

Program:

1) import java.io.*;

```
abstract class Shape{
abstract public void calc_area();
abstract public void calc_volume();
final float pi=3.14f;
}
```

```
    class Sphere extends Shape{
double r;
    private double area;
    private double volume;
    public void accept() throws IOException{
        System.out.println("Enter the radius of the Sphere: ");
        BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
        r=Double.parseDouble(br.readLine());
    }
    public void calc_area(){
        area=pi*r*r;
    }
    public void calc_volume(){

        volume=1.3333333334*pi*r*r*r;
    }
    public void display(){
        calc_area();
        calc_volume();
        System.out.println("The area of sphere is: "+area);
        System.out.println("The volume of sphere is: "+volume);
    }
}
```

```
    class Cone extends Shape{
double h,r,area,volume;

    public void accept() throws IOException{
        System.out.println("Enter radius and height of the Cone: ");
        BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
        r=Double.parseDouble(br.readLine());
        h=Double.parseDouble(br.readLine());
    }
    public void calc_area(){

        double sq=h*h+r*r;
        area=pi*r*(r+java.lang.Math.sqrt(sq));
    }
    public void calc_volume(){
        double d=h/3;
        volume=pi*r*r*d;
    }
    public void display(){
        calc_area();
        calc_volume();
        System.out.println("The area of Cone is: "+area);
        System.out.println("The volume of Cone is: "+volume);
    }
}
```

```

    }

    class Cylinder extends Shape{
        double r,h,area,volume;
        public void accept() throws IOException{
            System.out.println("Enter radius and height of the Cylinder: ");
            BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
            r=Double.parseDouble(br.readLine());
            h=Double.parseDouble(br.readLine());
        }
        public void calc_area(){
            area=(2*pi*r*h)+(2*pi*r*r);
        }
        public void calc_volume(){
            volume=pi*r*r*h;
        }
        public void display(){
            calc_area();
            calc_volume();
            System.out.println("The area of Cylinder is: "+area);
            System.out.println("The volume of Cylinder is: "+volume);
        }
    }

    class Box extends Shape{
        double l,b,h,area,volume;
        public void accept() throws IOException{
            System.out.println("Enter length, breadth and height of the Box: ");
            BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
            l=Double.parseDouble(br.readLine());
            b=Double.parseDouble(br.readLine());
            h=Double.parseDouble(br.readLine());
        }
        public void calc_area(){
            area=(2*l*b)+(2*b*h)+(2*l*h);
        }
        public void calc_volume(){
            volume=l*b*h;
        }
        public void display(){
            calc_area();
            calc_volume();
            System.out.println("The area of Box is: "+area);
            System.out.println("The volume of Box is: "+volume);
        }
    }

    public class sa2 {
        public static void main(String [] args)throws IOException{
            Sphere s=new Sphere();
            s.accept();
            s.display();
            Cone co=new Cone();
            co.accept();
            co.display();
            Cylinder cy=new Cylinder();
            cy.accept();
        }
    }

```

```

        cy.display();
        Box b=new Box();
        b.accept();
        b.display();
    }
}

```

2. package series;

```

public class Prime {
    int flag;
    public void prime(int n){
        for(int i=2;i<n;i++){
            if(n%i==0)
            {
                flag=0;
                break;
            }
            else
            flag=1;
        }
        if(flag==1)
        System.out.println(n+" is a prime number.");
        else System.out.println(n+" is not a prime number.");
    }
    public void fibonacci(int n){
        int first=0, second=1, c, next;
        System.out.println("Fibonacci Series:");
        for(int i=0;i<=n;i++){
            {
                if(i<=1)
                next=i;
                else
                {
                    next=first+second;
                    first=second;
                    second=next;
                }
            }
            System.out.println(next);
        }
    }
    public void square(int n){
        System.out.println("Square of the number is "+(n*n));
    }
}

```

Main File:

```

import series.*;
import java.io.*;
public class SeriesMain {
    public static void main(String [] args)throws IOException{
        Prime p=new Prime();
        int i;
        BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
        do
        {
            System.out.println("Enter a number / 0 to exit");

