

**LABORATORY MANNUAL
FOR
OBJECT ORIENTED PROGRAMMING
USINGJAVA**

**3rdSemester
Diploma in Computer Science & Engineering**



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Experiment1:-

Write a Java program to print 'Hello' on screen and then print your name on a separate line.

SourceCode:

```
class Exercise1
{
    public static void main(String args[])
    {
        System.out.println("Hello!");
        System.out.println("Swagat Das");
    }
}
```

OUTPUT:-

```
Hello
Swagat Das
```

Experiment2:-

Write a Java program to print the sum of two numbers.

SourceCode:

```
import java.util.Scanner;

class Sum
{
    public static void main(String []args)
    {
        Scanner input = new Scanner (System.in);
        System.out.print("Input the first number:");
        int num1 = input.nextInt();
        System.out.print("Input the second number:");
        Int num2 =input.nextInt();
        int sum = num1 + num2;
        System.out.println("Sum of two numbers is:"+sum);
    }
}
```

OUTPUT:-

Input the first number: 15

Input the second number: 20

Sum of two numbers is: 35

Experiment3:-

Write a Java program that takes a number as input and prints its multiplication table upto10.

SourceCode:

```
import java.util.Scanner;
class Mtable
{
    public static void main(String[] args)
    {
        Int i;
        Scanner in = new Scanner(System.in);
        System.out.print("Input a number: ");
        int num1 = in.nextInt();
        for(i=1;i<=10;i++)
        {
            System.out.println(num1+"x"+ i+"= "+num1*i);
        }
    }
}
```

OUTPUT:-

```
Input a number:8
8 x1 =8
8 x2 =16
8 x3 =24
8 x4 =32
8 x5 =40
8 x6 =48
8 x7 =56
8 x8 =64
8 x9 =72
8 x10 =80
```

Experiment4:-

Write a Java program to print the area and perimeter of a rectangle.

SourceCode:

```
import java.util.Scanner;
class Rectangle
{
    public static void main(String[] args)
    {
        int l, b, perimeter, area;
        Scanner ob = new Scanner(System.in);
        System.out.print("Enter length of rectangle:");
        l=ob.nextInt();
        System.out.print("Enter breadth of rectangle:");
        b=ob.nextInt();
        perimeter=2* (l+b);
        System.out.println("Perimeter of rectangle:"+perimeter);
        area =l * b;
        System.out.println("Area of rectangle:"+area);
    }
}
```

OUTPUT:-

```
Enter length of rectangle:5
Enter breadth of rectangle:4
Perimeter of rectangle:18
Area of rectangle:20
```

Experiment5:-

Write a Java program to swap two variables.

SourceCode:

```
import java.util.Scanner;
class Swap
{
    public static void main(String []args)
    {
        int x,y, z;
        Scanner ob = new Scanner(System.in);
        System.out.print("Input the first number:");
        x=ob.nextInt();
        System.out.print("Input the second number:");
        y=ob.nextInt();
        z=x;
        x=y;
        y=z;
        System.out.println("Swapped values are:"+x+" and "+y);
    }
}
```

OUTPUT:-

```
Input the first number: 15
Input the second number: 22
Swapped values are:22 and 15
```


Experiment6:-

Write a Java program to convert a decimal number to binary number.

SourceCode:

```
import java.util.Scanner;
class D2BNumber
{
    public static void main(String args[])
    {

        int dnum, quot, i = 1, j;
        int bnum[]=new int[50];
        Scanner scan = new Scanner(System.in);
        System.out.print("Inputa Decimal Number:");
        dnum= scan.nextInt();
        quot = dnum;
        while(quot!=0)
        {
            bnum[i]=quot%2;
            quot = quot / 2;
            i++;
        }
        System.out.print("Binary number is:");
        for (j = i - 1; j > 0; j--)
        {
            System.out.print(bnum[j]);
        }
        System.out.print("\n");
    }
}
```

OUTPUT:-

Input a Decimal Number:9

Binary number is: 1001

Experiment7:-

Write a Java program to compare two numbers.

