

PROGRAM 1-QUADRATIC EQUATION

```
import java.util.Scanner;
public class QuadraticEquation
{
    public static void main(String[] Strings)
    {
        Scanner input = new Scanner(System.in);
        System.out.println("Enter the value of a: ");
        double a = input.nextDouble();
        System.out.println("Enter the value of b: ");
        double b = input.nextDouble();
        System.out.println("Enter the value of c: ");
        double c = input.nextDouble();
        double d = b * b - 4.0 * a * c;
        if (d > 0.0)
        {
            double r1 = (-b + Math.pow(d, 0.5)) / (2.0 * a);
            double r2 = (-b - Math.pow(d, 0.5)) / (2.0 * a);
            System.out.println("The roots are " + r1 + " and " + r2);
        }
        else if (d == 0.0)
        {
            double r1 = -b / (2.0 * a);
            System.out.println("The root is " + r1);
        }
        else
        {
            double r1 = -b / (2.0 * a);
            double r2 = -b / (2.0 * a);
            double imaginary = Math.pow(-d, 0.5) / (2.0 * a);
            System.out.println("Roots are r1=" + r1 + "+" + imaginary + "i and r2=" + r1 - imaginary + "i");
        }
    }
}
```

PROGRAM 2- STUDENT INFORMATION

```
import java.io.*;
class Student
{
    String usn, name, branch;
    long ph;

    Student()
    {
        usn = name = branch = "no value";
        ph = 0;
    }

    void read_data(String u, String n, String b, long p)
    {
        usn = u;
        name = n;
        branch = b;
        ph = p;
    }

    void display()
    {
        System.out.println(usn + "\t" + name + "\t" + branch + "\t\t" + ph);
    }
}

class Lab1A
{
    public static void main(String args[]) throws Exception
    {
        String u, n, b;
        long p;
        int no;
        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
        System.out.println("Enter number of records");
        no = Integer.parseInt(br.readLine());

        Student[] s = new Student[no];

        for(int i=0; i<s.length;i++)
        {
```

```
System.out.println("Enter " + (i + 1) + " Student record");
s[i] = new Student();
System.out.println("Enter student USN");
u = br.readLine();
System.out.println("Enter student Name");
n = br.readLine();
System.out.println("Enter student Branch");
b = br.readLine();
System.out.println("Enter student Phone number");
p = Long.parseLong(br.readLine());
s[i].read_data(u, n, b, p);
}

System.out.println("USN \t\t NAME \t BRANCH \t PHONE NO");
for(int i=0; i<s.length;i++)
{
s[i].display();
}
}
}
```

PROGRAM 3- PRIME NUMBER AND ARITHMETIC CALCULATOR

PROGRAM 3A

```
import java.util.Scanner;
public class CheckPrime
{
    public static void main(String[] args)
    {
        int num, i, count=0;
        Scanner s = new Scanner(System.in);
        System.out.print("Enter a Number: ");
        num = s.nextInt();
        for(i=2; i<num; i++)
        {
            if(num%i == 0)
            {
                count++;
                break;
            }
        }
    }
}
```

```
if(count==0)
    System.out.println("\nIt is a Prime Number.");
else
    System.out.println("\nIt is not a Prime Number.");
}
```

PROGRAM 3B

```
import java.util.Scanner;
public class ArithmeticCalculator {
    public static void main(String[] args) {
        double num1, num2;
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter first number:");
        num1 = scanner.nextDouble();
        System.out.print("Enter second number:");
        num2 = scanner.nextDouble();
        System.out.print("Enter an operator (+, -, *, /): ");
        char operator = scanner.next().charAt(0);
        scanner.close();
        double output;
        switch(operator)
        {
            case '+':
                output = num1 + num2;
                break;

            case '-':
                output = num1 - num2;
                break;

            case '*':
                output = num1 * num2;
                break;

            case '/':
                output = num1 / num2;
                break;
            default:
                System.out.println("You have entered wrong operator");
        }
    }
}
```

```
return;
    }
    System.out.println(num1+" "+operator+" "+num2+": "+output);
    }
}
```

