

③ Write a Java program to calculate roots of quadratic equation. Use appropriate methods to take input, and calculate the roots.

```
import java.util.Scanner;
```

```
class Quad {
```

```
    int a, b, c;
```

```
    double root1, root2, d;
```

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

```
    void input ()
```

```
    {  
        System.out.println("Quadratic equation is of  
        form:  $ax^2 + bx + c$ ");
```

```
        System.out.print("Enter a:");
```

```
        a = s.nextInt();
```

```
        System.out.print("Enter b:");
```

```
        b = s.nextInt();
```

```
        System.out.print("Enter c:");
```

```
        c = s.nextInt();
```

```
    }
```

```
    void discriminant () {
```

```
        d = (b*b) - (4*a*c);
```

```
    }
```

```
void calculateRoots()
```

```
{  
    if (d > 0)
```

```
{
```

```
        System.out.println("Roots are real and  
Roots are real and unequal");
```

```
        root1 = (-b + Math.sqrt(d)/(2*a));
```

```
        root2 = (-b - Math.sqrt(d)/(2*a));
```

```
        System.out.println("First root is: " + root1);
```

```
        System.out.println("Second root is: " + root2);
```

```
}
```

```
    else if (d == 0)
```

```
{
```

```
        System.out.println("Roots are real and equal");
```

```
        root1 = (-b + Math.sqrt(d)/(2*a));
```

```
        System.out.println("Root: " + root1);
```

```
}
```

```
    else
```

```
{
```

```
        System.out.println("No real solutions. Roots  
are imaginary");
```

```
        double real = -b/(2*a);
```

```
        double imaginary = Math.sqrt(-d)/(2*a);
```

```
        System.out.println("The equation has two complex roots:  
" + real + " + " + imaginary + "i and  
" + real + " - " + imaginary + "i");
```

```
}
```

```
}
```

```
}
```

class main

```
public static void main(String[] args) {  
    Quad q = new Quad();  
    q.Input();  
    q.discriminant();  
    q.calculate_roots();  
}
```

O/P:

Enter a:

5

Enter b:

12

Enter c:

6

No real solution. Roots are imaginary.

The each has 2 complex roots:

$0.00 + 1.255261i$ & $0.00 - 1.255261i$

①

12/01/24

```
import java.util.Scanner;  
class Books
```

```
{  
    String name;  
    String author;  
    int price;  
    int numPages;
```

```
    Books() {}  
    Books (String name, String author, int price, int  
            numPages)
```

```
{  
    this.name = name;  
    this.author = author;  
    this.price = price;  
    this.numPages = numPages;
```

```
}  
public String to String()
```

```
{  
    String name; String author; price; numPages;  
    name = "book name:" + this.name + "\n";  
    author = "author name:" + this.author + "\n";  
    price = "price:" + this.price + "\n";  
    numPage = "Number of pages:" + this.numPages + "\n";  
    return name + author + price + numPages;
```



```
class Main
```

```
{  
    public static void main()
```

```
{  
    Scanner s = new Scanner(System.in);
```

```
    int n;
```

```
    String name;
```

```
    String author;
```

```
    int price;
```

```
    int numPages;
```

```
    System.out.print("Enter no. of books: ");
```

```
    n = s.nextInt();
```

```
    Books b[];
```

```
    b = new Books[n];
```

```
    for (int i = 0; i < n; i++)
```

```
{  
        System.out.print("Book " + (i+1) + ": ");
```

```
        System.out.print("Enter name of book: ");
```

```
        name = s.next();
```

```
        System.out.print("Enter author: ");
```

```
        author = s.next();
```

```
        System.out.print("Enter price: ");
```

```
        price = s.nextInt();
```

```
        System.out.print("Enter no of Pages: ");
```

```
        numPages = s.nextInt();
```

```
        b[i] = new Books(name, author, price, numPages);
```

```
    }
```

```
    for (int i = 0; i < n; i++)
```

```
    {  
        System.out.print("Book " + (i+1) + ": ");
```

```
    }
```

```
}
```

Q/f:

Enter number of books: 2

Book 1: Enter the name of Book: OS

Enter author: KAMAL

Enter price: 360

Enter no of pages: 900

Book 2: Enter the name of Book: Java

Enter author: Sachin

Enter price: 780

Enter no of pages: 390

Books 1:

Book name: ~~KARMA~~ OS

Author Name: KAMAL

Price: 360

No of pages: 900

Book 2:

Book name: Java

Author name: Sachin

Price: 780

No of pages: 390

```
import java.util.Scanner;
```

```
class Student {  
    String USN;  
    String Name;  
    double[] marks = new double[6];
```

```
    void inputDetails() {  
        Scanner s = new Scanner(System.in);  
        sop("Enter USN:");  
        USN = s.nextLine();  
        sop("Enter name:");  
        Name = s.nextLine();  
        sop("Enter marks for 6 subjects:");  
        for (int i = 0; i < 6; i++) {  
            sop("Subject " + (i + 1) + ":");  
            marks[i] = s.nextDouble();  
        }  
    }
```

```
    double calculatePercentage() {  
        double totalMarks = 0;  
        for (double mark : marks) {  
            totalMarks += mark;  
        }
```

```
        return (totalMarks / 6);  
    }
```

```

void displayDetails() {
    sop("Student Details:");
    sop("USN:" + USN);
    sop("Name:" + name);
    sop("Percentage:" + calculatePercentage() + "%");
}

```

```

public class main {
    public static void main()
    {

```

```

        Scanner s = new Scanner(System.in);
        sop("Enter no of students:");
        int numberOfStudents = s.nextInt();

```

```

        Student[] students = new Student[numberOfStudents];

```

```

        for (i = 0; i < numberOfStudents; i++) {
            sop("Enter details for student " + (i+1) + ":");
            students[i] = new Student();
            students[i].inputDetails();

```

```

        }
        for (Student student : students) {
            student.displayDetails();

```

```

        }
    }
}

```


Q13

Enter Number of students: 1

Enter detail for student 1:

Enter USN: 1BM22C8308

Enter Name: Tefas

Enter marks for 6 subjects:

subject 1: 95

subject 2: 92

subject 3: 90

subject 4: 99

subject 5: 98

subject 6: 89

Student details:

USN: 1BM22C8227

Name: Tefas

Percentage: 93.8%

12/11/24

16/02/24

1) CIE Package;

```
package CIE;
```

```
public class Student {  
    String USN, name;  
    int idm;  
}
```

```
public class Internals extends Student {  
    int[] internalMarks = new int[5];  
}
```

```
package SEE;  
import CIE.Student;
```

```
public class External extends Student {  
    int[] remarks = new int[5];  
}
```

```
import CIE.Internals;
```

```
import SEE.Externals;
```

```
public class main {  
    public static void main() {
```

```
        int[] internalMarks = { 85, 76, 98, 78, 67 };  
        Internals student1 = new Internals("16m22C1297", "Sri",  
                                             3);
```

③

```
class DisplayThread extends Thread {  
    private String message;  
    private int interval;  
    private boolean running = true;
```

```
    public DisplayThread (String message, int interval) {  
        this.message = message;  
        this.interval = interval;
```

```
    {  
        public void run () {  
            while (running) {  
                SOP (message);  
                try {  
                    Thread.sleep(interval);  
                } catch (InterruptedException e) {  
                    e.printStackTrace();  
                }  
            }  
        }  
    }
```

```
    {  
        public void stopThread () {  
            running = false;
```

```
    }  
}
```

```

public class ThreadExample3
{
    public static void main() {
        DisplayThread t1 = new DisplayThread
        ("BMS", 10000);
        DisplayThread t2 = new DisplayThread
        ("CSE", 2000);

        t1.start();
        t2.start();

        System.out.println("Press Enter to stop the threads");
        try {
            System.in.read();
        } catch (Exception e) {
            e.printStackTrace();
        }

        t1.stopThread();
        t2.stopThread();
    }
}