SourceCode:

```
import java.util.Scanner;

class Compare
{
    public static void main(String args[])
    {
Scanner input = new Scanner(System.in);
int num1;
int num2;
System.out.print("Input first number:");
num1=input.nextInt();
System.out.print("Input second number:");
num2=input.nextInt();
if(num1 ==num2)
    System.out.printf("%d==%d\n",num1,num2);
if(num1 !=num2)
    System.out.printf("%d != %d\n", num1, num2);
if(num1 <num2)
    System.out.printf("%d < %d\n", num1, num2);
if(num1 >num2)
    System.out.printf("%d > %d\n", num1, num2);
if(num1 <=num2)
    System.out.printf("%d<=%d\n",num1,num2);
if(num1 >=num2)
    System.out.printf("%d>=%d\n",num1,num2);
    }
}
```

OUTPUT:-

Input first integer: 25

Input second integer:39

25 !=39

25 <39

25<=39

Experiment8:-

Write a Java program and compute the sum of the digits of an integer.

SourceCode:

```
import java.util.Scanner;
class SumDigit
{
    public static void main(String []args)
    {
        Scanner in=new Scanner(System.in);
        System.out.print("Input an integer: ");
        int digits=in.nextInt();
        System.out.println("The sum is:"+sumDigits(digits));
    }
    public static int sumDigits(long n)
    {
        int result = 0;
        while(n>0)
        {
            result+=n%10;
            n /= 10;
        }
        return result;
    }
}
```

OUTPUT:-

Input an integer: 1532

The sum is: 11

Experiment9:

Write a Java program to count the letters, spaces, numbers and other characters of an input string.

SourceCode:

```
import java.util.Scanner;
class CountStr
{
    public static void main(String []args)
    {
        String test=" The string is :Hello World: Hi Good evening @$; #78945612";
        count(test);
    }
    public static void count(String x)
    {
        char[] ch=x.toCharArray();
        int letter = 0;
        int space=0;
        int num = 0;
        int other=0;
        for(int i=0;i<x.length();i++)
        {
            if(Character.isLetter(ch[i]))
            {
                letter++;
            }
            else if(Character.isDigit(ch[i]))
            {
                num++;
            }
            else if(Character.isSpaceChar(ch[i]))
            {
                space++;
            }
            else
            {
                other++;
            }
        }
        System.out.println("The string is : Hello World: Hi Good evening @$; #78945612");
    }
}
```

```
System.out.println("letter:"+letter);  
System.out.println("space: " + space);  
System.out.println("number:"+num);  
System.out.println("other:"+other);  
}  
}
```

OUTPUT:-

The string is : The string is :Hello World: Hi Good evening @\$; #78945612

letter:23

space:6

number:8

other:6

Experiment 10:-

Write a Java program to reverse a string.

SourceCode:

```
import java.util.Scanner;
class ReverseStr
{
public static void main(String []args)
{
    Scanner sc=new Scanner(System.in);
    System.out.print("Input a string: ");
char []letters=sc.nextLine().toCharArray();
System.out.print("Reverse string:");
for(int i=letters.length-1;i>=0;i--)
{
    System.out.print(letters[i]);
    }
    System.out.print("\n");
}
}
```

OUTPUT:-

Input a string: Hello World

Reverse string: dlroW olleHT

Experiment11:-

Write a Java program to accept a number and check the number is even or not. Prints 1 if the number is even or 0 if the number is odd.

SourceCode:

```
import java.util.*;

class Exercise49
{
    public static void main(String[] args)
    {
        Scanner in=new Scanner(System.in);
        System.out.print("Input a number:");
        int n =in.nextInt();

if (n %2 ==0)
{
    System.out.println(1); //If the number is even, print 1
}
else
{
    System.out.println(0); //Ifthenumberisodd,print 0
}
}
}
```

OUTPUT:-

```
Input a number:100
1
```

Experiment12

Write a Java program that accepts two integer values from the user and return the larger values. However if the two values are the same, return 0 and return the smaller value if the two values have the same remainder when divided by 6.

