Practical 1

Aim: Setup Java programming environment and implement following program.

“Write a Java Program to display "Hello PPSU".”

```
public class hello
{
        public static void main(String[]args)
        {
        System.out.println("Hello PPSU");
        }
}
```

```
D:\A>javac hello.java

D:\A>java hello
Hello PPSU
```

Practical 2

Aim: Write a Java Program to,

Note: Take all Values from User,

1) Define variables of all datatypes in java and display their values.
2) Find area of the circle,square and rectangle.
3) Find Simple interest. **SI = P × R × T**, where P = Principal, R = Rate of Interest, and T= Time period.
4) Swap 2 numbers.
5) Convert Celsius toFahrenheit.

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

          int radius = 0;
          int length = 0;
          int breadth = 0;
          int areaofcircle = 0;
          int areaofsquare = 0;
          int areaofrectangle = 0;

          System.out.println("Enter the radius : ");
          radius = sc.nextInt();

        areaofcircle = ((22/7)*radius*radius);
        System.out.println("area of circle : " +areaofcircle);

          System.out.println("Enter the length & breadth :");
          length = sc.nextInt();
          breadth = sc.nextInt();

        areaofrectangle = (length*breadth);
        System.out.println("area of rectangle : " +areaofrectangle);

          System.out.println("Enter the length:");
          length = sc.nextInt();

        areaofsquare = (length*length);
        System.out.println("area of square : " +areaofsquare);
        }
}
```

```
D:\A>javac area.java

D:\A>java area
Enter the radius :
15
area of circle : 675
Enter the length & breadth :
10
20
area of rectangle : 200
Enter the length:
10
area of square : 100
```

```
 public class datatypes
{
        public static void main(String[]args)
        {
                int x;
                x=1;
                System.out.println("x=" +x);

                short y;
                y=3452;
                System.out.println("y=" +y);

                long z;
                z=3442;
                System.out.println("z=" +z);

                float i;
                i=1.23f;
                System.out.println("i=" +i);

                String j;
                j="hello";
                System.out.println("j=" +j);

                double a;
                a=34.31152;
                System.out.println("a=" +a);

                boolean b;
                b=true;
                System.out.println("b=" +b);

                byte c;
                c=34;
                System.out.println("c=" +c);

                char grade;
                grade='A';
                System.out.println("grade=" +grade);
        }
}
```

```
D:\A>javac datatypes.java

D:\A>java datatypes
x=1
y=3452
z=3442
i=1.23
j=hello
a=34.31152
b=true
c=34
grade=A
```

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

          double principal = 0;
          double rate = 0;
          double time = 0;
          double simpleInterest = 0;

    System.out.print("Enter the Principal amount : ");
    principal = input.nextDouble();

    System.out.print("Enter the Rate : ");
    rate = input.nextDouble();

    System.out.print("Enter the Time : ");
    time = input.nextDouble();

    simpleInterest = (principal * rate * time) / 100;

    System.out.println("");
    System.out.println("The Simple Interest is : " + simpleInterest);

  }

}
```

```
D:\A>javac simpleintrest.java

D:\A>java simpleintrest
Enter the Principal amount : 1500
Enter the Rate : 2
Enter the Time : 6

The Simple Interest is : 180.0
```

```
public class cf
{
        public static void main(String[]args)
        {
                int c,f;
                c=100;
                f=((c*9)/5)+35;
                System.out.println("temperature is " +f+ " in fahrenheit.");
        }
}
```

```
D:\A>javac cf.java

D:\A>java cf
temperature is 215 in fahrenheit.
```

```
public class swapnos
{
        public static void main(String[] args)
        {
                int a=20, b=30, c;
                c=a;
                a=b;
                b=c;
                System.out.println(a+" is swaped value of a and this is swaped value of b "+b);
        }
}
```

```
D:\A>javac swapnos.java

D:\A>java swapnos
30 is swaped value of a and this is swaped value of b 20
```

Practical 3

1) Find the given number is even or odd.
2) Find the given number is positive or negative.
3) Create a marksheet using 6 subject marks and print grade, percentage of a student.