```

```

        i=Integer.parseInt(br.readLine());
        p.prime(i);
        p.fibonacci(i);
        p.square(i);
    }
    while(i>0);
}
}

```

3. interface Shape

```

{
void input();
void area();
}
class Circle implements Shape
{
int r = 0;
double pi = 3.14, ar = 0;
@Override
    public void input()
    {
r = 5;
}
@Override
    public void area()
    {
ar = pi * r * r;
System.out.println("Area of circle:"+ar);
}
}
class Rectangle extends Circle
{
int l = 0, b = 0;
double ar;
public void input()
{
super.input();
l = 6;
b = 4;
}
public void area()
{
super.area();
ar = l * b;
System.out.println("Area of rectangle:"+ar);
}
}
public class Demo
{
public static void main(String[] args)
{
    Rectangle obj = new Rectangle();
obj.input();
obj.area();
}
}

```

```

4. import java.io.*;
class AgeNotWithInRangeException extends Exception
{
    public String toString()
    {
        return("Age is not between 15 and 21 ... Please ReEnter the Age");
    }
}
class NameNotValidException extends Exception
{
    public String validname()
    {
        return("Name is not Valid ... Please ReEnter the Name");
    }
}
class Student
{
    int roll,age;
    String name,course;
    Student()
    {
        roll=0;
        name=null;
        age=0;
        course=null;
    }
    Student(int r,String n,int a,String c)
    {
        roll=r;
        course=c;
        int l,temp=0;
        l=n.length();
        for(int i=0;i<l;i++)
        {
            char ch;
            ch=n.charAt(i);
            if(ch<'A' || ch>'Z' && ch<'a' || ch>'z')
                temp=1;
        }
        /*-----Checking Name-----*/
        try
        {
            if(temp==1)
                throw new NameNotValidException();
            else
                name=n;
        }
        catch(NameNotValidException e2)
        {
            System.out.println(e2);
        }
        /*-----Checking Age-----*/
        try
        {
            if(a>=15 && a<=21)

```

```

        age=a;
        else
        throw new AgeNotWithInRangeException();
    }
    catch(AgeNotWithInRangeException e1)
    {
        System.out.println(e1);
    }
}
void display()
{
    System.out.println("roll Name Age Course");
    System.out.println("-----");
    System.out.println(roll+" "+name+" "+age+" "+course);
}
}

```

```

class StudentDemo
{
    public static void main(String args[])throws IOException
    {

```

```

        BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
        int r,a;
        String n,c;

```

```

        System.out.println("Enter roll,name,age,course");

```

```

        r=Integer.parseInt(br.readLine());
        n=br.readLine();
        a=Integer.parseInt(br.readLine());
        c=br.readLine();
        Student s=new Student(r,n,a,c);
        s.display();
    }

```

```

}

```

```

    5. import java.io.*;
    import java.sql.*;

```

```

class GFG {
    public static void main(String[] args) throws Exception
    {
        String url
        = "jdbc:mysql://localhost:3306/table_name"; // table details
        String username = "rootgfg"; // MySQL credentials
        String password = "gfg123";
        String query
        = "select *from students"; // query to be run
        Class.forName(
        "com.mysql.cj.jdbc.Driver"); // Driver name
        Connection con = DriverManager.getConnection(

```

```

url, username, password);
System.out.println(
"Connection Established successfully");
Statement st = con.createStatement();
ResultSet rs
= st.executeQuery(query); // Execute query
rs.next();
String name
= rs.getString("name"); // Retrieve name from db

System.out.println(name); // Print result on console
st.close(); // close statement
con.close(); // close connection
System.out.println("Connection Closed....");
}
}

