

# 1) Student Program:

```
import java.util.Scanner;  
class Student  
{  
    String name, usn;  
    int marks[] = new int[10];  
    Scanner sn = new Scanner(System.in);  
void setMarks()  
{  
    for(int i=0; i<6; i++)  
    void acceptDetails()  
    {  
        System.out.println("Enter the USN");  
        usn = sn.next();  
        System.out.println("Enter the name");  
        name = sn.next();  
        System.out.println("Enter 6 marks");  
        for(int i=0; i<6; i++)  
        {  
            marks[i] = sn.nextInt();  
        }  
    }  
}
```

```
double calculate()
```

```
{
```

```
    int sum = 0;
```

```
    double per;
```

```
    for(int i=0; i<6; i++)
```

```
{
```

```
    sum = sum + marks[i];
```

```
}
```

```
    per = sum / 6.0;
```

```
    return per;
```

```
}
```

```
void display()
```

```
{
```

```
    System.out.println("The name of student is :" + name)
```

```
    System.out.println("The usn of student is :" + usn);
```

```
    System.out.println("The percentage of student is :" +  
        calculate() + "(%)");
```

```
}
```

```
public static void main (String args [])
```

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

```
System.out.println ("Enter no of students"),
```

```
int stu = sn.nextInt();
```

```
Student [] student = new Student [stu];
```

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

```
{ student [i] = new Student ();
```

```
System.out.println ("Enter details of the student");
```

```
student [i].setDetails ();
```

```
}
```

```
System.out.println ("Student details are :");
```

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

```
{ System.out.println ("Details of student " + (i+1) + "
```

```
are");
```

```
student [i].calculate ();
```

```
}
```

```
sn.close ();
```

```
}
```



S/p:

Enter no of students: 3.

Enter details of student 1:

Enter other name: ~~Rahul~~ Aditya

Enter the USN: IBN22CS011

Enter 6 marks: 45

66

90

85

71

99.

Enter details of student 2:

Enter name of student: Roshan.

Enter the usn: IBM22IS569.

Enter 6 marks: 48

60

98

100

99.

Enter details of Student 3:

Enter name of student: Rahul

Enter usn: IBM22ME420

Enter 6 marks: 22 80 65 40 100 100 90.

Student Details are:

Name of Student 1 is Aditya.

USN of student is IBM22CS011

The percentage is 85.03%.

Name of student is Roshan

USN of student is IBM22IS069

The percentage is : 90.45%.

Name of Student is Rahul.

USN of student is IBM22MF0420

The percentage is 88.24%.



## ✓) Quadratic Eqn:

```
import java.util.*;
import java.lang.Math;
class Quad {
    double a,b,c, r1, r2, r, i;
    void input()
    {
        Scanner sc = new Scanner(System.in));
        System.out.println("Enter the 1st coefficient");
        a = sc.nextInt();
        System.out.println("Enter the 2nd coefficient");
        b = sc.nextInt();
        System.out.println("Enter the 3rd coefficient");
        c = sc.nextInt();
    }
    void calc()
    {
        double d = b*b - 4*a*c;
        if(d>0)
        {
            r1 = (-b+Math.sqrt(d))/(2*a);
            r2 = (-b-Math.sqrt(d))/(2*a);
        }
    }
}
```

```
System.out.println("The roots are real & distinct = " + r1 + " and  
" + r2);
```

```
}
```

```
else if (d < 0) {
```

```
    r = -b / (2 * a);
```

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

```
System.out.println("The roots are imaginary & distinct :  
" + r1 + " + " + i + " and " + r2 + " + " + i);
```

```
else {
```

```
    r = -b / (2 * a);
```

```
System.out.println("The roots are real and equal : " + r);
```

```
}
```

```
}
```

```
class Quad {
```

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

~~```
    Quad q = new Quad();
```~~

```
    q.input();
```

```
    q.calc();
```

```
}
```

```
}
```

Olp

Enter first coefficient

1

Enter second coefficient

2

Enter 3<sup>rd</sup> coefficient

1

Roots are real and equal: -1.0.

✓