SourceCode:

```
import java.util.*;
class CompareTwo
{
public static void main(String []args)
{
    Scanner in = new Scanner(System.in);
    System.out.print("Input the first number:");
    int a=in.nextInt();
    System.out.print("Input the second number:");
    int b=in.nextInt();
    System.out.println("Result:"+result(a,b));
}
    public static int result(int x,int y)
    {
        if(x==y)
            return 0;
        if(x%6==y%6)
            return (x <y)?x : y;
        return (x >y)?x : y;
    }
}
```

OUTPUT:-

```
Input the first number: 12
Input the second number:13
Result:13
```


Experiment13:-

Write a Java program to get the larger value between first and last element of an array(length3)of integers.

SourceCode:

```
import java.util.Arrays;
class LargeArray
{
public static void main(String []args)
{
    int []array={20,30, 40};
    System.out.println("OriginalArray:"+Arrays.toString(array));
    int maxval= array[0];
    if(array[1] >= maxval)
        maxval=array[1];
    if(array[2] >= maxval)
        maxval=array[2];

    System.out.println("Larger value between first and last element of Array:"+maxval);
}
}
```

OUTPUT:-

Original Array:[20,30, 40]

Larger value between first and last elementof Array:40

Design a class to represent a bank account. Include the following members:

Data members:

- Name of the depositor
- Account Number
- Type of account
- Balance amount in the account

Methods:

- To assign initial values
- To deposit an amount
- To withdraw an amount
- To display the name and balance

SourceCode:

```
package practice;
import java.io.*;
import java.util.*;
import java.util.Scanner;
import java.util.Random;

class Bank
{
public String nameDepositor;
public int accNumber;
public String accType;
public double balanceAmount;
public void assignValues(String nameDepositor,String accType,double balanceAmount)
{
this.nameDepositor=nameDepositor;
this.accType=accType;
this.balanceAmount=balanceAmount;

Random random =new Random();
this.accNumber=random.nextInt(1000000);
System.out.println("Your new account number is:"+accNumber);
}
public void depositAmount(double amount)
{
if(accNumber==0)
```

```

System.out.println("!You don't have bank account to deposit\nNote: Please assign values to
create an account");
else
    {
        balanceAmount+=amount;
        System.out.println("Amount deposited successfully.");
    }
}
public void withdrawAmount(double amount)
{
    if(accNumber==0)
        System.out.println("!You don't have bank account to credit\nNote:Please assign values to
create an account");
    else if(balanceAmount>amount)
        {
            balanceAmount-=amount;
            System.out.println("Amount debited successfully. ");
        }
    else
        System.out.println("!Insufficient balance");
}
public void displayDetails()
{
    if(accNumber==0)
        System.out.println("!You don't have bank account\nNote:please assign values to create an
account");
    else
        {
            System.out.println("Name of the Depositor: "+nameDepositor);
            System.out.println("Balance amount in the account:"+balanceAmount);
        }
}
public void getInput()
{
    System.out.println("How can i help you?");
    System.out.println("1. Open account");
    System.out.println("2. Deposit amount");
    System.out.println("3. Withdraw amount");
    System.out.println("4.Account details");
}

```

```

System.out.println("5.Exit");
System.out.print("Please choose from above(Eg.2):");
    }
}
class MainBank
{
public static void main(String[] s) throws IOException
    {
        System.out.println(":::::::::WELCOME TO INDIAN BANK:::::::::");
        Bank newAccount=new Bank();
        try(Scanner scan=new Scanner(System.in))
        {
            int continueState=0;

            while(continueState==0)
                {
                    newAccount.getInput();
                    int currentProcess=scan.nextInt();

                    if(currentProcess==1)
                    {
                        System.out.print("Enter your name:");
                        String nameDepositor=scan.next();
                        System.out.print("Enter your account type:");
                        String accType=scan.next();
                        System.out.print("Enter your opening balance:");
                        double balanceAmount=scan.nextDouble();
                        newAccount.assignValues(nameDepositor,accType,balanceAmount);
                    }
                    else if(currentProcess==2)
                    {
                        System.out.print("Enter amount to deposit: ");
                        newAccount.depositAmount(scan.nextDouble());
                    }
                    delse if(currentProcess==3)
                    {
                        System.out.print("Enter amount to withdraw: ");
                        newAccount.withdrawAmount(scan.nextDouble());
                    }
                    else if(currentProcess==4)

```

```

{
    newAccount.displayDetails();
}
else if(currentProcess==5)
    {
continueState=1;
System.out.println("THANK YOU");
    }

System.out.print("press Otocontinue...");
continueState=scan.nextInt();
    }
}
}
}
}

```

OUTPUT:-

::::::::::WELCOME TO INDIAN BANK::::::::::

How can i help you?

