.print(numbers[i] + " ");
}
for (int i = 0; i < numbers.length / 2; i++) {
int temp = numbers[i];
numbers[i] = numbers[numbers.length - 1 - i];
numbers[numbers.length - 1 - i] = temp;
}
System.out.println("\nArray after reverse:");
for (int i = 0; i < numbers.length; i++) {
System.out.print(numbers[i] + " ");
}
}
```

}

Output:

Array before reverse:

1 2 3 4 5 6 7 8 9 10

Array after reverse:

10 9 8 7 6 5 4 3 2

Problem 3:

3. Write a Java program to find the duplicate values of an array of integer values.

Source code:

```java
package duplicateintegevaluesr;

public class Duplicateintegevaluesr {

public static void main(String[] args) {

int[] a = {40, 32, 55, 32, 85, 70, 85, 55};

for (int i = 0; i < a.length-1; i++)

{

for (int j = i+1; j < a.length; j++)

{

if ((a[i] == a[j]) && (i != j))

{

System.out.println("Duplicate Element : "+a[j]);

}

}

}

}
```

Output:

Duplicate Element: 32

Duplicate Element: 55

Duplicate Element: 85

Problem 4:

4. Write a Java program to find the duplicate values of an array of string values.

Source code:

```java
package duplicatestringvalues;

public class Duplicatestringvalues {

public static void main(String[] args) {

String[] a = {"abc", "cde", "fgh", "abc", "ijk", "fgh"};

for (int i = 0; i < a.length-1; i++)

{

for (int j = i+1; j < a.length; j++)

{

if ((a[i].equals(a[j])) && (i != j))

{

System.out.println("Duplicate Element : "+a[j]);

}

}

}

}}
```

Output:

Duplicate Element: abc

Duplicate Element: fgh

Problem 5:

5. Write a Java program to find the common elements between two arrays.

Source code:

```java
package commonelementsofinteger;

public class Commonelementsofinteger {

public static void main(String[] args) {

int[] a1 = {22,44,33,77,99};

int[] a2 = {33,22,12,99,40,32,44};

for(int i = 0; i < a1.length; i++)

{

for(int j = 0; j < a2.length; j++)

{

if(a1[i] == a2[j])

{

System.out.println(a1[i]);

}

}

}

}

}
```

Output:

22

44

33

99

Problem 6:

6. Write a Java program to find the common elements between two arrays of integers..

Source code:

```
package commonelementsofinteger;

public class Commonelementsofinteger {

public static void main(String[] args) {

int[] a1 = {22,44,33,77,99};

int[] a2 = {33,22,12,99,40,32,44};

for(int i = 0; i < a1.length; i++)

{

for(int j = 0; j < a2.length; j++)

{

if(a1[i] == a2[j])

{

System.out.println(a1[i]);

}

}

}

}

}
```

Output:

22

44

33

99

Problem 7:

7. Write a Java program to remove duplicate elements from an array.

Source code:

```java
package removeduplicateelement07;

import javax.swing.JOptionPane;
public class Removeduplicateelement07 {
public static void main(String[] args) {
// TODO code application logic here
int n[] = new int[5];

for(int i = 0; i < 5; i++)
{
n[i] = Integer.parseInt(JOptionPane.showInputDialog("Input the Integer :"));

}
System.out.println("Input an Array : ");
for(int i = 0; i < 5; i++)
{
System.out.println("Number["+i+"] = "+n[i]);
}
System.out.println(" =========================== ");

for(int i = 0; i < 5; i++)
{
for(int j = i + 1; j < 5; j++)
{
if(n[i] == n[j])
{
n[j] = -1;
}
}
}
System.out.println("After removing duplicates : ");
for(int i = 0; i < 5; i++)
{
System.out.println("Number["+i+"] = "+n[i]);
}
}
```

}
Output:

Input an Array :
Number[0] = 1
Number[1] = 2
Number[2] = 1
Number[3] = 2
Number[4] = 5
 ==========================
After removing duplicates :
Number[0] = 1
Number[1] = 2
Number[2] = -1
Number[3] = -1
Number[4] = 5

Problem 8:

8. Write a Java program to find the second largest element in an array.

Source code:

```java
package secondlargestnumber;

import java.util.Scanner;

public class Secondlargestnumber {

public static void main(String[] args) {

{

// intialise here

int n, max;

// create object of scanner class

Scanner scan = new Scanner(System.in);

// enter total number of elements

System.out.print("Enter total number of elements : ");

n = scan.nextInt();
```

```java
// creating array object
int a[] = new int[n];
// enter the elements
System.out.println("Enter all the elements:");
for (int i = 0; i < n; i++)
{
a[i] = scan.nextInt();
}
for (int i = 0; i < n; i++)
{
for (int j = i + 1; j < n; j++)
{
if(a[i] <= a[j])
{
} else {
max = a[i];
a[i] = a[j];
a[j] = max;
}
}
}
System.out.println("The Second Largest Elements in the Array is :"+a[n-2]);
}
}


}
```

Output:

Enter total number of elements: 5

Enter all the elements:

25

32

89

74

15

The Second Largest Elements in the Array is: 74

Problem 9:

9.Write a Java program to find the second smallest element in an array.

Source code:

```
package secondsmallestnumber;

import java.util.Scanner;

public class Secondsmallestnumber {

public static void main(String[] args) {

// intialise here

int n, min;


// create object of scanner class

Scanner scan = new Scanner(System.in);


// enter total number of elements

System.out.print("Enter  total number of elements : ");

n = scan.nextInt();
```

```java
// creating array object.
int a[] = new int[n];


// enter the elements
System.out.println("Enter  all the elements : ");
for (int i = 0; i < n; i++)
{
a[i] = scan.nextInt();
}
for (int i = 0; i < n; i++)
{
for (int j = i + 1; j < n; j++)
{
if (a[i] > a[j])
{

min = a[i];
a[i] = a[j];
a[j] = min;
}
}
}
System.out.println("The  Second smallest element in the array is :"+a[1]);
}
}
```

Output:

Enter total number of elements: 5

Enter all the elements:

56

89

36

12

45

The Second smallest element in the array is: 36

Problem 10:

10. Write a Java program to add two matrices of the same size.

Source code:

```
package addtwomatrics10;

import java.util.Scanner;

public class Addtwomatrics10 {

public static void main(String[] args) {

// TODO code application logic here

int i,j;

Scanner scan = new Scanner (System.in);


System.out.print("Enter the number of rows : ");

int rows = scan.nextInt();

System.out.print("Enter the number of columns : ");

int columns = scan.nextInt();

int[][] a = new int[rows][columns];

int[][] b = new int[rows][columns];

int[][] s = new int[rows][columns];//sum = a+b
```

```java
System.out.println("Enter the First matrix : ");

for(i = 0; i < rows; i++)

{

for (j = 0; j < columns; j++)

{

a[i][j] = scan.nextInt();

}

}

System.out.println("Enter the Second matrix : ");

for(i = 0; i < rows; i++)

{

for (j = 0; j < columns; j++)

{

b[i][j] = scan.nextInt();

}

}

for(i = 0; i < rows; i++)

{

for (j = 0; j < columns; j++)

{

s[i][j] = a[i][j] + b[i][j];

}

}

System.out.println("Sum of the two matrices : ");

for(i = 0; i < rows; i++) {

for(j = 0; j < columns; j++) {

System.out.print(s[i][j] + "\t");
```

```
}
System.out.println();

}}}
```

Output:

Enter the number of rows: 2

Enter the number of columns: 2

Enter the First matrix:

4

5

1

2

Enter the Second matrix:

5

2

3

6

Sum of the two matrices:

9   7

4   8

Discussion:

By doing those problems in the assignment, we have to face different kind of logics, string, array and also Mathematical logics. So after doing the above study we have understood how to create a class and a main function in java and we have understood the concept and various operations on strings. Doing those problems, we have to know the concept of packages, how to create a package and how to import package and also know the concept of final statement. Sometimes we have to face some values problem. Some of few problems can't run first time, then find out what's the problem and fix it. Finally, we solved all the problems. And overcome it.