PROGRAM 4 – STAFF ID

```
import java.util.Scanner;
class Staff {
    private String staffId;
    private String name;
    private int phone;
    private float salary;

    public void accept() {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter Staff Id");
        staffId = scanner.next();
        System.out.println("Enter Name");
        name = scanner.next();
        System.out.println("Enter Phone");
        phone = scanner.nextInt();
        System.out.println("Enter Salary");
        salary = scanner.nextFloat();
    }

    public void display() {
        System.out.println("Staff Id: " + staffId);
        System.out.println("Name: " + name);
        System.out.println("Phone: " + phone);
        System.out.println("Salary: " + salary);
    }
}

import java.util.Scanner;
class Teaching extends Staff {
    private String domain;
    private String[] publications;

    public void accept() {
        super.accept();
        Scanner scanner = new Scanner(System.in);
```

```
        System.out.println("Enter Domain");
        domain = scanner.next();
        System.out.println("Enter Number of Publications");
        int n = scanner.nextInt();
        publications = new String[n];
        System.out.println("Enter Publications");
        for (int i = 0; i < n; i++) {
            publications[i] = scanner.next();
        }
    }
    public void display() {
        super.display();
        System.out.println("Domain: " + domain);
        System.out.println("Publications:");
        for (int i = 0; i < publications.length; i++) {
            System.out.println(publications[i]);
        }
    }
}
import java.util.Scanner;
class Technical extends Staff {
    private String[] skills;
    public void accept() {
        super.accept();
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter Number of Skills");
        int n = scanner.nextInt();
        skills = new String[n];
        System.out.println("Enter Skills");
        for (int i = 0; i < n; i++) {
            skills[i] = scanner.next();
        }
    }
    public void display() {
        super.display();
        System.out.println("Skills:");
        for (int i = 0; i < skills.length; i++) {
            System.out.println(skills[i]);
        }
    }
}
```

```
import java.util.Scanner;
class Contract extends Staff {
    private int period;

    public void accept() {
super.accept();
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter Period");
        period = scanner.nextInt();
    }
    public void display() {
super.display();
        System.out.println("Period: " + period);
    }
}
class Main {
    public static void main(String[] args) {
        Teaching teaching = new Teaching();
        Technical technical = new Technical();
        Contract contract = new Contract();

        System.out.println("Enter Details for Teaching Staff Member");
teaching.accept();
        System.out.println("Enter Details for Technical Staff Member");
technical.accept();
        System.out.println("Enter Details for Contract Staff Member");
contract.accept();

        System.out.println("Details for Teaching Staff Member are");
teaching.display();
        System.out.println("Details for Technical Staff Member are");
technical.display();
        System.out.println("Details for Contract Staff Member are");
contract.display();
    }
}
```

PROGRAM 5- METHOD AND CONSTRUCTOR OVERLOADING
PROGRAM-5A

```
public class Calc {  
    public void add(int i,int j)  
    {  
        System.out.println(i+j);  
    }  
    public void add(int i,intj,int k)  
    {  
        System.out.println(i+j+k);  
    }  
    public void add(double i,double j)  
    {  
        System.out.println(i+j);  
    }  
}  
public class MethodOverloading {  
    public static void main(String [] args)  
    {  
        Calc obj = new Calc();  
        obj.add(5,2);  
        obj.add(4,3,5);  
        obj.add(4.5,3.8);  
    }  
}
```

PROGRAM-5B

```
public class Test {  
    int x;  
    int y;  
    int total;  
    Test()  
    {  
        x=20;  
        y=30;  
    }  
    Test(int a)  
    {  
        x=a;  
    }  
}
```



```
y=a;
}
Test(int a, int b)
{
x=a;
y=b;
}
public void add()
{
total = x+y;
System.out.println(total);
}
public static void main(String [] args)
{
Test t1 = new Test();
Test t1 = new Test(40);
Test t1 = new Test(50,60);
t1.add();
t2.add();
t3.add();
}
}
```