4) Find that the given character is vowel or consonant.
5) Find out largest number out of 3 numbers without using logical operator.

```
import java.util.Scanner;

public class oddeven
{
        public static void main(String[] args)
        {
                int num;
                System.out.println("Enter the number: ");

                Scanner sc=new Scanner(System.in);
                num = sc.nextInt();

                if(num%2==0)
                System.out.println("Entered number is even");
                else
                System.out.println("Entered number is odd");
        }
}
```

```
D:\21SE02ML006_OOPJ>javac oddeven.java

D:\21SE02ML006_OOPJ>java oddeven
Enter the number:
3
Entered number is odd
```

```java
import java.util.Scanner;

public class pone
{
	public static void main(String[] args)
	{
		int num;
		System.out.println("Enter the number: ");

		Scanner sc=new Scanner(System.in);
		num = sc.nextInt();

		if(num>0)
		System.out.println("Entered number is positive");
		else if(num<0)
		System.out.println("Entered number is negative");
		else
		System.out.println("Entered number is 0");
	}
}
```

```
D:\21SE02ML006_OOPJ>javac pone.java

D:\21SE02ML006_OOPJ>java pone
Enter the number:
0
Entered number is 0

D:\21SE02ML006_OOPJ>javac pone.java

D:\21SE02ML006_OOPJ>java pone
Enter the number:
11
Entered number is positive

D:\21SE02ML006_OOPJ>javac pone.java

D:\21SE02ML006_OOPJ>java pone
Enter the number:
-11
Entered number is negative
```

```java
import java.util.Scanner;

public class q4
{
  public static void main(String[] args)
  {
    char ch;
    Scanner scan = new Scanner(System.in);

    System.out.print("Enter an Alphabet: ");
    ch = scan.next().charAt(0);

    if(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' ||
      ch=='A' || ch=='E' || ch=='I' || ch=='O' || ch=='U')
      System.out.println("\nIt is a Vowel.");
    else
      System.out.println("\nIt is a Consonant.");
  }
}
```

```
D:\21SE02ML006_OOPJ>javac q4.java

D:\21SE02ML006_OOPJ>java q4
Enter an Alphabet: a

It is a Vowel.

D:\21SE02ML006_OOPJ>javac q4.java

D:\21SE02ML006_OOPJ>java q4
Enter an Alphabet: y

It is a Consonant.
```

```
import java.util.Scanner;
public class q5
{
public static void main(String[] args)
        {
        int a, b, c, largest, temp;

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter the first number:");
        a = sc.nextInt();

        System.out.println("Enter the second number:");
        b = sc.nextInt();

        System.out.println("Enter the third number:");
        c = sc.nextInt();

        temp=a>b?a:b;
        largest=c>temp?c:temp;
        System.out.println("The largest number is: "+largest);
        }
}
```

```
D:\21SE02ML006_OOPJ>javac q5.java

D:\21SE02ML006_OOPJ>java q5
Enter the first number:
11
Enter the second number:
12
Enter the third number:
13
The largest number is: 13
```

```
import java.util.Scanner;
public class q3
{
public static void main(String[] args)
		{
		Scanner sc= new Scanner(System.in);
		System.out.print("Enter english marks:");
		int a= sc.nextInt();

		System.out.print("Enter maths marks: ");
		int b= sc.nextInt();

		System.out.print("Enter social science marks: ");
		int c= sc.nextInt();

		System.out.print("Enter physics marks: ");
		int d= sc.nextInt();

		System.out.print("Enter biology marks:");
		int e= sc.nextInt();

		System.out.print("Enter chemistry marks: ");
		int f= sc.nextInt();

		int total = a+b+c+d+e+f;
		float sum = total/6;

		if(total>=550)
		{
			System.out.println("Grade : A+");
		}
		else if(total<549)
		{
			System.out.println("Grade : B+");
		}
		else if(total<400)
		{
			System.out.println("Grade: C+");
		}
		else
		{
			System.out.println("Grade : F");
		}

			System.out.print("The percentage :" + sum +"%");
		}
}
```

```
D:\21SE02ML006_OOPJ>javac q3.java

D:\21SE02ML006_OOPJ>java q3
Enter english marks:99
Enter maths marks: 99
Enter social science marks: 99
Enter physics marks: 99
Enter biology marks:99
Enter chemistry marks: 99
Grade : A+
The percentage :99.0%
```

Practical 4

1) Create class and object of this class.
2) Create multiple object of a class and print values of reference variable.
3) Create multiple class and print value of reference variable using an object.
4) Use final key word.

```
public class test
{
int x=50;
public static void main(String[]args)
        {
        test t1=new test();
        System.out.println("t1.x="+t1.x);
        }
}
```

```
D:\21SE02ML006_OOPJ>javac test.java

D:\21SE02ML006_OOPJ>java test
t1.x=50
```

```
public class test1
{
int x=50;
public static void main(String[]args)
 {
 test t2=new test();
 t2.x=90;
 System.out.println("t2.x="+t2.x);
 }
}
```

```
D:\21SE02ML006_OOPJ>javac test1.java

D:\21SE02ML006_OOPJ>java test1
t2.x=90
```

first - Notepad

File Edit Format View Help

```
public class first
{
        int x=10;
}
```

second - Notepad

File Edit Format View Help

```
public class second
{
  public static void main(String []args)
        {
        first f1= new first();
        System.out.println("Value of x in class first="+ f1.x);
        }
}
```

```
D:\21SE02ML006_OOPJ>javac second.java

D:\21SE02ML006_OOPJ>java second
Value of x in class first=10
```

```
public class test
{
int x;
final x=10;
public static void main(String[]args)
 {
 test t1=new test();
 System.out.println("t1.x="+t1.x);
 }
}
```

```
D:\21SE02ML006_OOPJ>javac test.java
test.java:4: error: <identifier> expected
final x=10;
      ^
1 error
```

Practical 5

1) Find out factorial number with using,
i) Loop
ii) Function
2) Print Fibonacci Series using,
i) Loop
ii) Function
3) Check the given number is prime number or not.
4) Check given number is palindrome or not.

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

        Scanner sc=new Scanner(System.in);

        System.out.println("Enter the number: ");
        int num=sc.nextInt();
        int i=1,fact=1;
        while(i<=num)
        {
            fact=fact*i;
            i++;
        }
        System.out.println("Factorial of the number: "+fact);
     }
}
```

```
E:\21SE02ML006_OOPJ>javac factorial.java

E:\21SE02ML006_OOPJ>java factorial
Enter the number:
5
Factorial of the number: 120
```

```java
import java.util.Scanner;
public class fact
{
        public static void main(String[] args)
        {
          Scanner sc =new Scanner(System.in);
          int n;
          System.out.println("Enter n=");
          n=sc.nextInt();
          fact(n);
        }
          static void fact(int n)
        {
                int i,f=1;
                for(i=1;i<=n;i++)
                 {
                  f=f*i;
                 }
                 System.out.println("factorial of n = " +f);
         }
}
```

```
D:\21SE02ML006_OOPJ>javac fact.java

D:\21SE02ML006_OOPJ>java fact
Enter n=
5
factorial of n = 120
```

```java
import java.util.Scanner;
public class fibonacci
 {

    public static void main(String[] args)
        {

        Scanner sc=new Scanner(System.in);
        int t1 = 0, t2 = 1;
        System.out.print("Enter the number of terms: ");
        int n=sc.nextInt();
        System.out.println("First " + n + " terms of fibonnaci series: ");

        for (int i = 1; i <= n; ++i)
        {
            System.out.print(t1 + " ");
            int sum = t1 + t2;
            t1 = t2;
            t2 = sum;
    }
}
}
```

```
E:\21SE02ML006_OOPJ>javac fibonacci.java

E:\21SE02ML006_OOPJ>java fibonacci
Enter the number of terms: 5
First 5 terms of fibonnaci series:
0 1 1 2 3
```

```
import java.util.Scanner;
public class fibo
{
        public static int fibonacciRecursion(int n)
        {
        if(n == 0)
                {
                return 0;
                }
        if(n == 1 || n == 2)
                        {
                        return 1;
                        }
        return fibonacciRecursion(n-2) + fibonacciRecursion(n-1);
        }
         public static void main(String args[])
        {
         int maxNumber ;
         System.out.println("Enter a number to show that many fibonacci numbers: ");
         Scanner sc=new Scanner(System.in);
         int n = sc.nextInt();