1. Open account
2. Deposit amount
3. Withdraw amount
- 4.Account details
- 5.Exit

Please choose from above(Eg.2): 1

Enter your name:Ramesh

Enter your account type:Savings

Enter your opening balance:2000

Your new account number is:583467

press Otocontinue...0

How can i help you?

1. Open account
2. Deposit amount
3. Withdraw amount
- 4.Account details
- 5.Exit

Please choose from above(Eg.2): 2

Enter amount to deposit: 1000

Amount deposited successfully.

press Otocontinue...0

How can i help you?

1. Open account
2. Deposit amount
3. Withdraw amount
- 4.Account details
- 5.Exit

Please choose from above(Eg.2):3

Enter amount to withdraw: 500

Amount debited successfully.

press 0tocontinue...0

How can i help you?

1. Open account
2. Deposit amount
3. Withdraw amount
- 4.Account details
- 5.Exit

Please choose from above(Eg.2):4

Name of the Depositor: Ramesh

Balance amount in the
account:2500.0

press 0tocontinue...0

How can i help you?

1. Open account
2. Deposit amount
3. Withdraw amount
- 4.Account details
- 5.Exit

Please choose from above(Eg.2):5

THANK YOU

press 0tocontinue...

Experiment15:-

Given are two one-dimensional arrays, A and B which are sorted in ascending order. Write a program to merge them into a single sorted array C that contains every item from arrays A and B, in ascending order.

SourceCode:

```
import java.util.Arrays;
class MergeArray
{
private static int []mergeArray(int []arrayA,int []arrayB)
{
int []mergedArray=new int[arrayA.length+arrayB.length];

int i=0,j=0,k=0;
while(i<arrayA.length&& j<arrayB.length)
{
if(arrayA[i]<arrayB[j])
{
mergedArray[k] = arrayA[i];
i++;
k++;
}
else
{
mergedArray[k] = arrayB[j];
j++;
k++;
}
}
while(i<arrayA.length)
{
mergedArray[k] = arrayA[i];
i++;
k++;
}
while(j<arrayB.length)
{
mergedArray[k] = arrayB[j];
j++;
}
```

```
k++;  
    }  
    return mergedArray;  
    }  
  
public static void main(String []args)  
    {  
int []arrayA =new int[] {-7, 12, 17,29, 41,56, 79};  
  
int []arrayB=new int[]{-9,-3,0,5, 19};  
  
int[] mergedArray = mergeArray(arrayA, arrayB);  
  
System.out.println("ArrayA:"+Arrays.toString(arrayA));  
  
System.out.println("ArrayB:"+Arrays.toString(arrayB));  
  
System.out.println("MergedArray:"+Arrays.toString(mergedArray));  
    }  
}
```

OUTPUT:-

ArrayA: [-7, 12, 17, 29,41, 56, 79]

ArrayB: [-9, -3,0, 5, 19]

MergedArray: [-9, -7, -3, 0, 5, 12, 17, 19, 29, 41, 56,79]

Experiment16:-

Write a java program implementing multiple inheritance.

SourceCode:

```
interface MyRestaurant
{
void eat(){
System.out.println("I am eating this food");

}
interface MyJourney
{
void travel();
}
class Holiday implements MyRestaurant, MyJourney
{
public void eat(){
System.out.println("I am trying this food");
}
public void travel()
{
System.out.println("I am trying this route");
}

}
class MyTrip{
public static void main(String args[])
{
Holiday myschedule=new Holiday();
myschedule.eat();
myschedule.travel();
}
}
```

OUTPUT:-

I am trying this food
I am trying this route

Experiment17:-

Write a java program implementing package.

