1)a)import java.util.Scanner;

public class HelloWorld{

public static void main(String args[]){

System.out.println("AJAY N M");

System.out.println("1BM22CS026");

Scanner reader = new Scanner(System.in);

int number = reader.nextInt();

System.out.println("You entered :" +number);}

}

```
C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>javac helloworld.java

C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>java helloworld
AJAY.N.M
1BM22CS026
enter a new number : 5
you entered : 5
```

b)import java.util.Scanner;

public class JavaExample{

public static void main(String args[]){

System.out.println("AJAY N M");

System.out.println("1BM22CS026");

int num;

System.out.println("Enter an Integer number");

Scanner input = new Scanner(System.in);

num = input.nextInt();

if(num%2==0){

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

}

else{

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

}

}}

```
C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>javac javaexample.java

C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>java javaexample
AJAY.N.M
1BM22CS026
enter a integer:
5
 odd number
```

c)public class JavaExample {

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

System.out.println("AJAY N M");

System.out.println("1BM22CS026");

int row, column ,no_of_rows;

for(row=0;row<no_of_rows;row++){

for(column=0;column<rows;column++){

System.out.println("*");}}}}
```

```
C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>javac Star.java

C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>java Star
AJAY.N.M
1BM22CS026
*
**
***
****
*****
******
*******
********
```

```
d)public class JavaExample{

public static void main(String args[]){

System.out.println("AJAY N M");

System.out.println("1BM22CS026");

int num1=15,num2=2;

int Quotient =num1/num2;

int remainder=num1%num2;

System.out.println("Qutoient is" +Quotient);

System.out.println("Remainder is" +remainder);}}
```

```
C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>javac qr.java

C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>java qr
AJAY.N.M
1BM22CS026
quotient is:7
Remainder is:1
```

```
e)public class demo{

public static void main(String args[]){

System.out.println("AJAY N M");

System.out.println("1BM22CS026");

Scanner scan = new Scanner(System.in);

System.out.println("Enter first number");

int num1=scan.nextInt();

System.out.println("Enter second number");
```

int num2=scan.nextInt();

scan.close();

int product=num1*num2;

System.out.println("Output:"+product);}}

```
C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>javac multiply.java

C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>java multiply
AJAY.N.M
1BM22CS026
enter first number:
5
enter second number:
5
Output:25
```

f)public class swapnumbers{

public static void main(String args[]){

System.out.println("AJAY N M");

System.out.println("1BM22CS026");

float first =1.20f,second=2.45f;

System.out.println("—Before Swap—");

System.out.println("First number"+first);

System.out.println("Second number"+second);

Float temp=first;

first=second;

second=temp;

System.out.println("—After Swap—");

System.out.println("First number"+first);

System.out.println("Second number"+second);}}

```
C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>javac swap.java

C:\Users\REX LAPIS\Desktop\sem 3\OOJ\!1BM22CS026>java swap
AJAY.N.M
1BM22CS026
--before swap--
first number = 1.2
second number = 2.45
--after swap--
first number = 2.45
second number = 1.2
```

```java
2)import java.util.Scanner;

public class QuadraticSolver {

    public static void main(String[] args) {
System.out.println("AJAY N M");
System.out.println("1BM22CS026");
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the coefficients of the quadratic equation ax^2 + bx + c = 0:");
        System.out.print("Enter a: ");
        double a = scanner.nextDouble();
        System.out.print("Enter b: ");
        double b = scanner.nextDouble();
        System.out.print("Enter c: ");
        double c = scanner.nextDouble();
        double discriminant = b * b - 4 * a * c;
        if (discriminant > 0) {
            double root1 = (-b + Math.sqrt(discriminant)) / (2 * a);
            double root2 = (-b - Math.sqrt(discriminant)) / (2 * a);
            System.out.println("Real Solutions:");
            System.out.println("Root 1: " + root1);
            System.out.println("Root 2: " + root2);
        } else if (discriminant == 0) {
            double root = -b / (2 * a);
            System.out.println("Real Solution:");
            System.out.println("Root: " + root);
        } else {
            System.out.println("No real solutions exist for the given quadratic equation.");
        }
        scanner.close();
    }
```