         System.out.println("Fibonacci Series of "+n+" numbers: ");
         for(int i = 0; i <n; i++)
                {
                        System.out.print(fibonacciRecursion(i) +" ");
                }
        }
}
```

```
D:\21SE02ML006_OOPJ>javac fibo.java

D:\21SE02ML006_OOPJ>java fibo
Enter a number to show that many fibonacci numbers:
5
Fibonacci Series of 5 numbers:
0 1 1 2 3
```

```java
import java.util.Scanner;

public class prime
{

   public static void main(String[] args)
 {
       Scanner sc = new Scanner(System.in);
       System.out.print("Enter a number : ");
       int n = sc.nextInt();
       if (isPrime(n))
        {
           System.out.println(n + " is a prime number");
        }
         else
        {
           System.out.println(n + " is not a prime number");
        }
 }

   public static boolean isPrime(int n)
 {
       if (n <= 1)
        {
           return false;
         }
       for (int i = 2; i < Math.sqrt(n); i++)
       {
           if (n % i == 0)
           {
               return false;
           }
       }
       return true;
  }
}
```

```
D:\21SE02ML006_OOPJ>javac prime.java

D:\21SE02ML006_OOPJ>java prime
Enter a number : 10
10 is not a prime number

D:\21SE02ML006_OOPJ>java prime
Enter a number : 1
1 is not a prime number

D:\21SE02ML006_OOPJ>java prime
Enter a number : 2
2 is a prime number

D:\21SE02ML006_OOPJ>java prime
Enter a number : 0
0 is not a prime number
```

```
import java.util.Scanner;
public class palindromeno
 {

    public static void main(String args[])
    {
         Scanner in = new Scanner(System.in);
     System.out.print("Input a number: ");
     int n = in.nextInt();
     int sum = 0, r;
         int temp = n;
     while(n>0)
           {
        r = n % 10;
        sum = (sum*10)+r;
        n = n/10;
       }
      if(temp==sum)
        System.out.println("It is a Palindrome number.");
      else
        System.out.println("Not a palindrome");
     }
}
```

```
E:\21SE02ML006_OOPJ>javac palindromeno.java

E:\21SE02ML006_OOPJ>java palindromeno
Input a number: 121
It is a Palindrome number.
```

Practical 6

1) Make one Method name Calculator(int a, int b), and call this method from main method.
2) Perform Method Overloading using, Make 3 method with the same name called int Area(int r), int Area(int l, int h), int Area(int r, int b).

```
import java.util.Scanner;

public class cal
{

     public static void main(String[] args)
     {

        Scanner sc = new Scanner(System.in);

        System.out.println("Calculator\n");

        System.out.println("1.Addition");
        System.out.println("2.Subtraction");
        System.out.println("3.Division");
        System.out.println("4.Multiplication");

        System.out.print("\n Select one from above(Enter its number):");
        int i = sc.nextInt();
        System.out.println();


        switch(i)
        {
           case 1:
        addition();
        break;
         case 2:
        subtraction();
        break;
         case 3:
        division();
        break;
         case 4:
        multiplication();
        break;
```

```
     default:
    System.out.println("Value not identified. Enter number only from above");
    break;
   }

}

public static void addition(){

    int n1, n2;

    System.out.println("Addition");

    Scanner sc = new Scanner(System.in);

    System.out.print("\nFirst Number: ");
    n1 = sc.nextInt();

    System.out.print("\nSecond Number: ");
    n2 = sc.nextInt();


    System.out.println("\nSum: " + n1 + " + " + n2 + " = " + (n1 + n2));
}

public static void subtraction(){
    int n1, n2;

    System.out.println("Subtraction");

    Scanner sc = new Scanner(System.in);
```

```
        System.out.print("\nFirst Number: ");
        n1 = sc.nextInt();

        System.out.print("\nSecond Number: ");
        n2 = sc.nextInt();


        System.out.println("\nSum: " + n1 + " - " + n2 + " = " + (n1 - n2));
    }

    public static void division(){
        int n1, n2;


        System.out.println("Division");

        Scanner sc = new Scanner(System.in);

        System.out.print("\nFirst Number: ");
        n1 = sc.nextInt();

        System.out.print("\nSecond Number: ");
        n2 = sc.nextInt();

        System.out.println("\nSum: " + n1 + " / " + n2 + " = " + (n1 / n2));
    }

    public static void multiplication(){
        int n1, n2;


        System.out.println("Multiplication");

        Scanner sc = new Scanner(System.in);


         System.out.print("\nFirst Number: ");
         n1 = sc.nextInt();

         System.out.print("\nSecond Number: ");
         n2 = sc.nextInt();

         System.out.println("\nSum: " + n1 + " x " + n2 + " = " + (n1 * n2));
     }
}
```

```
E:\21SE02ML006_OOPJ>javac cal.java

E:\21SE02ML006_OOPJ>java cal
Calculator

1.Addition
2.Subtraction
3.Division
4.Multiplication

 Select one from above(Enter its number):3

Division

First Number: 45

Second Number: 5

Sum: 45 / 5 = 9
```

```
import java.util.Scanner;
class area
{
        void area(int r)
        {
        System.out.println("Area of circle = " + 3.14*r*r);
        }
        void area(int a,int b)
        {
        System.out.println("Area of Rectangle = " + a*b);
        }
        void area(float c)
        {
        System.out.println("Area of Square = " + c*c);
        }
}
 class calculator
{
        public static void main(String []arg)
        {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter radius for circle");
        int r = sc.nextInt();

        System.out.println("Enter length");
        int a = sc.nextInt();

        System.out.println("Enter breadth");
        int b = sc.nextInt();

        System.out.println("Enter side");
        int c = sc.nextInt();
        area ac = new area();
        ac.area(r);
        ac.area(a,b);
        ac.area(c);
        }
}
```