```

6.

```

import java .io.*;
class InvalidDateException extends Exception
{
}
class MyDate
{
    int day,mon,yr;

    void accept(int d,int m,int y)
    {
        day=d;
        mon=m;
        yr=y;
    }
    void display()
    {
        System.out.println("Date is valid : "+day+"/"+mon+"/"+yr);
    }
}

class DateMain
{

    public static void main(String arg[]) throws Exception

    {
        System.out.println("Enter Date : dd mm yyyy ");
        BufferedReader br = new BufferedReader(new
        InputStreamReader(System.in));
        int day=Integer.parseInt(br.readLine());
        int mon=Integer.parseInt(br.readLine());

        int yr=Integer.parseInt(br.readLine());

        int flag=0;
    }
}

```

```

try
{
    if(mon<=0 || mon>12)

        throw new InvalidDateException();

    else

        {
            if(mon==1 || mon==3 || mon==5 || mon==7 || mon==8 ||
mon==10 || mon==12)
            {

                if(day>=1 && day <=31)

                    flag=1;
                else
                    throw new InvalidDateException();
            }
            else if (mon==2)
            {
                if(yr%4==0)
                {
                    if(day>=1 && day<=29)
                        flag=1;
                    else throw new InvalidDateException();
                }
                else
                {
                    if(day>=1 && day<=28)
                        flag=1;
                    else throw new InvalidDateException();
                }
            }
            else
            {
                if(mon==4 || mon == 6 || mon== 9 || mon==11)
                {
                    if(day>=1 && day <=30)
                        flag=1;
                    else throw new InvalidDateException();
                }
            }
        }
    if(flag== 1)
    {
        MyDate dt = new MyDate();
        dt.accept(day,mon,yr);
        dt.display();
    }
}
catch (InvalidDateException mm)
{
    System.out.println("Invalid Date");
} }

```



```
7. public class MyNumber
{
    private int x;
    public MyNumber()
        {x=0;}
    public MyNumber(int x)
        {this.x=x;}
    public boolean isNegative()
    {
        if (x<0)
            return true;
        else return false;
    }
    public boolean isPositive()
    {
        if (x>0)
            return true;
        else return false;
    }
}
```

```
public boolean isZero()
```

```
{
```

```
    if (x==0)
```

```
        return true;
        else return false;
    }
```

```
public boolean isEven()
```

```
{
```

```
    if (x%2==0)
```

```
        return true;
```

```
        else return false;
    }
```

```
public boolean isOdd()
```

```
{
```

```
    if (x%2!=0)
```

```
        return true;
```

```
        else return false;
```

```
    }
```

```

public static void main(String[] args) throws ArrayIndexOutOfBoundsException

    {int x=Integer.parseInt(args[0]);
      MyNumber m=new MyNumber();

      if(m.isNegative())
        System.out.println("number is negative");

      if(m.isPositive())

        System.out.println("number is positive");

      if(m.isZero())

        System.out.println("number is zero");

      if(m.isEven())

        System.out.println("number is even");

      if(m.isOdd())

        System.out.println("number is odd");

    }

}

```

```

8. import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
import java.lang.Exception;

class CreateLoginForm extends JFrame implements ActionListener
{
    //initialize button, panel, label, and text field
    JButton b1;
    JPanel newPanel;
    JLabel userLabel, passLabel;
    final JTextField textField1, textField2;

    //calling constructor
    CreateLoginForm()

```

```

{

    userLabel = new JLabel();
    userLabel.setText("Username");    //set label value for textField1

    //create text field to get username from the user
    textField1 = new JTextField(15);    //set length of the text

    //create label for password
    passLabel = new JLabel();
    passLabel.setText("Password");    //set label value for textField2

    //create text field to get password from the user
    textField2 = new JPasswordField(15);    //set length for the password

    //create submit button
    b1 = new JButton("SUBMIT"); //set label to button

    //create panel to put form elements
    newPanel = new JPanel(new GridLayout(3, 1));
    newPanel.add(userLabel);    //set username label to panel
    newPanel.add(textField1);    //set text field to panel
    newPanel.add(passLabel);    //set password label to panel
        newPanel.add(textField2);    //set text field to panel
    newPanel.add(b1);    //set button to panel

    //set border to panel
    add(newPanel, BorderLayout.CENTER);

    //perform action on button click
    b1.addActionListener(this);    //add action listener to button
    setTitle("LOGIN FORM");    //set title to the login form
}

//define abstract method actionPerformed() which will be called on button click
public void actionPerformed(ActionEvent ae)    //pass action listener as a paramet
er