PROGRAM 6- CURRENCY, DISTANCE, TIME CONVERTER

CURRENCY.JAVA

```
package currencyconversion;
import java.util.*;
public class currency
{
double inr,usd;
double euro,yen;
Scanner in=new Scanner(System.in);
public void dollartorupee()
{
System.out.println("Enter dollars to convert into Rupees:");
usd=in.nextInt();
inr=usd*67;
System.out.println("Dollar =" +usd+"equal to INR="+inr);
}
public void rupeetodollar()
{
System.out.println("Enter Rupee to convert into Dollars:");
```

```
inr=in.nextInt();
usd=inr/67;
System.out.println("Rupee =" +inr+"equal to Dollars="+usd);
}
public void eurotorupee()
{
System.out.println("Enter euro to convert into Rupees:");
euro=in.nextInt();
inr=euro*79.50;
System.out.println("Euro =" +euro +"equal to INR="+inr);
}
public void rupeetoeuro()
{
System.out.println("Enter Rupees to convert into Euro:");
inr=in.nextInt();
euro=(inr/79.50);
System.out.println("Rupee =" +inr +"equal to Euro="+euro);
}
public void yentorupee()
{
System.out.println("Enter yen to convert into Rupees:");
yen=in.nextInt();
inr=yen*0.61;
System.out.println("YEN="+yen +"equal to INR="+inr);
}
public void rupeetoyen()
{
System.out.println("Enter Rupees to convert into Yen:");
inr=in.nextInt();
yen=(inr/0.61);
System.out.println("INR="+inr +"equal to YEN"+yen);
}
}
```

DISTANCE CONVERTER.JAVA

```
package distanceconversion;
import java.util.*;
public class distance
{
double km,m,miles;
Scanner sc = new Scanner(System.in);
public void kmtom()
{
```

```
System.out.print("Enter in km ");
km=sc.nextDouble();
m=(km*1000);
System.out.println(km+"km" +"equal to"+m+"metres");
}
public void mtokm()
{
System.out.print("Enter in meter ");
m=sc.nextDouble();
km=(m/1000);
System.out.println(m+"m" +"equal to"+km+"kilometres");
}
public void milestokm()
{
System.out.print("Enter in miles");
miles=sc.nextDouble();
km=(miles*1.60934);
System.out.println(miles+"miles" +"equal to"+km+"kilometres");
}
public void kmtomiles()
{
System.out.print("Enter in km");
km=sc.nextDouble();
miles=(km*0.621371);
System.out.println(km+"km" +"equal to"+miles+"miles");
}
}
```

TIME CONVERTER.JAVA

```
package timeconversion;
import java.util.*;
public class timer
{
int hours,seconds,minutes;
int input;
Scanner sc = new Scanner(System.in);
public void secondstohours()
{
System.out.print("Enter the number of seconds: ");
input = sc.nextInt();
hours = input / 3600;
minutes = (input % 3600) / 60;
seconds = (input % 3600) % 60;
}
```

```
System.out.println("Hours: " + hours);
System.out.println("Minutes: " + minutes);
System.out.println("Seconds: " + seconds);
}
public void minutestohours()
{
System.out.print("Enter the number of minutes: ");
minutes=sc.nextInt();
hours=minutes/60;
minutes=minutes%60;
System.out.println("Hours: " + hours);
System.out.println("Minutes: " + minutes);
}
public void hourstominutes()
{
System.out.println("enter the no of hours");
hours=sc.nextInt();
minutes=(hours*60);
System.out.println("Minutes: " + minutes);
}
public void hourstoseconds()
{
System.out.println("enter the no of hours");
hours=sc.nextInt();
seconds=(hours*3600);
System.out.println("Minutes: " + seconds);
}
}
```