```
E:\21SE02ML006_OOPJ>javac calculator.java

E:\21SE02ML006_OOPJ>java calculator
Enter radius
10
Enter length
10
Enter breadth
10
Enter side
10
Area of circle = 314.0
Area of Rectangle = 100
Area of circle = 314.0
```

Practical 7

1.) Create a class Car that has model no, name, color & cost as data member and create
void getCarDetails() and void showCardDetails() as member function. Read details
for 3 cars and display it. Do not use static methods.

2. Create a class student that has rollno, name, marks[5] as data member and void
getinfo(), void putinfo() and float calCPI() as member function. If student have
marks less than 35 in any subjects then he is failed otherwise calculate CPI. Also
display student's details.

3. Create a class BankAccount that has depositor name,acc_no, acc_type, balance as
data members and void createAcc(), void deposit(), void withdraw() and void
balanceInquiry() as member function. When a new account is created assign next
serial no as account number. Account number starts from 1.

4. Define a class Salary with the Name, Basic salary and dearness allowance as data

members. Calculate and print the Name, Basic salary(yearly), dearness allowance
and tax deduced at source(TDS) and net salary, where TDS is charged on gross
salary which is basic salary + dearness allowance and TDS rate is as per following
table.
Gross Salary TDS
Rs. 100000 and below NIL
Above Rs. 100000 10% on excess over 100000
DA is 74% of Basic Salary for all
Use appropriate member function.
5. Create a class Complex to represent a complex number. Class has one default
constructor and one parameterized constructor with two arguments and add
function to add two complex numbers which will take object of the class as an
argument and return object of the class as a result. When a complex number object
is printed, it should display the complex number in proper format. The output
should be displayed as follows:- Sum of a1+b1i & a2+b2i is : a3+b3i (Passing objects
to methods.)

car - Notepad

File Edit Format View Help

```
import java.util.Scanner;

public class car
{

    int car_model_no;
    String car_name;
    String car_color;
    int car_cost;


    public void getCarDetails(){
       Scanner sc=new Scanner(System.in);

       System.out.println("Car model number:");
       car_model_no= sc.nextInt();
       System.out.println("Car name:");
       sc.nextLine();
       car_name = sc.nextLine();
       System.out.println("Car color:");
       car_color= sc.nextLine();
       System.out.println("Car cost:");
       car_cost= sc.nextInt();

    }

    public void showCarDetails(){
        System.out.println(" ");
        System.out.println("....Car Details....");
        System.out.println("Car model number:" + car_model_no);
        System.out.println("Car name:" + car_name);
        System.out.println("Car color:" + car_color);
        System.out.println("Car cost:" + car_cost);
        System.out.println(" ");
    }
    public static void main(String[] args)
    {


        car c1 = new car();
        c1.getCarDetails();

        car c2 = new car();
        c2.getCarDetails();

        car c3 = new car();
        c3.getCarDetails();

        c1.showCarDetails();
        c2.showCarDetails();
        c3.showCarDetails();
    }

}
```

```
D:\21SE02ML006_OOPJ>java car
Car model number:
1
Car name:
Maruti
Car color:
Red
Car cost:
500000
Car model number:
2
Car name:
Suzuki
Car color:
Grey
Car cost:
600000
Car model number:
3
Car name:
Kia
Car color:
Blue
Car cost:
700000

....Car Details....
Car model number:1
Car name:Maruti
Car color:Red
Car cost:500000


....Car Details....
Car model number:2
Car name:Suzuki
Car color:Grey
Car cost:600000


....Car Details....
Car model number:3
Car name:Kia
Car color:Blue
Car cost:700000
```

```
import java.util.Scanner;
public class Salary
{
        String Name;
        int basicSalary;
        float dearAll;
   float gs;
   float tax;
   float netSalary;
    public void name()
    {

        System.out.println(Name);
    }

    public void basic_salary()
    {
        System.out.println(basicSalary);
    }

    public void dearness_allowance()
    {
      dearAll=(basicSalary/100)*74;
    }
    public float gross_salary()
    {

        gs=basicSalary+dearAll;
        return gs;
    }
    public float Tax_deduction_salary()
    {
        tax = (gs/100)*10;
        return tax;
    }
```

```
    public float net_salary()
    {
       netSalary= gs-tax;
       return netSalary;
    }

        public static void main(String[] args)
        {
        Scanner sc=new Scanner(System.in);
        Salary p1=new Salary();
        float tds=0,gross_S;

                System.out.println("Enter your Name:");
                p1.Name=sc.nextLine();
                System.out.println("Enter your Baisc salary:");
                p1.basicSalary=sc.nextInt();
                p1.dearness_allowance();
                gross_S=p1.gross_salary();
                if(gross_S>100000)
                {
                        tds=p1.Tax_deduction_salary();
                }
                else
          {
                System.out.println("Your gross salary is less than 100000. Thus no TDS is applied.");

          }
          System.out.println("-----------Calculation-------------------");
        System.out.println("Your name is "+p1.Name);
        System.out.println("Your basic Salary is "+p1.basicSalary);
        System.out.println("Your dearness Allowance is "+p1.dearAll);
        System.out.println("Your gross Salary is "+gross_S);
        System.out.println("Your TDS is "+tds);
        System.out.println("Your net salary is "+p1.net_salary());

        }
}
```

```
D:\other gave me>java Salary
Enter your Name:
jooly
Enter your Basic salary:
30000
Your gross salary is less than 100000. Thus no TDS is applied.
-----------Calculation-------------------
Your name is jooly
Your basic Salary is 30000
Your dearness Allowance is 22200.0
Your gross Salary is 52200.0
Your TDS is 0.0
Your net salary is 52200.0
```

```
import java.util.Scanner;

public class BankAccount
{
Scanner sc = new Scanner(System.in);