```

```

    {
        String userValue = textField1.getText();    //get user entered username from t
he textField1
        String passValue = textField2.getText();    //get user entered password from th
e textField2

        //check whether the credentials are authentic or not
        if (userValue.equals("test1@gmail.com") && passValue.equals("test")) { //if auth
entic, navigate user to a new page

            //create instance of the NewPage
            NewPage page = new NewPage();

            //make page visible to the user
            page.setVisible(true);

            //create a welcome label and set it to the new page
            JLabel wel_label = new JLabel("Welcome: "+userValue);
            page.getContentPane().add(wel_label);
        }
        else{
            //show error message
            System.out.println("Please enter valid username and password");
        }
    }
}

//create the main class
class LoginFormDemo
{
    //main() method start
    public static void main(String arg[])
    {
        try
        {
            //create instance of the CreateLoginForm
            CreateLoginForm form = new CreateLoginForm();

```

```

        form.setSize(300,100); //set size of the frame
        form.setVisible(true); //
make form visible to the user
    }
    catch(Exception e)
    {
        //handle exception
        JOptionPane.showMessageDialog(null, e.getMessage());
    }
}
}

```

NewPage.java

```

//import required classes and packages
import javax.swing.*;
import java.awt.*;

//create NewPage class to create a new page on which user will navigate
class NewPage extends JFrame
{
    //constructor
    NewPage()
    {
        setDefaultCloseOperation(javax.swing.
WindowConstants.DISPOSE_ON_CLOSE);
        setTitle("Welcome");
        setSize(400, 200);    }
}

```

```

9. import java.io.*;
class Ass2SetBQ2
{
    private int id;
    private double salary;
    private String name,dept;
    double total;
    double sal=salary;
    public Employee()
    {
        id=0;
        salary=0.0;
        name="";
        dept="";
    }
}

```

```

}
public Employee(int id,double salary,String name,String dept)
{
this.id=id;
this.salary=salary;
this.name=name;
this.dept=dept;
}
public void accept() throws IOException
{
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
System.out.println("enter id of employee");
id=Integer.parseInt(br.readLine());
System.out.println("enter salary of employee:");
salary=Double.parseDouble(br.readLine());
System.out.println("enter the department of employee:");
dept=br.readLine();
}
public double total(){
total=total+salary;
return total;
}
public void display()
{
System.out.println("Emp ID:"+id);
System.out.println("name:"+name);
System.out.println("Salary:"+salary);
System.out.println("Department:"+dept);
}
}
class Manager extends Employee{
private double bonus;
public void accept() throws IOException
{
super.accept();
System.out.println("enter the bonus of the empolyee:");
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
bonus=Double.parseDouble(br.readLine());
super.total=bonus;
}
public void display(){
super.display();
System.out.println("Bonus:"+bonus);
System.out.println("Total Salary:"+salary);
}
}
public class sal
{
public static void main(String[]args) throws IOException{
Manager[] m=new Manager[10];
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
System.out.println("Enter the number of employee:");
int n=Integer.parseInt(br.readLine());
for(int i=0;i<n;i++)
{
m[i]=new Manager();
m[i].accept();
m[i].total();
}
}
}

```

```

    }
    for(int i=0;i<n;i++)
    {
        m[i].display();
        System.out.println("_____");
    }
    double src=m[0].total;
    int temp=0;
    for(int i=1;i<n;i++)
    {
        if(src<m[i].total)
        {
            src=m[i].total;
            temp=i;
        }
    }
    System.out.println("The employee having the maximum total salary is:");
    m[temp].display();
}
}