MAIN.JAVA

```
import java.util.*;
import java.io.*;
import currencyconversion.*;
import distanceconversion.*;
import timeconversion.*;
class converter
{
public static void main(String args[])
{
```

```
Scanner s=new Scanner(System.in);
int choice,ch;
currency c=new currency();
distance d=new distance();
timer t=new timer();
do
{
System.out.println("1.dollar to rupee ");
System.out.println("2.rupee to dollar ");
System.out.println("3.Euro to rupee ");
System.out.println("4..rupee to Euro ");
System.out.println("5.Yen to rupee ");
System.out.println("6.Rupee to Yen ");
System.out.println("7.Meter to kilometer ");
System.out.println("8.kilometer to meter ");
System.out.println("9.Miles to kilometer ");
System.out.println("10.kilometer to miles");
System.out.println("11.Hours to Minutes");
System.out.println("12.Hours to Seconds");
System.out.println("13.Seconds to Hours");
System.out.println("14.Minutes to Hours");
System.out.println("Enter ur choice");
choice=s.nextInt();
switch(choice)
{
case 1:
{
c.dollartorupee();
break;
}
case 2:
{
c.rupeetodollar();
break;
}
case 3:
{
c.eurotorupee();
break;
}
case 4:
{
c.rupeetoeuro();
break;
}
```

```
}  
case 5:  
{  
c.yentorupee();  
break;}  
case 6 :  
{  
c.rupeetoyen();  
break;  
}  
case 7 :  
{  
d.mtokm();  
break;  
}  
case 8 :  
{  
d.kmtom();  
break;  
}  
case 9 :  
{  
d.milestokm();  
break;  
}  
case 10 :  
{  
d.kmtomiles();  
break;  
}  
case 11 :  
{  
t.hourstominutes();  
break;  
}  
case 12 :  
{  
t.hourstoseconds();  
break;  
}  
case 13 :  
{  
t.secondstohours();  
break;
```

```
}  
case 14 :  
{  
t.minutestohours();  
break;  
}}  
System.out.println("Enter 0 to quit and 1 to continue ");  
ch=s.nextInt();  
}while(ch==1);  
}  
}
```

PROGRAM 7- RESUME CREATION

```
interface Resume  
{  
void biodata();  
}  
class Teacher implements Resume  
{  
String name,qualification,achievements;  
float experience;  
public void biodata()  
{  
name="Mrs.Supriya.S";  
qualification="M.Tech";  
achievements="Q1 publication";  
experience=10;  
System.out.println("Teacher Resume");  
System.out.println("Name : " +name);  
System.out.println("Qualification : "+qualification);  
System.out.println("Achievements : "+achievements);  
System.out.println("Experience : "+experience);  
}  
}  
class Student implements Resume  
{  
String name,disipline;  
float result;  
public void biodata()  
{  
name="Rahul Sharma";  
result=9.8f;  
disipline="Computer Science and Engineering";  
System.out.println("");  
}
```

```
System.out.println("Student Resume");
System.out.println("Name : " +name);
System.out.println("Result : "+result+" cgpa");
System.out.println("Discipline : "+discipline);
}
}
public class InterfaceP
{
public static void main(String[] args)
{
Teacher obj1=new Teacher();
obj1.biodata();
Student obj2=new Student();
obj2.biodata();
}
}
```

PROGRAM 8-MULTITHREADING

```
import java.util.Random;
class Square extends Thread
{
int x;
Square(int n)
{
x = n;
}
public void run()
{
int sqr = x * x;
System.out.println("Square of " + x + " = " + sqr );
}
}
class Cube extends Thread
{
int x;
Cube(int n)
{
x = n;
}
public void run()
{
int cub = x * x * x;
```



```
System.out.println("Cube of " + x + " = " + cub );
}
}
class Rnumber extends Thread
{
    public void run()
    {

        Random random = new Random();
        for(int i =0; i<5; i++)

        {

            int randomInteger = random.nextInt(10);
            System.out.println("Random Integer generated : " + randomInteger);
            Square s = new Square(randomInteger);
            s.start();
            Cube c = new Cube(randomInteger);
            c.start();
            try
            {

                Thread.sleep(1000);

            }
            catch (InterruptedException ex)
            {
                System.out.println(ex);
            }
        }
    }
}
public class ThreadP
{
    public static void main(String[] args)
    {
        Rnumber n = new Rnumber();

        n.start();
    }
}
```