```

OP:
 BMS
 CSE
 CSE
 CSE
 CSE
 CSE
 BMS

②

```
class Wrongage extends Exception Exception {  
    Wrongage(String message) {  
        super(message);  
    }  
}
```

```
class Father {  
    int fatherage;
```

```
    Father(int age) throws Wrongage {
```

```
        if (age < 0) {
```

```
            throw new Wrongage("Age cannot be Negative");
```

```
        }  
        this.fatherage = age;
```

```
    }  
  
class Son extends Father {  
    int sonAge;
```

```
    Son(int fatherAge, int sonAge) throws Wrongage {  
        super(fatherAge);
```

```
        if (sonAge >= fatherAge) {
```

```
            throw new Wrongage("Son age should be less than father age.");
```

```
        }  
        this.sonAge = sonAge;
```

```
public class ExceptionInsuranceDemo {  
    public() {
```

```
        try {
```

```
            Father father = new Father(40);
```

```
            Son son = new Son(40, 20);
```

```
        } catch (WrongAge e) {
```

```
            System.out.println("Exception: " + e.getMessage());
```

```
        }  
    }  
}
```

O/P :-

Enter father's age : 20

Enter son's age : 40

Exception son's age cannot be greater's age

23/02/24

- ① Creating label, button & text field in a frame using AWT.

```
import java.awt.*;  
import java.awt.event.*;
```

```
public class AWTExample extends WindowAdapter  
Frame f;
```

```
AWTExample() {
```

```
    f = new Frame();
```

```
    f.addWindowListener(this);
```

```
    Label l = new Label("Employee id:");
```

```
    Button b = new Button("Submit");
```

```
    TextField t = new TextField();
```

```
    l.setBounds(20, 80, 80, 30);
```

```
    t.setBounds(90, 100, 80, 30);
```

```
    b.setBounds(100, 100, 80, 30);
```

```
    f.add(b);
```

```
    f.add(l);
```

```
    f.add(t);
```

```
    f.setSize(400, 300);
```

```
    f.setTitle("Employee Info");
```

```
    f.setLayout(null);
```

```
    f.setVisible(true);
```

3

```
public void windowClosing(WindowEvent e) {  
    System.exit(0);  
}
```

```
public static void main (0) {  
    AWTExample awt obj = new AWTExample();  
}
```

AWTExample

- □ X

Enter your name :

2) Create a button & add a action listener for mouse click.

```
public class ButtonExample1  
{  
    public static void main()
```

```
{  
    JFrame frame = new JFrame("Button Example");
```

```
    JButton button = new JButton("Click me");  
    button.setBounds(100, 100, 80, 30);
```

```
    button.addActionListener(new ActionListener() {  
        public void actionPerformed(ActionEvent e) {  
            JOptionPane.showMessageDialog(frame, "Button clicked!");
```

```
        }  
    });
```

```
    frame.add(button);
```

```
    frame.setLayout(null);
```

```
    frame.setSize(300, 200);
```

```
    frame.setVisible(true);
```

```
}
```

Welcome

Click me

③ Example 2;

```
import java.io.*;
```

```
public class ByteArrayEx2
```

```
throws Exception {
```

```
    FileOutputStream fout1 = new FileOutputStream("Example.txt");
```

```
    FileOutputStream fout2 = new FileOutputStream("Example2.txt");
```

```
    ByteArrayOutputStream baout = new ByteArrayOutputStream();
```

```
    baout.write(65);
```

```
    baout.writeTo(fout1);
```

```
    baout.writeTo(fout2);
```

```
    baout.flush();
```

```
    baout.close();
```

```
    System.out.println("Success...");
```

99;

Success

④ Example 13;

```
import java.io.*;
```

psvm() throws IOException;

```
byte[] buf = { 35, 36, 37, 38};
```

```
ByteArrayInputStream byt = new ByteArrayInputStream  
(buf);
```

```
int k = 0;
```

```
while ((k = byt.read()) != -1) {
```

```
    char ch = (char) k;
```

```
    System.out.print("ASCII value of character is: " + k + "; Special  
    character is: " + ch);
```

ASCII value of character is: 35	Special character is: \$
36	%
37	&
38	+

⑥ Example 4;

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

```
public class FileEx2 {  
    public () throws IOException {  
        FileInputStream fis = new FileInputStream("Sample.txt");  
        byte[] bytes = new byte[20];  
        int i;  
        char c;  
        i = fis.read(bytes);  
        System.out.println("Number of bytes read: " + i);  
        System.out.println("Bytes read:");
```

```
        for (byte b : bytes) {
```

```
            c = (char) b;  
            System.out.print(c);
```

4
3
2
1

23/2/24