```

```

10.      interface Shape
{
double area();
}
class Circle implements Shape
{
    double radius;
    Circle(double radius)
    {
        this.radius=radius;
    }
    public double area()
    {
        return java.lang.Math.PI *radius*radius;
    }
}
class Cylinder extends Circle
{
double height;
Cylinder(double radius,double height)
{
    super(radius);
    this.height=height;
}
    public double area() //overriding
    {
        return java.lang.Math.PI *radius*radius*height;
    }
}
public class Ass2SetBQ1
{
public static void main(String[]args)
{
    Shape s;
    s=new Circle(6);
}
}

```

```

        System.out.println("AREA OF CIRCLE =" + s.area());
        s = new Cylinder(6, 12);
        System.out.println("AREA OF CYLINDER =" + s.area());
    }
}

```

```

11.      import Series.Prime;
import Series.Square;
import Series.Fibonacci;
import java.io.*;
class Ass2SetAQ2
{
    public static void main(String args[]) throws IOException
    {
        BufferedReader br = new BufferedReader(new
InputStreamReader(System.in));
        System.out.println("Enter no : ");
        int no = Integer.parseInt(br.readLine());

        Prime p = new Prime();
        System.out.println("PRIME numbers upto this no. are: ");
        p.prime_range(no);

        Square s = new Square();
        System.out.println("SQUARE of numbers upto this no. are: ");
        s.square_range(no);

        Fibonacci f = new Fibonacci();
        System.out.println("FIBONACCI SERIES upto this no. are: ");
        f.printFibonacci(no);
    }
}

```

```

12.      import java.util.*;
class InvalidNameException extends Exception
{
}
class Ass3SetBQ2
{
    public static void main(String args[])
    {
        Scanner s = new Scanner(System.in);
        System.out.println("enter the doctor name");
        String name = s.next();
        try
        {
            for(int i=0; i< name.length(); i++)
            {
                int ch = (int)name.charAt(i);
                if((ch>=65 && ch<=90) || (ch>=97 && ch<=122))
                {
                }
                else
                {
                    throw new InvalidNameException();
                }
            }
        }
    }
}

```



```

5    System.out.println("doctor name is :"+name);
    }
    catch(InvalidNameException e)
    {
        System.out.println("INVALID NAME");
    }
}
}

```

```

13.      import java.io.*;
class InvalidDateException extends Exception
{
}
class MyDate
{
    int day,mon,yr;
    void accept(int d,int m,int y)
    {
        day=d;
        mon=m;
        yr=y;
    }
    void display()
    {
        System.out.println("date is valid : "+day+"/"+mon+"/"+yr);
    }
}

class Ass3SetCQ2
{
    public static void main(String arg[])throws Exception
    {
        System.out.println("Enter Date : dd mm yyyy ");
        BufferedReader br = new BufferedReader(new
InputStreamReader(System.in));

        int day=Integer.parseInt(br.readLine());
        int mon=Integer.parseInt(br.readLine());
        int yr=Integer.parseInt(br.readLine());
        int flag=0;

        try
        {
            if(mon<=0 || mon>12)
                throw new InvalidDateException();

            else
            {
                if(mon==1 || mon==3 || mon==5 || mon==7 || mon==8 || mon==10 ||
mon==12)
                {
                    if(day>=1 && day <=31)
                        flag=1;
                    else
                        throw new InvalidDateException();
                }
            }
        }
    }
}

```

```

else if (mon==2)
{
    if(yr%4==0)
    {
        if(day>=1 && day<=29)
            flag=1;

        else
            throw new InvalidDateException();
    }

else
{
    if(day>=1 && day<=28)
        flag=1;

    else
        throw new InvalidDateException();
}
}
else
{
    if(mon==4 || mon == 6 || mon== 9 || mon==11)
    {
        if (day>=1 && day <=30)
            flag=1;

        else
            throw new InvalidDateException();
    }
}
}
if(flag== 1)
{
    MyDate dt = new MyDate();
    dt.accept(day,mon,yr);
    dt.display();
}
}
catch (InvalidDateException mm)
{
    System.out.println("INVALID DATE");
}
}
}

```