PROGRAM 9-COLLECTIONS IN JAVA

```
import java.util.*;
public class ArrayL
{
    ArrayList<String> list=new ArrayList<String>();
    public void arraydisplay()
    {
        list.add("CSE");
        list.add("ISE");
        list.add("ME");
        System.out.println("ArrayList element are");
        System.out.println(list);
        System.out.println("");
    }
    public void appendatend()
    {
        System.out.println("Enter the element to append at end");
        Scanner scob1=new Scanner(System.in);
        String ele=scob1.next();
        list.add(ele);
        System.out.println(list);
        System.out.println("");
    }
    public void insertatpos()
    {
        System.out.println("Enter the position and element to insert");
        Scanner scob1=new Scanner(System.in);
        int posind=scob1.nextInt();
        String ele=scob1.next();
        list.add(posind,ele);
        System.out.println(list);
        System.out.println("");
    }
    public void searchele()
    {
        System.out.println("Enter the Array element to search");
        Scanner scobj=new Scanner(System.in);
        String arele=scobj.next();
        int in=list.indexOf(arele);
        if(in!=-1)
```

```
{
System.out.println("Element not found");
}
else
{
System.out.println("Element found at "+in);
}
}
void print()
{
Scanner nip=new Scanner(System.in);
System.out.println("Enter the starting charecter to print strings");
char inputc=nip.next().charAt(0);
String strc=Character.toString(inputc);
System.out.println("String starting with character "+strc);
for(int i=0;i<list.size();i++)

{
if(list.get(i).startsWith(strc))
{
System.out.println(list.get(i));
}
}
}
public static void main(String args[])
{
ArrayL obj=new ArrayL();
obj.arraydisplay();
obj.appendatend();
obj.insertatpos();
obj.searchele();
obj.print();
}
}
```

PROGRAM 10-EXCEPTION HANDLING IN JAVA

```
import java.util.*;
public class TryP
{
int c;
```

```
void div(int a,int b)
{
try
{
c=a/b;
System.out.println("Result="+c);
}
catch(ArithmeticException e)
{
System.out.println("Cannot divide by zero");
}
}
public static void main(String args[])
{
TryP obj=new TryP();
Scanner in=new Scanner(System.in);
System.out.println("Enter the values of a and b");
int no1=in.nextInt();
int no2=in.nextInt();
obj.div(no1,no2);
}
}
```

PROGRAM 11- FILE OPERATION

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

File f1 = new File(fname);
System.out.println("File Name: " + f1.getName());
f1.setWritable(false);
System.out.println(f1.exists() ? "File exists" : "File does not exist");
System.out.println(f1.canWrite() ? "File is writeable" : "File is not writeable");
System.out.println(f1.canRead() ? "File is readable" : "File is not readable");
String fileName = f1.toString();
int index = fileName.lastIndexOf('.');
```

```
if(index > 0)
{
String type = fileName.substring(index + 1);
System.out.println("File type is " + type);
}
else
{

System.out.println("File doesn't have type");
}

System.out.println("File size: " + f1.length() + " Bytes");
}
}
```

PROGRAM 12A-APPLET