```
1. abstract class Shape {
    protected int side1;
    protected int side2;
    public static void main (String args[]) {
        public Shape(int side1, int side2) {
            this.side1 = side1,
            this.side2 = side2;
        }
        public abstract void printArea();
    }
}
2. class Rectangle extends Shape {
    public Rectangle(int length, int width) {
        super(length, width);
    }
}
3. @Override
public void printArea() {
    int area = side1 * side2;
    System.out.println("Area of rectangle : " + area);
}
```

```
class Triangle extends Shape{
```

```
    public Triangle(int base, int height){
```

```
        super(base, height),
```

```
}
```

```
@Override
```

```
    public void printArea(){
```

```
        double area = 0.5 * side1 * side2;
```

```
        System.out.println("Area of Triangle : " + area);
```

```
}
```

```
}.
```

```
class Circle extends Shape{
```

```
    public Circle(int radius){
```

```
        super(radius, 0);
```

```
}
```

```
@Override
```

```
    public void printArea(){
```

```
        double area = Math.PI * side1 * side1;
```

```
        System.out.println("Area of Circle : " + area);
```

```
}
```

```
}.
```

```
public class Main {  
    public static void main(String args[]) {  
        Rectangle rectangle = new Rectangle(5, 10);  
        rectangle.printArea();  
  
        Triangle triangle = new Triangle(8, 6);  
        triangle.printArea();  
  
        Circle circle = new Circle(4);  
        circle.printArea();  
    }  
}
```

A O/P  
Area of Rectangle = 50

Area of Triangle = 24

Area of Circle = 50.264

Q

2) Bank account class:

```
import java.util.Scanner;  
class Account {  
    boolean cheque;  
    String name;  
    long accno;  
    String acctype;  
    double bal;  
    Scanner sc = new Scanner(System.in);  
    Account(String name, long accno, String acctype,  
            double bal, boolean cheque) {  
        this.name = name;  
        this.accno = accno;  
        this.acctype = acctype;  
        this.bal = bal;  
        this.cheque = cheque;  
    }  
},
```

3

```
void dept() {  
    System.out.println("Enter amount to be deposited");  
    double amt = sn.nextDouble();  
    bal += amt;  
}
```

4

```
void display_Bal() {
```

```
    System.out.println("Balance : "+bal);
```

5

```
public void interest() {
```

~~System.out.println("Enter rate : ");~~

```
    double rate = sn.nextDouble();
```

```
    if ("Savings".equals(acctype)) {
```

```
        double interest = bal * (rate/100);
```

```
        bal += interest;
```

6

7

```
public void withdraw() {
    System.out.println("Enter amount to be withdrawn");
    double amt = sc.nextDouble();
    if(amt <= bal) {
        bal -= amt;
    } else {
        System.out.println("Insufficient funds");
    }
}

class SavAcct extends Account {
    public SavAcct(String name, long accno, double bal, boolean cheque) {
        super(name, accno, "Savings", bal, cheque);
    }
}

class CurrentAcct extends Account {
    double minBal;
    double serv;
    public CurrentAcct(String name, long accno, double bal, double minBal,
                        double serv, boolean cheque) {
        super(name, accno, "Current", bal, cheque);
    }
}
```

```
this.minbal = minbal,  
this.serv = serv;  
@Override  
public void withdraw() {  
    System.out.println("Enter amount to be withdrawn");  
    double amt = scan.nextDouble();  
    if (amt <= bal - minbal) {  
        bal -= amt;  
    }  
    else {  
        System.out.println("Insufficient funds");  
    }  
}  
public void check() {  
    if (bal < minbal) {  
        bal -= serv;  
        System.out.println("Service charges applied");  
    }  
}
```

```
class Main {  
    public static void main (String args[]) {  
        SavingsAcc s = new SavingsAcc ("Joseph T", "12456930",  
            "1000.0", false);  
  
        CurrentAcc c = new CurrentAcc ("John Mila", "987695",  
            "2500.00", "500.0", "3%",  
            true);  
  