SourceCode:

```
package data;
public class Demo
{
    public void show()
    {
        System.out.println("Hi Everyone");
    }
    public void view()
    {
        System.out.println("Hello");
    }
}
import data.*;
class Package {
    public static void main(String arg[])
    {
        Demo d = new Demo();
        d.show();
        d.view();
    }
}
```

OUTPUT:-

```
Hi Everyone
Hello
```

Experiment 18:-

Write a java program to read a file line by line and print the line on the output screen.

SourceCode:

```
import java.io.File;
import java.util.Scanner;
class FileRead {
public static void main(String[] args)
{
try{
    File file=new File("input.txt");
    Scanner sc=new Scanner(file);
    System.out.println("Reading File Using Scanner:");
    while(sc.hasNextLine())
    {
        System.out.println(sc.nextLine());
    }
    sc.close();
}
catch(Exception e)
{
    e.printStackTrace();
}
}
```

OUTPUT:-

ReadingFileUsingScanner:

First Line
Second Line
Third Line
Fourth Line
Fifth Line

Experiment 19:-

Write a java program to read content from one file and write it into another file.

SourceCode:

```
import java.io.File;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;

public class CopyFile
{

public static void main(String[] rgs)
{try{
    File sourceFile=new File("input.txt");
    File destinationFile=new File("output.txt");

FileInputStream inputStream = new FileInputStream(sourceFile);
FileOutputStream outputStream=new FileOutputStream(destinationFile);
byte[] buffer = new byte[8192];
int bytesRead;
while ((bytesRead = inputStream.read(buffer)) != -1) {
outputStream.write(buffer,0, bytesRead);
    }
inputStream.close();
outputStream.close();
System.out.println("The file has been copied successfully.");
    }
catch(IOException e)
{
System.out.println("An error occurred while copying the file.");
e.printStackTrace();
    }
}
}
```

OUTPUT:-

The file has been copied successfully.

Experiment20:-

Define an exception called “No Match Exception” that is thrown when a string is not equal to “India”. Write a program that uses this exception.

SourceCode:

```
import java.util.Scanner;

public class NoMatchException extends Exception
{

public static void main(String[] args)
{
Scanner scanner=new Scanner(System.in);

    System.out.print("Enter a string: ");
    String input=scanner.nextLine();

    try{
    if(input.equalsIgnoreCase("India"))
    {
    System.out.println("The string is equal to 'India'.");
    }
    else {
    throw new NoMatchException();
    }
    }
    catch (NoMatchException e)
    {
    System.out.println("No Match Exception Caught");
    }
    }
}
```

OUTPUT:-

```
Enter a string:India
The string is equal to 'India'
Enter a string:Bharat
No Match Exception Caught.
```

Experiment21:

Develop a java project for percentage calculator tool.

SourceCode:

```
import java.util.Scanner;

public class PercentageCalculator
{
    public static void main(String[]args)
    {
        Scanner scanner=new Scanner(System.in);

        System.out.print("Enter the total value:");
        double total =scanner.nextDouble();

        System.out.print("Enter the percentage: ");
        double percentage=scanner.nextDouble();

        double result=calculatePercentage(total,percentage);
        System.out.println("Result:"+result +"%");

        scanner.close();
    }

    private static double calculatePercentage(double total,double percentage)
    {
        return (percentage/100)* total;
    }
}
```

OUTPUT:

```
Enter the total value:200
Enter the percentage: 25
Result:50.0%
```

Develop a java project for temperature conversion tool.

```
import java.util.Scanner;

public class TemperatureConverter
{
public static void main(String []args)
{
    Scanner scanner=new Scanner(System.in);

    System.out.print("Enter temperature in Celsius:");
    double celsius = scanner.nextDouble();

    double fahrenheit = convertCelsiusToFahrenheit(celsius);
    System.out.println("Temperature in Fahrenheit:"+fahrenheit+ "°F");

    scanner.close();
}

Private static double convertCelsiusToFahrenheit(double celsius)
{
return (celsius * 9/5) +32;
}
}
```

OUTPUT:

Enter temperature in Celsius: 30

Temperaturein Fahrenheit:86.0°F