        String depositer_name;
        int acc_no=1;
        String acc_type;
        int balance;

 void createAcc(){
        System.out.println("Creating new account:-");
        System.out.println("Name:");
        depositer_name =sc.nextLine();
        System.out.println("Choose your Account type:");
        acc_type=sc.nextLine();
        System.out.println("your account number is " +acc_no);
        acc_no++;
        System.out.println("Enter initial deposit:");
        balance=sc.nextInt();
        }

 void deposit(){
         int deposit=0;
          System.out.println("....Deposit Process....");
       System.out.println("Enter the Deposit money");

       deposit=sc.nextInt();
       balance=balance+deposit;
        }
```

```
Sum = 7.8 + 9.6i
```

```
public class Complex
{
    double real;
    double imag;

    public Complex(double real, double imag)
   {
        this.real = real;
        this.imag = imag;
    }

    public static void main(String[] args)
    {
        Complex n1 = new Complex(4.3, 4.55),
                n2 = new Complex(3.5, 5.10),
                temp;

        temp = add(n1, n2);

        System.out.printf("Sum = %.1f + %.1fi", temp.real, temp.imag);
    }

    public static Complex add(Complex n1, Complex n2)
    {
        Complex temp = new Complex(0.0, 0.0);

        temp.real = n1.real + n2.real;
        temp.imag = n1.imag + n2.imag;

        return(temp);
    }
}
```

```
 void withdraw(){
       System.out.println("....Withdraw Process....");
       float withdraw=0;
       System.out.println("Enter the Withdraw money");
        }

 void balance_inquiry(){
        System.out.println("Your Current Balance is:: "+balance);
        }


 public static void main(String[] args)
        {
          System.out.println("Enter your Name:");
          BankAccount p1 = new BankAccount();
          p1.createAcc();
          p1.deposit();
        }
}
```

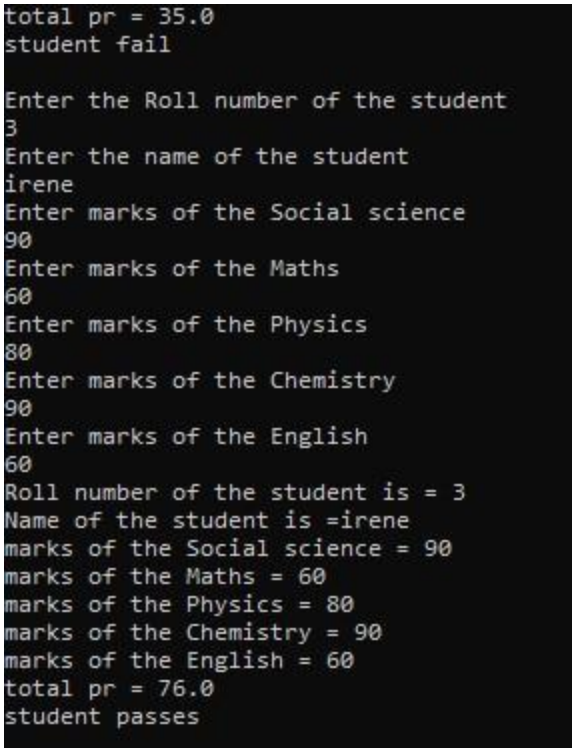
```
D:\21SE02ML006_OOPJ>java BankAccount
Enter your Name:
Creating new account:-
Name:
joolly
Choose your Account type:
saving
your account number is 1
Enter initial deposit:
20000
....Deposit Process....
Enter the Deposit money
20000
```

```
import java.util.Scanner;
public class student
{
        int rollno;
        String name;
        int marks1,marks2,marks3,marks4,marks5;
        float calpr;
        public void getstudentDetails()
        {
          Scanner scan = new Scanner(System.in);
          System.out.println("\nEnter the Roll number of the student");
          rollno= scan.nextInt();
          System.out.println("Enter the name of the student");
          name = scan.nextLine();
          name = scan.nextLine();
          System.out.println("Enter marks of the Social science");
          marks1= scan.nextInt();
          System.out.println("Enter marks of the Maths");
          marks2= scan.nextInt();
          System.out.println("Enter marks of the Physics");
          marks3= scan.nextInt();
          System.out.println("Enter marks of the Chemistry");
          marks4= scan.nextInt();
          System.out.println("Enter marks of the English");
          marks5= scan.nextInt();

          calpr=((marks1+marks2+marks3+marks4+marks5)/5);
         }
```

```
  calpr=((marks1+marks2+marks3+marks4+marks5)/5);
 }
public void showstudentDetails()
{
  Scanner scan = new Scanner(System.in);
  System.out.println("Roll number of the student is = " +rollno);
  System.out.println("Name of the student is =" + name);
  System.out.println("marks of the Social science = " + marks1);
  System.out.println("marks of the Maths = " + marks2);
  System.out.println("marks of the Physics = " + marks3);
  System.out.println("marks of the Chemistry = " + marks4);
  System.out.println("marks of the English = " + marks5);
  System.out.println("total pr = "+calpr);
  if(calpr>35)
{
        System.out.println("student passes");
}
else
{
        System.out.println("student fail");
}
}
public static void main(String[] args)
{
        System.out.println(".....................");
  student s1 = new student();
  s1.getstudentDetails();
  s1.showstudentDetails();

  student s2 = new student();
  s2.getstudentDetails();
  s2.showstudentDetails();
```

```
        public static void main(String[] args)
        {
                System.out.println(".....................");
          student s1 = new student();
          s1.getstudentDetails();
          s1.showstudentDetails();

          student s2 = new student();
          s2.getstudentDetails();
          s2.showstudentDetails();

          student s3 = new student();
          s3.getstudentDetails();
          s3.showstudentDetails();
        }
}
```

```
....................

Enter the Roll number of the student
1
Enter the name of the student
jolly
Enter marks of the Social science
90
Enter marks of the Maths
90
Enter marks of the Physics
990
Enter marks of the Chemistry
90
Enter marks of the English
90
Roll number of the student is = 1
Name of the student is =jolly
marks of the Social science = 90
marks of the Maths = 90
marks of the Physics = 990
marks of the Chemistry = 90
marks of the English = 90
total pr = 270.0
student passes

Enter the Roll number of the student
2
Enter the name of the student
rwee
Enter marks of the Social science
56
Enter marks of the Maths
62
Enter marks of the Physics
33
Enter marks of the Chemistry
15
Enter marks of the English
13
```



Practical 8

1.) Using Inner class concept make a calculator.

2.) Take two class (i.e inner class and outer class), Bank and Accounts... Bank is outer class and Accounts is Inner class.. using this create an Account .