```
import java.applet.Applet;
import java.awt.Graphics;
/*
<applet code="AppletP.class" width="300" height="300">
</applet>
*/
public class AppletP extends Applet
{
public void paint(Graphics g)
{
g.drawString("Welcome to applet",100,150);
}
}
```

PROGRAM 12B-CALCULATOR USING SWING

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
class Calculator implements ActionListener
{
JFrame frame;
JTextField t;
JButton b0,b1,b2,b3,b4,b5,b6,b7,b8,b9,bdot,badd,bmul,bdiv,beq,bclr;
```

```
static double a=0,b=0,res=0;
static int op=0;
public void Display()
{
    frame=new JFrame();
    frame.setTitle("IUK Calculator");
    frame.setSize(225,300);
    frame.setLayout(null);
    frame.setBackground(Color.black);
    frame.setResizable(true);
    frame.setVisible(true);
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    t=new JTextField();
    t.setBounds(30,10,165,35);
    b0=new JButton("0");
    b0.setBounds(30,50,45,40);
    b1=new JButton("1");
    b1.setBounds(70,50,45,40);
    b2=new JButton("2");
    b2.setBounds(110,50,45,40);
    b3=new JButton("3");
    b3.setBounds(150,50,45,40);
    b4=new JButton("4");
    b4.setBounds(30,90,45,40);
    b5=new JButton("5");
    b5.setBounds(70,90,45,40);
    b6=new JButton("6");
    b6.setBounds(110,90,45,40);
    b7=new JButton("7");
    b7.setBounds(150,90,45,40);
    b8=new JButton("8");
    b8.setBounds(30,130,45,40);
    b9=new JButton("9");
    b9.setBounds(70,130,45,40);
    bdot=new JButton(".");
    bdot.setBounds(110,130,45,40);
    badd=new JButton("+");
    badd.setBounds(150,130,45,40);
    bsub=new JButton("-");
    bsub.setBounds(30,170,45,40);
    bmul=new JButton("*");
```

```
bmul.setBounds(70,170,45,40);
bdiv=new JButton("/");
bdiv.setBounds(110,170,45,40);
beq=new JButton("=");
beq.setBounds(150,170,45,40);
bclr=new JButton("CLR");
bclr.setBounds(30,210,165,40);
frame.add(t);
frame.add(b0);
frame.add(b1);
frame.add(b2);
frame.add(b3);
frame.add(b4);
frame.add(b5);
frame.add(b6);
frame.add(b7);
frame.add(b8);
frame.add(b9);
frame.add(bdot);
frame.add(badd);
frame.add(bsub);
frame.add(bmul);
frame.add(bdiv);
frame.add(beq);
frame.add(bclr);
b0.addActionListener(this);
b1.addActionListener(this);
b2.addActionListener(this);
b3.addActionListener(this);
b4.addActionListener(this);
b5.addActionListener(this);
b6.addActionListener(this);
b7.addActionListener(this);
b8.addActionListener(this);
b9.addActionListener(this);
badd.addActionListener(this);
bsub.addActionListener(this);
bmul.addActionListener(this);
bdiv.addActionListener(this);
bdot.addActionListener(this);
beq.addActionListener(this);
```

```
bclr.addActionListener(this);
}
public void actionPerformed(ActionEvent e)
{
    if(e.getSource()==bclr)
    {
        t.setText("");
    }
    if(e.getSource()==b0)
    {
        t.setText(t.getText().concat("0"));
    }
    if(e.getSource()==b1)
    {
        t.setText(t.getText().concat("1"));
    }
    if(e.getSource()==b2)
    {
        t.setText(t.getText().concat("2"));
    }
    if(e.getSource()==b3)
    {
        t.setText(t.getText().concat("3"));
    }
    if(e.getSource()==b4)
    {
        t.setText(t.getText().concat("4"));
    }
    if(e.getSource()==b5)
    {
        t.setText(t.getText().concat("5"));
    }
    if(e.getSource()==b6)
    {
        t.setText(t.getText().concat("6"));
    }
    if(e.getSource()==b7)
    {
        t.setText(t.getText().concat("7"));
    }
    if(e.getSource()==b8)
```



```
{
t.setText(t.getText().concat("8"));
}
if(e.getSource()==b9)
{
t.setText(t.getText().concat("9"));
}
if(e.getSource()==bdot)
{
t.setText(t.getText().concat("."));
}
if(e.getSource()==badd)
{
a=Double.parseDouble(t.getText());
op=1;
t.setText("");
}
if(e.getSource()==bsub)
{
a=Double.parseDouble(t.getText());
op=2;
t.setText("");
}
if(e.getSource()==bmul)
{
a=Double.parseDouble(t.getText());
op=3;
t.setText("");
}
if(e.getSource()==bdiv)
{
a=Double.parseDouble(t.getText());
op=4;
t.setText("");
}
if(e.getSource()==beq)
{
b=Double.parseDouble(t.getText());
switch(op)
{
case 1:res=a+b;
```

```
break;
case 2:res=a-b;
break;
case 3:res=a*b;
break;
case 4:res=a/b;
break;
}
t.setText(""+res);
}
}
}
public class CalculatorP
{
public static void main(String[] args)
{
Calculator obj=new Calculator();
obj.Display();
}
}
```