```
┌──(rex⬡rex)-[~/Desktop/SEM 3/OOJ]
└─$ java qe
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
AJAY.N.M
1BM22CS026
Enter coefficients :
1
4
2
Roots are real
-0.58578646
-3.4142137
```

```
┌──(rex⬡rex)-[~/Desktop/SEM 3/OOJ]
└─$ java qe
Picked up _JAVA_OPTIONS: -Dawt.useSystemAAFontSettings=on -Dswing.aatext=true
AJAY.N.M
1BM22CS026
Enter coefficients :
2
4
2
Roots are real and equal
-1.0
```

3)import java.util.Scanner;

public class Student {

String usn;

String name;

private static int credit[] = {4,4,3,3,3,1,1,1};

int marks[] = new int [8];

Scanner s = new Scanner(System.in);

public void get_details()

{

System.out.println("Enter your USN:");

usn = s.next();

System.out.println("Enter your name:");

name = s.next();

}

public void set_marks()

{

System.out.println("Enter your marks in order");

for(int i=0;i<8;++i)

{

marks[i] = s.nextInt();

}

}

public double sgpa()

{
```

```java
                double sgpa=0,temp=0;

                    for(int i=0;i<8;++i)

                    {

                                temp+=credit[i]*((int)(marks[i]/10)+1);

                    }

                    sgpa= temp/20;

                    if(sgpa == 11)

                    {

                                return sgpa-1;

                    }

                    return sgpa;

                    }

            public void display()

                    {

                                System.out.println("Name: "+name);

                                System.out.println("USN: "+usn);

                                System.out.println("SGPA: "+sgpa());

                    }

    public static void main(String[] args) {

                                System.out.println("AJAY N M");

                    System.out.println("1BM22CS026");

                    Student s1 = new Student();

                    s1.get_details();

                    s1.set_marks();

                    s1.display();

            }

    }
```

```
C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>javac Student.java

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>java Student
AJAY N M
1BM22CS026
Enter your USN:
1BM22CS026
Enter your name:
AJAYNM
Enter your marks in order
81
78
64
58
63
66
69
74
Name: AJAYNM
USN: 1BM22CS026
SGPA: 7.5
```

```java
4)import java.util.Scanner;
class Books{
    String name;
    String author;
    int price;
    int num_pages;
    public void set(int i){
        Scanner in=new Scanner(System.in);
        System.out.println("Enter details of books "+(i+1)+" in name,author,price,num_pages order");
        name=in.next();
        author=in.next();
        price=in.nextInt();
        num_pages=in.nextInt();
    }
    public String toString() {
        return "Details of Book " + (i+1)+"\n"+
            "Name: " + name + "\n" +
            "Author: " + author + "\n" +
            "Price: " + price + "\n" +
            "No of pages: " + num_pages;
    }
}
class D {
    public static void main(String[] args) {
System.out.println("AJAY N M");
System.out.println("1BM22CS026");
        int n;
        Scanner in=new Scanner(System.in);
        System.out.println("Enter number of books");
        n=in.nextInt();
        Books b[]=new Books[n];
        for(int i=0;i<n;i++){
            b[i]=new Books();
            b[i].set(i);
        }
        System.out.println();
        for(int i=0;i<n;i++){
```

```
        System.out.println(b[i].toString());

    }

}
```

```
C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>javac D.java

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>java D
AJAY N M
1BM22CS026
Enter number of books
2
Enter details of books 1 in name, author, price, num_pages order
REX
Zhongli]
1000
989
Enter details of books 2 in name, author, price, num_pages order
Guizhong
xiaoyun
1500
600

Details of Book 1
Name: REX
Author: Zhongli]
Price: 1000
No of pages: 989
Details of Book 2
Name: Guizhong
Author: xiaoyun
Price: 1500
No of pages: 600

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>
```

```java
5)import java.util.Scanner;

abstract class Shape {

   protected int side1;

   protected int side2;


   public Shape(int side1, int side2) {

      this.side1 = side1;

      this.side2 = side2;

   }

   public abstract void printArea();

}


class Rectangle extends Shape {

   public Rectangle(int length, int width) {

      super(length, width);

   }


   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);

   }

   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, radius);

   }


   public void printArea() {
```

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

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

    }

}


public class Main {

    public static void main(String[] args) {

System.out.println("AJAY N M");

System.out.println("1BM22CS026");


        Scanner scanner = new Scanner(System.in);