```
import java.util.*;
class input {
   void inputm() {
      Scanner sc = new Scanner(System.in);
      System.out.println("Enter a number: ");
      int n = sc.nextInt();
      System.out.println("Enter a number: ");
      int m = sc.nextInt();

      class output {
         void cal() {
            int sum= m+n;
            int mul= m*n;
             System.out.println("Sum = " + sum);
             System.out.println("Multiplication =  " + mul);
         }
      }
      output y = new output();
      y.cal();
   }
}
class calculator {
   public static void main(String[] args) {
      input x=new input();
      x.inputm();
   }
}
```

innerClass2 - Notepad

File Edit Format View Help

```
class bank {
   void bankInfo() {
      int x = 98;
      System.out.println("Name of bank: XYZ");
      class account {
         void accountInfo() {
            System.out.println("Name of account holder: JSK");
            System.out.println("Age of account holder: 17");
            System.out.println("Contact number of account holder: 98xxxxxxxx");

         }
      }
      account y = new account();
      y.accountInfo();
   }
}
class innerClass2 {
   public static void main(String[] args) {
      bank x=new bank();
      x.bankInfo();
   }
}
```

```
import java.util.*;
class input {
   void inputm() {
      Scanner sc = new Scanner(System.in);
      System.out.println("Enter a number: ");
      int n = sc.nextInt();
      System.out.println("Enter a number: ");
      int m = sc.nextInt();

      class output {
         void cal() {
            int sum= m+n;
            int mul= m*n;
             System.out.println("Sum = " + sum);
             System.out.println("Multiplication =  " + mul);
         }
      }
      output y = new output();
      y.cal();
   }
}
class calculator {
   public static void main(String[] args) {
      input x=new input();
      x.inputm();
   }
}
```

```
C:\Users\JSK\Desktop\4\p8>javac innerClass2.java

C:\Users\JSK\Desktop\4\p8>java innerClass2
Name of bank: XYZ
Name of account holder: JSK
Age of account holder: 17
Contact number of account holder: 98xxxxxxxx
```

Practical 9

1.) Consider an example of declaring the examination result. Design three classes: Student,) Exam, and Result. The Student class has data members such as that representing roll number, name etc. Create the class Exam by inheriting the Student class. The Exam class adds fields representing the marks scored in six subjects. Derive

the Result from the Exam class and it has its own fields such as total_Marks. Write an interactive program to model this relationship.

2.) Create class named 'Member' having the following members:
----> Name
----> Age

----> Phone Number

----> Address

----> Salary

It also has a method name 'PrintSalary' which prints the salary of the members.
for this you need to create two classes 'Employee' and 'Manager', inherits the 'Member' class. The 'Employee' and 'Manager' classes have data members 'Specialization' and 'Department' respectively. Now Assign Name, Age, Phone Number, Address and Salary to an Employee and a Manager by making an object of both these classes and print the same along with specialization and department respectively.

result - Notepad

File Edit Format View Help

```
class student
{
        static int rol_no = 1;
        static String name="JSK";
        static int Class=12;
}

class exam extends student
{
        static int english=10;
        static int maths=10;
        static int music=10;
        static int hindi=10;
        static int art=10;
        static int science=10;
}

class result extends exam
{
        public static void main (String [] args)
                {
                        int total=maths+english+music+art+science+hindi;
                        float avg=total/6;
                        float ptg=avg*10;

                        exam obj=new exam();
                        System.out.println("total marks:" +total);
                        System.out.println("percentage:" +ptg);
                }
}
```

```
C:\Users\JSK\Desktop\4\p9>javac result.java

C:\Users\JSK\Desktop\4\p9>java result
total marks:60
percentage:100.0
```

manager - Notepad

File Edit Format View Help

```
class member
{
        static int sr_no=1;
        static String name="ACB";
        static int age=20;
        static String Ph_no= "9xxxxxxxxx";
        static String address ="xyz recidency";
        static int salary =100000;

        public static void printSalary()
        {
                System.out.println("Print salary:100000");
        }
}

class employee extends member
{
        String specialization ="Machine Learning";
}

class manager extends member
{
        public static void main(String[]args)
        {
                employee obj = new employee();
                System.out.println("Name:" +name);
                System.out.println("Age:" +age);
                System.out.println("Contact:" +Ph_no);
                System.out.println("Adress:" +address);
                System.out.println("Salary:" +salary);
                printSalary();
        }
}
```

```
C:\Users\JSK\Desktop\4\p9>javac manager.java

C:\Users\JSK\Desktop\4\p9>java manager
Name:ACB
Age:20
Contact:9xxxxxxxxx
Adress:xyz recidency
Salary:100000
Print salary:100000
```

Practical 10

1.) Write a Java Program to calculate length of the string taken from user without using any inbuilt function.

2.) Use all inbuilt function of String. Here the string will be taken from an user.

3.) Write a Java Program to check the given string from user is palindrome or not.

4.) Take on String from user. and find out the number of vowels present in string and also print those vowels present in string.

```
import java.util.*;
class manager
{
  public static void main(String args[])
  {
    String original, reverse = "";
    Scanner in = new Scanner(System.in);
    System.out.println("Enter a string/number to check if it is a palindrome");
    original = in.nextLine();
    int length = original.length();
    for ( int i = length - 1; i >= 0; i-- )
      reverse = reverse + original.charAt(i);
    if (original.equals(reverse))
      System.out.println("Entered string/number is a palindrome.");
    else
      System.out.println("Entered string/number isn't a palindrome.");
  }
}
```

```
C:\Users\lenovo\Desktop\programming>javac manager.java

C:\Users\lenovo\Desktop\programming>java manager
Enter a string/number to check if it is a palindrome
2992
Entered string/number is a palindrome.
```

managerr - Notepad

File Edit Format View Help

```
import java.util.*;

class managerr
{
        public static void main(String args[])
        {
                int i=0;
                String str;
                Scanner sc =new Scanner(System.in);
                System.out.println("Enter the string");
                str=sc.nextLine();
                char ch[]=str.toCharArray();

        for(char c :ch)
        {
                i++;
        }
                System.out.println("Length of the string=" +i);
        }
}
```