        System.out.println ("Savings Acc : ");  
        s.displayBal()  
        s.dep()  
        s.displayBal()  
        s.interest ()  
        s.displayBal()  
        s.withdraw()  
        s.displayBal()  
  
        System.out.println ("Current Acc : ");  
        c.displayBal();  
        c.dep();  
        c.displayBal();  
        c.withdraw();  
        c.displayBal();  
        c.check();  
        c.displayBal();  
    }  
}
```

18:

Saving Acc:

Balance : 1000.0.

Enter amount to be deposited

250.

Balance : 1200.0.

Enter rate : 8.

Balance : 1296.0.

Enter amount to be withdrawn

670.

Balance : 626.0

Current Acc:

Balance : 2000.0

Amount to be deposited : 0

Balance : 2000.0

~~Amount to withdraw : 1600.~~

Balance : 400.

Service charge approved

Balance : 35.

22/11/24

29/11/24.

Package:

```
package CIE.;  
public class Student {  
    public String usn, name;  
    public int sem;  
    public Student (String usn, String name, int sem){  
        this.usn = usn;  
        this.name = name;  
        this.sem = sem;  
    }  
}.
```

```
package CIE;  
public class Internals extends Student {  
    public double [] internalMarks = new double [5];  
    public Internals (String usn, String name, int  
    sem, double [], internalMarks){  
        super (usn, name, sem, internalMarks);  
        this.internalMarks = internalMarks;  
    }  
}
```

```
package SEE;
import CIE.Student;
public class External extends Student {
    public double [] seeMarks = new double [5];
    public External (String usn, String name, int sem,
                    double [] seeMarks) {
        super (usn, name, sem);
        this.seeMarks = seeMarks;
    }
}
```

```
package result;
```

```
import CIE.Student;
import CIE.Internal;
import SEE.External;
```

```
public class result {
```

```
    public static void main (String args []) {
        double internal [] = {43, 45, 47, 44, 41};
        double external [] = {90, 87, 65, 93, 43};
```

```
        Student s1 = new Student ("IBM22CS150", "Jose");
        Internal s1 = new Internal ("IBM22CS150", "Jose",
                                    3, internal);
```

```
External el = new External ("IBH22CS150", "Jade",  
    external),
```

```
System.out.println ("USN:" + student + "name:" + student.name  
    + "Sem:" + student.sem),
```

```
Sop ("Internal marks"),
```

```
for (int i=0; i<5; i++) {
```

```
    Sop ("Internal marks." + (i+1) + ":" + i1-internal  
        Marks[i]),
```

```
}
```

```
Sop ("External Marks");
```

```
for (int i=0; i<5; i++) {
```

```
    Sop ("External Marks." + (i+1) + ":" + el-external);
```

```
}
```

```
}
```

```
}
```



O/P:

USN: IBM2ACSE150 name: Jose sem: 3

Internal Marks:

Internal Marks 1 : 43

2 : 45

3 : 47

4 : 44

5 : 41

External Marks:

External Marks 1: ~~40~~ 45

2 ~~40~~ 40

3 ~~45~~ 45

4 ~~49~~ 49

5. ~~50~~ 50.

Final Marks:

85/100

Course 1: 98

Course 2: 95

Course 3: 92

Course 4: 93

Course 5: 91

19/2/24: Father - son exception:

class WrongAge extends Exception{

public WrongAge(){

super("Age cannot be negative"),

}

}.

class Father{

private int age;

public Father(int age) throws WrongAge{

if(age < 0){

throw new WrongAge();

}.

this.age = age;

public int getAge(){

} return age;

3. class Son extends Father{

private int sonAge;

public Son(int fatherAge, int sonAge) throws

WrongAge, IllegalArgumentException{

super(fatherAge);

if(sonAge >= fatherAge)

throw new IllegalArgumentException("Son's")

age must be less than father's");

};  
this.sonAge = sonAge;

};  
public int getSonAge() {  
 return sonAge;

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

try {

Father father = new Father(age: 50);  
 Son son = new Son(fatherAge: 50, sonAge: 25);  
 System.out.println("Father's age : " + father.getAge());  
 System.out.println("Son's age : " + son.getSonAge());

};

catch (WrongAge e) {

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

};

~~catch (IllegalArgumentException e) {~~

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

};

};

Q1: Father's age : 50

Son's age : 25

## ② Thread Program.