        System.out.print("Enter length of Rectangle: ");

        int length = scanner.nextInt();

        System.out.print("Enter width of Rectangle: ");

        int width = scanner.nextInt();

        Rectangle rectangle = new Rectangle(length, width);

        System.out.print("Enter base of Triangle: ");

        int base = scanner.nextInt();

        System.out.print("Enter height of Triangle: ");

        int height = scanner.nextInt();

        Triangle triangle = new Triangle(base, height);

        System.out.print("Enter radius of Circle: ");

        int radius = scanner.nextInt();

        Circle circle = new Circle(radius);

        scanner.close();

        rectangle.printArea();

        triangle.printArea();

        circle.printArea();

    }
```

```
C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>javac Main.java

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>java Main
AJAY N M
1BM22CS026
Enter length of Rectangle: 5
Enter width of Rectangle: 4
Enter base of Triangle: 6
Enter height of Triangle: 3
Enter radius of Circle: 4
Area of Rectangle: 20
Area of Triangle: 9.0
Area of Circle: 50.26548245743669
```

```java
6)import java.util.Scanner;
class Account {
    String customerName;
    long accno;
    String accountType;
    double balance;
    public Account(String customerName, long accno, String accountType) {
        this.customerName = customerName;
        this.accno = accno;
        this.accountType = accountType;
        this.balance = 0.0;
    }
    public void displayBalance() {
        System.out.println("Account Number: " + accno);
        System.out.println("Customer Name: " + customerName);
        System.out.println("Account Type: " + accountType);
        System.out.println("Balance: $" + balance);
    }
}
class CurAcct extends Account {
    double minBalance;
    double serviceCharge;
    public CurAcct(String customerName, long accno) {
        super(customerName, accno, "Current");
        this.minBalance = 500.0; // Set minimum balance
        this.serviceCharge = 50.0; // Set service charge
    }
    public void withdraw(double amount) {
        if (balance - amount >= minBalance) {
            balance -= amount;
            System.out.println("Withdrawal successful. Current Balance: $" + balance);
        } else {
            System.out.println("Insufficient funds. Withdrawal not allowed.");
        }
    }
    public void imposeServiceCharge() {
        if (balance < minBalance) {
            balance -= serviceCharge;
```

```java
            System.out.println("Service charge imposed. Current Balance: Rs." + balance);

        }

    }

}

class SavAcct extends Account {

    double interestRate;


    public SavAcct(String customerName, long accno) {

        super(customerName, accno, "Savings");

        this.interestRate = 0.05;

    }


    public void depositInterest() {

        double interest = balance * interestRate;

        balance += interest;

        System.out.println("Interest deposited. Current Balance: $" + balance);

    }


    public void compoundInterest(double initialAmount, int term) {

        double compoundInterest = initialAmount * Math.pow((1 + interestRate), term) - initialAmount;

        balance += compoundInterest;

        System.out.println("Compound Interest deposited. Current Balance: Rs." + balance);

    }

}

public class Bank {

    public static void main(String[] args) {

System.out.println("AJAY N M");

System.out.println("1BM22CS026");

        Scanner scanner = new Scanner(System.in);

        System.out.println("Choose account type:");

        System.out.println("1. Current");

        System.out.println("2. Savings");

        System.out.print("Enter choice (1 or 2): ");

        int choice = scanner.nextInt();

        System.out.print("Enter customer name: ");

        String customerName = scanner.next();

        System.out.print("Enter account number: ");

        long accno = scanner.nextLong();
```

```java
        if (choice == 1) {

            CurAcct curAccount = new CurAcct(customerName, accno);

            System.out.print("Enter initial balance: $");

            double initialBalance = scanner.nextDouble();

            curAccount.balance = initialBalance;

            System.out.print("Enter withdrawal amount: $");

            double withdrawalAmount = scanner.nextDouble();

            curAccount.withdraw(withdrawalAmount);

            curAccount.imposeServiceCharge();

            curAccount.displayBalance();

        } else if (choice == 2) {

            SavAcct savAccount = new SavAcct(customerName, accno);

            System.out.print("Enter initial balance: $");

            double initialBalance = scanner.nextDouble();

            savAccount.balance = initialBalance;