```
C:\Users\JSK\Desktop\4\p10>javac managerr.java

C:\Users\JSK\Desktop\4\p10>java managerr
Enter the string
jothsna
Length of the string=8
```

```java
import java.util.*;
class in_no
{
 Scanner sc = new Scanner(System.in);
{System.out.println("Enter first number :");}
int a = sc.nextInt();
{System.out.println("Enter secound number :");}
int b = sc.nextInt();
{System.out.println("Enter third number :");}
int c = sc.nextInt();

}
class calculate extends in_no
   {
int sum = a + b + c;
int multiply = a*b*c;
   }
public class manager
{
  public static void main(String args[])
  {
    calculate p = new calculate();
System.out.println("The sum is : " +p.sum);
  System.out.println("The multiplication is : " +p.multiply);
   }
}
```

```
C:\Users\lenovo\Desktop\programming>javac manager.java

C:\Users\lenovo\Desktop\programming>java manager
Enter first number :
23
Enter secound number :
34
Enter third number :
20
The sum is : 77
The multiplication is : 15640
```

```
class bank
{
    void bankinfo()
    {
    int x=99;
    System.out.println("Name of the bank:icicii");
    class account
{
    void accountinfo()
 {
        System.out.println("Name of the account holder:abc");
        System.out.println("Age of the Account holder:18");
        System.out.println("Contact number of account holder: 7xxxxxxxxx");
    }
}
account y = new account();
y.accountinfo();
}
}
class ban
{
    public static void main(String[] args)
    {
    bank x =new bank();
    x.bankinfo();
    }
}
```

```
C:\Users\JSK\Desktop\4\p10>javac ban.java

C:\Users\JSK\Desktop\4\p10>java ban
Name of the bank:icicii
Name of the account holder:abc
Age of the Account holder:18
Contact number of account holder: 7xxxxxxxxx
```

Practical 11

5.) Create a class named 'Shape' with a method to print "This is This is shape". Then create
two other classes named 'Rectangle', 'Circle' inheriting the Shape class, both having a
method to print "This is rectangular shape" and "This is circular shape" respectively.

Create a subclass 'Square' of 'Rectangle' having a method to print "Square is a
rectangle". Now call the method of 'Shape' and 'Rectangle' class by the object of 'Square'
Class.

```
class shape
{
	void sq()
	{
		System.out.println("This is shape");
	}
}

class rectangle extends shape
{

	class square
	{
		void sq()
		{
			System.out.println("square is a rectangle");
		}
	}

	square obj1 = new square();
	{obj1.sq();}
	{super.sq();}

	void r()
	{
		System.out.println("This is rectangle shape");
	}
}

class circle extends shape
{
	void c()
	{
		System.out.println("This is circular shape");
	}
}

class manager
{
	public static void main(String []arg)
	{
		circle obj = new circle();
		obj.c();
		rectangle obj2 = new rectangle();
```

```
C:\Users\lenovo\Desktop\programming>javac manager.java

C:\Users\lenovo\Desktop\programming>java manager
This is circular shape
square is a rectangle
This is shape
This is shape
```

Practical 12

1.) Make a package Calculator with class Calc and take method Calc1 over there and then import package to your main file and perform some operations and take an outout.

2.) Make package Factorial and use it at other class.

3.) Make Package for student result and import it at different main class.

fact - Notepad

File Edit Format View Help

```
package Factorial;

public class fact {
    public int factorial(int a){
        int fac =1;
        for(int i =a ;i>0; i--)
        {
            if(i==0)
            {
                break;
            }
            else{
                fac = fac*i;
            }
        }
        return fac;
    }
    public static void main(String[] args) {

    }
}
```

*factorial - Notepad

File Edit Format View Help

```
import java.util.Scanner;

import Factorial.fact;
public class factorial {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        fact f= new fact();
        System.out.print("Enter one num : ");
        int a =  input.nextInt();
        System.out.println("Factorial : " + f.factorial(a));
    }
}
s
```

```
Enter one num : 5
Factorial : 120
```

```
import java.util.Scanner;

import Result.res;

public class Result {
    public static void main(String[] args) {
        System.out.println("Enter a Numerical Grade");

            Scanner sc = new Scanner(System.in);
        int a = sc.nextInt();
        res r = new res();

        System.out.println("Converted Grade : " + r.grade(a));
    }
}
```

```
package Result;

public class res {
    public char grade(int score)
    {
        char userGrade = 'F';
        if(score >= 88)
            userGrade = 'A';
        else if(score >= 80)
            userGrade = 'B';
        else if (score >= 67)
            userGrade = 'C';
        else if (score >= 60)
            userGrade = 'D';

        return userGrade;

    }
    public static void main(String[] args) {

    }
}
```

```
Enter a Numerical Grade
80
Converted Grade : B
```

```java
import java.util.Scanner;

public class Calc{
    public int Calc1(char op, int a , int b)
    {
        switch(op)
        {
            case '+':
                return a+b;
            case '-':
                return a-b;
            case '/':
                return a/b;
            case '*':
                return a*b;
            default :
                return 0;
        }
    }
    public static void main(String[] args) {


        Calc c = new Calc();
        Scanner input = new Scanner(System.in);
        System.out.print("Enter two num : ");
        int a = input.nextInt();
        int b = input.nextInt();
        System.out.print("Enter one of the following : +,-,/,* : ");
        char op = input.next().charAt(0);
        System.out.println(c.Calc1(op,a,b));
}
}
```

```
C:\Users\JSK\Desktop\4\P12>javac Calc.java

C:\Users\JSK\Desktop\4\P12>java Calc
Enter two num : 2 4
Enter one of the following : +,-,/,* : +
6
```

Practical 13

WAP to show partial implementation of an interface.