```
class DisplayMessage extends Thread {
```

```
    private String message;
```

```
    private int interval;
```

```
    public DisplayMessage(String message, int interval);
```

```
        this.message = message;
```

```
        this.interval = interval;
```

```
}
```

@Override

```
public void run() {
```

```
    while(true) {
```

~~```
        System.out.println(message);
```~~~~```
        try {
```~~~~```
            Thread.sleep(interval * 1000);
```~~~~```
        } catch (InterruptedException e) {
```~~~~```
            e.printStackTrace();
```~~~~```
        }
```~~

}. 3 3.

```
public class Main {
```

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

```
DisplayMessage thread 1 = new DisplayMessage  
( message: "BMS College of  
Engineering",  
interval : 10 );
```

```
DisplayMessage thread2 = new Display Message(message: "CSE",  
interval: 2)
```

thead1.start();

thread2.start();

3

3.

O/P: CSE.

BMS College of Engineering

CSE

CSE

# BMS College of Engineering

CSE

CSE

CSE .

# BMS College Of Engineering

CSE

CSE

— 5 —

卷之三

## Q) Book Program.

```
import java.util.*;  
  
class Book {  
  
    private String name;  
    private String author;  
    private double price;  
    private int num_pages;  
  
    public Book(String name, String author, double price,  
               int num_pages) {  
  
        this.name = name;  
        this.author = author;  
        this.price = price;  
        this.num_pages = num_pages;  
    }  
  
    public String getName() {  
        return name;  
    }  
  
    public String getAuthor() {  
        return author;  
    }  
}
```

```
public double getPrice() {  
    return price;  
}
```

```
public int getNumPages() {  
    return numPages;  
}
```

```
public void setName(String name) {  
    this.name = name;  
}
```

```
public void setAuthor(String author) {  
    this.author = author;  
}
```

```
public void setPrice(double price) {  
    this.price = price;  
}
```

```
public void setNumPages(int numPages) {  
    this.numPages = numPages;  
}
```

@Override

public String toString(){

return "Book Details : \n Name "+name+"\n Author  
+ " + author + "\n Price : \$" + price + "\n  
Number of Pages : " + num\_pages;

}

}.

public class BookTest{

public static void main (String args[]){

Scanner sn = new Scanner (System.in);

System.out.println ("Enter n.o of books");

int n = sn.nextInt();

Book [] book = new Book[n];

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

System.out.println ("\nEnter details for Book "+  
(i+1) + ": ");

System.out.print ("Name");

String name = sn.nextLine();

```
System.out.print("Author");
String author = sn.nextLine();
System.out.print("Price");
double price = sn.nextDouble();
System.out.print("Number of pages:");
int numPages = sn.nextInt();
books[i] = new Book(name, author, price, numPages);
```

```
}

System.out.println("\nDetails of all books:");
for(int i=0; i<n; i++) {
    System.out.println("\nBook " + (i+1) + ":");
    System.out.println(books[i]);
}

sn.close();
```

```
}
```

O/P: Enter number of books : 3.

Enter details of Book 1:

Name: To Kill a Mockingbird.

Author: Harper Lee.

Price: 400.

Number of pages: 281.

Enter details of Book 2:

Name: The Catcher in The Rye

Author: J. D Salinger.

Price: 380.

Number of Pages: 328.

Enter details of Book 3:

Name: The Lord of Rings

Author: J. R. R Tolkein

Price: 1000

No of pages: 1200

## Details of all books:

### Book 1:

Name: To kill a MockingBird

Author: Harper Lee.

Price: \$400.

No of pages: 281.

### Book 2:

Name: The catcher in the Rye.

Author: J.D Salinger.

Price: \$380

No of pages: 328.

### Book 3:

Name: The Lord of Rings

Author: J.R.R Tolken.

Price: \$1000

No of pages: 1200.