            System.out.print("Enter withdrawal amount: $");

            double withdrawalAmount = scanner.nextDouble();

            savAccount.balance -= withdrawalAmount;

            System.out.println("Withdrawal successful. Current Balance: $" + savAccount.balance);

            System.out.print("Enter interest rate: ");

            double interestRate = scanner.nextDouble();

            savAccount.interestRate = interestRate;

            savAccount.displayBalance();

            System.out.print("Enter term (in years) for compound interest calculation: ");

            int term = scanner.nextInt();

            savAccount.compoundInterest(initialBalance, term);

            savAccount.displayBalance();

        } else {

            System.out.println("Invalid choice");

        }

    }

}
```

```
C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>javac Bank.java

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>java Bank
AJAY N M
1BM22CS026
Choose account type:
1. Current
2. Savings
Enter choice (1 or 2): 1
Enter customer name: AJAY
Enter account number: 12345
Enter initial balance: $1000000
Enter withdrawal amount: $6000
Withdrawal successful. Current Balance: $994000.0
Account Number: 12345
Customer Name: AJAY
Account Type: Current
Balance: $994000.0

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>java Bank
AJAY N M
1BM22CS026
Choose account type:
1. Current
2. Savings
Enter choice (1 or 2): 2
Enter customer name: AJAY
Enter account number: 12345
Enter initial balance: $1000000
Enter withdrawal amount: $50000
Withdrawal successful. Current Balance: $950000.0
Enter interest rate: 8
Account Number: 12345
Customer Name: AJAY
Account Type: Savings
Balance: $950000.0
Enter term (in years) for compound interest calculation: 10
Compound Interest deposited. Current Balance: $3.48678440095E15
Account Number: 12345
Customer Name: AJAY
Account Type: Savings
Balance: $3.48678440095E15
```

```java
7)package CIE;

import java.util.*;

public class Student
{
    // instance variables - replace the example below with your own
    public int sem;

    public String usn;

    public String name;


    public void accept()
    {
        Scanner scan = new Scanner(System.in);

        System.out.println("Enter U, N, S:\n");

        usn=scan.nextLine();

        name=scan.nextLine();

        sem=scan.nextInt();
    }
}
package CIE;


public class Internals
{
    public int im[]=new int[5];
}
package SEE;

import CIE.Student;

public class External extends Student
{
    // instance variables - replace the example below with your own
    public int sm[]=new int[5];
}
import java.util.*;

import SEE.*;

import CIE.*;

public class FinalMarks
{ public static void main(String args[])
    {System.out.println("AJAY N M");

System.out.println("1BM22CS026");
```

```java
    int fm[]=new int[5];

    Scanner sc= new Scanner(System.in);

    System.out.println("Enter n: ");

    int n=sc.nextInt();

    SEE.External st[]=new SEE.External[n];

    CIE.Internals s[]=new CIE.Internals[n];

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

    {

        st[i]=new SEE.External();

        s[i]=new CIE.Internals();

        System.out.println("Enter details "+(i+1));

        st[i].accept();

        for(int j=0; j<5; j++)

        {

            System.out.println("Enter im and sm of sub "+(j+1));

            s[i].im[j]=sc.nextInt();

            st[i].sm[j]=sc.nextInt();

            fm[j]=s[i].im[j]+st[i].sm[j];

        }

        System.out.println("Final marks of "+st[i].name);

        for(int k=0; k<5; k++)

        {

            System.out.println("Course "+(k+1)+" = "+fm[k]);

        }}}}
```

```
C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY\package>java Finalmarks
Enter n:
2
Enter details 1
Enter the details :

1BM22CS026
AJAYNM
3
Enter im and sm of sub 1
81
86
Enter im and sm of sub 2
75
64
Enter im and sm of sub 3
85
84
Enter im and sm of sub 4
80
85
Enter im and sm of sub 5
78
79
Final marks of AJAYNM
Course 1 = 167
Course 2 = 139
Course 3 = 169
Course 4 = 165
Course 5 = 157
```