```
interface AnimalEat {
  void eat();
}
interface AnimalTravel {
  void travel();
}
class Animal implements AnimalEat, AnimalTravel {
  public void eat() {
    System.out.println("Animal is eating");
  }
  public void travel() {
    System.out.println("Animal is travelling");
  }
}
public class manager {
  public static void main(String args[]) {
    Animal a = new Animal();
    a.eat();
    a.travel();
  }
}
```

```
C:\Users\lenovo\Desktop\programming>javac manager.java

C:\Users\lenovo\Desktop\programming>java manager
Animal is eating
Animal is travelling
```

Practical 14

Design a class Prime to fill an array of order [m x n] with the first [m x n] prime
numbers Row wise. The details of the members of the class are given below:

Class name : Prime

Data members / instance variables:

arr[ ][ ] : Two dimensional integer array.

r : integer to store the number of rows.

c : integer to store the number of columns.

Member functions:

prime( ) : to accept the size of the array.

int isprime (int p) : return 1 if number is prim and 0 if not prime.

void fill ( ) : to fill the elements of the array with the first (m x n) prime numbers.

void display ( ) : displays the array in a matrix form.
Specify the class Prime giving details of the constructor and member functions int is
prime (int), void fill( ) and void display( ) with main( ) function to create an object and call
the function accordingly.

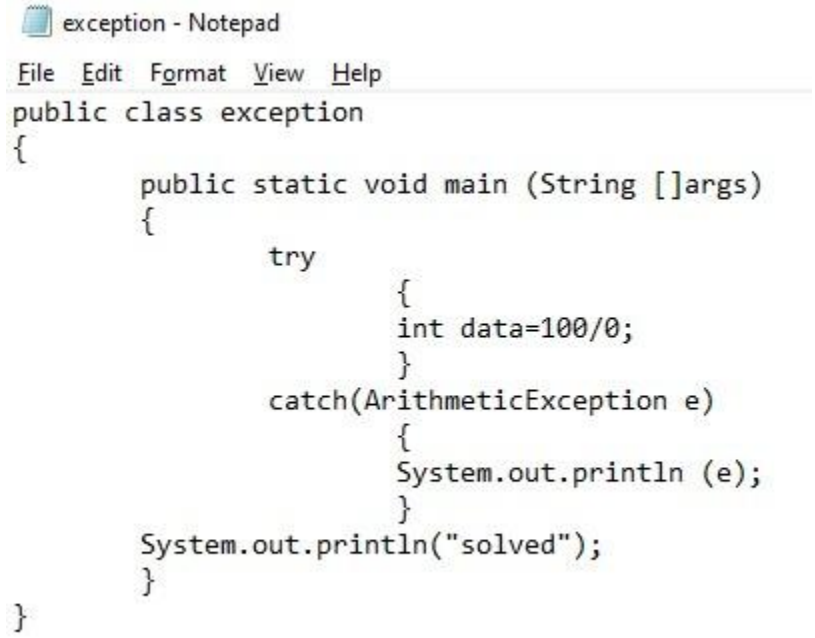
```
import java.util.Scanner;
 public class prime {

  boolean isPrime(int num)
  {
     int counter = 0;
     for (int i = 1; i <= num; i++)
     {
        if (num % i == 0)
           counter = counter + 1;
     }

     if (counter == 2)
        return true;
     else
        return false;
  }

  public static void main(String args[])
  {

     prime mwp
        = new prime();

     int row = 4;
     int col = 4;

     int Matrix[][] = new int[row][col];
     int res = row * col;
     int Result[] = new int[res];

     int i = 0, j;
     int k = 1;
```

```
        while (i < res)
        {
            if (mwp.isPrime(k) == true)
            {
                Result[i] = k;
                i++;
            }
            k++;
        }
        int x = 0;
        for (i = 0; i < row; i++)
        {
            for (j = 0; j < col; j++)
            {
                Matrix[i][j] = Result[x];
                x++;
            }
        }

        System.out.println("The Resultant Matrix is : ");

        for (i = 0; i < row; i++)
        {
            for (j = 0; j < col; j++)
            {
                System.out.print(Matrix[i][j] + " ");
            }
            System.out.println();
        }
    }

}
```

```
C:\Users\lenovo\Desktop\programming>javac manager.java

C:\Users\lenovo\Desktop\programming>java manager
The Resultant Matrix is :
2 3 5 7
11 13 17 19
23 29 31 37
41 43 47 53
```

Practical 15

Complete all 5 exception handling methods using try and catch.



```
import java.util.Scanner;
class ex2
{
public static void main(String args[])
{
try
{
try
{
System.out.println("going to divide");
int b;
}
catch(ArithmeticException e)
{
System.out.println(e);
}
try
{
int a[]=new int[5];
a[5]=4;
}
catch(ArrayIndexOutOfBoundsException e)
{
 System.out.println(e);
}
System.out.println("other statement");
}
catch(Exception e)
{
System.out.println("handled");
}
System.out.println("other statement");
}
}
```

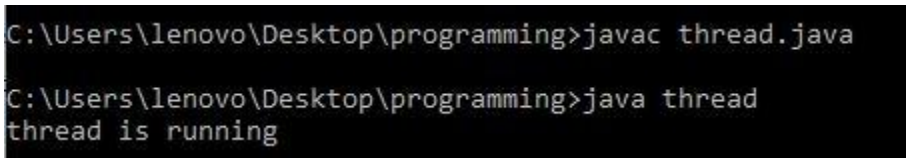
```
C:\Users\JSK\Desktop\4\p15>javac exception.java

C:\Users\JSK\Desktop\4\p15>java exception
java.lang.ArithmeticException: / by zero
solved
```

```
C:\Users\lenovo\Desktop\programming>javac manager.java

C:\Users\lenovo\Desktop\programming>java manager
going to divide
java.lang.ArrayIndexOutOfBoundsException: Index 5 out of bounds for length 5
other statement
other statement
```

Implement Thread using,
1.) Using Extended Thread Class
2.) Interface.

```
class thread extends Thread
{
        public void run()
        {
                System.out.println("thread is running");
        }

        public static void main(String []arg)
        {
                thread t2 = new thread();
                t2.start();
        }
}

class thread implements Runnable
{
        public void run()
        {
                System.out.println("thread is running");
        }

        public static void main(String []arg)
        {
                thread t2 = new thread();
                Thread t1 = new Thread(t2);
                t1.start();
        }
}
```

```
C:\Users\lenovo\Desktop\programming>javac thread.java

C:\Users\lenovo\Desktop\programming>java thread
thread is running
```



x

Did not include applet and java project