```java
8)import java.util.Scanner;
class WrongAge extends Exception {
    public WrongAge(String message) {
        super(message);
    }
}
class Father {
    int fatherAge;
    public Father(int fatherAge) throws WrongAge {
        if (fatherAge < 0) {
            throw new WrongAge("Age cannot be negative");
        }
        this.fatherAge = fatherAge;
    }
}
class Son extends Father {
    int sonAge;
    public Son(int fatherAge, int sonAge) throws WrongAge {
        super(fatherAge);
        if (sonAge >= fatherAge) {
            throw new WrongAge("Son's age must be less than Father's age");
        }
        this.sonAge = sonAge;
    }
}
public class fatherson {
    public static void main(String[] args) {
System.out.println("AJAY N M");
System.out.println("1BM22CS026");
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter father's age and son's age: ");
        int fa=sc.nextInt();
        int sa=sc.nextInt();
        try {
            Son s = new Son(fa, sa);
            System.out.println("Father's age: " + s.fatherAge);
            System.out.println("Son's age: " + s.sonAge);
```

```java
        } catch (WrongAge e) {

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

        }

    }

}
```

```
C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>javac fatherson.java

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>java fatherson
AJAY N M
1BM22CS026
Enter father's age and son's age:
60
20
Father's age: 60
Son's age: 20

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>java fatherson
AJAY N M
1BM22CS026
Enter father's age and son's age:
20
60
Error: Son's age must be less than Father's age
```

```java
9)class A extends Thread
{
   int t1,time;
   A(){
      t1=10000;
      time=21000;
   }
   public void run()
   {
      while(t1<=time)
      {
         System.out.println("BMS COLLEGE OF ENGINEERING");
         try {
            sleep(10000);
         } catch(Exception e) {
            System.out.println("error");
         }
         t1+=10000;
      }}
}
class B extends Thread{
   int t2,time;
   B(){
      time=21000;
      t2=2000;
   }
   public void run()
   {
      while(t2<=time)

      {
         System.out.println("CSE");
         try{
            sleep(2000);
         }
         catch(Exception e)
         {
            System.out.println("error");
```

```
            }
        t2+=2000;

    }}
}

class th
{
    public static void main(String args[])
    { System.out.println("AJAY N M");

System.out.println("1BM22CS026");

        A a=new A();

        B b=new B();

        a.start();

        b.start();

    }
}
```

```
C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>javac th.java

C:\Users\REX LAPIS\Desktop\1BM22CS026_AJAY N M>java th
AJAY N M
1BM22CS026
BMS COLLEGE OF ENGINEERING
CSE
CSE
CSE
CSE
CSE
BMS COLLEGE OF ENGINEERING
CSE
CSE
CSE
CSE
CSE
```

```java
10)import javax.swing.*;

import java.awt.*;

import java.awt.event.*;

class SwingDemo{

SwingDemo(){

JFrame jfrm = new JFrame("Divider App");

jfrm.setSize(275, 150);

jfrm.setLayout(new FlowLayout());

jfrm.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

JLabel jlab = new JLabel("Enter the divider and divident:");

JTextField ajtf = new JTextField(8);

JTextField bjtf = new JTextField(8);

JButton button = new JButton("Calculate");

JLabel err = new JLabel();

JLabel alab = new JLabel();

JLabel blab = new JLabel();

JLabel anslab = new JLabel();

jfrm.add(err);

jfrm.add(jlab);

jfrm.add(ajtf);

jfrm.add(bjtf);

jfrm.add(button);

jfrm.add(alab);

jfrm.add(blab);

jfrm.add(anslab);

ActionListener l = new ActionListener() {

public void actionPerformed(ActionEvent evt) {

System.out.println("Action event from a text field");

}

};

ajtf.addActionListener(l);

bjtf.addActionListener(l);

button.addActionListener(new ActionListener() {

public void actionPerformed(ActionEvent evt) {

try{

int a = Integer.parseInt(ajtf.getText());

int b = Integer.parseInt(bjtf.getText());

int ans = a/b;
```

```java
alab.setText("\nA = " + a);

blab.setText("\nB = " + b);

anslab.setText("\nAns = "+ ans);

}

catch(NumberFormatException e){

alab.setText("");

blab.setText("");

anslab.setText("");

err.setText("Enter Only Integers!");

}

catch(ArithmeticException e){

alab.setText("");

blab.setText("");

anslab.setText("");

err.setText("B should be NON zero!");

}

}

});

jfrm.setVisible(true);

}

public static void main(String args[]){

SwingUtilities.invokeLater(new Runnable(){

public void run(){

new SwingDemo();

}});}}
```