1)a)import java.util.Scanner;

public class HelloWorld{

public static void main(String args[]){

System.out.println(“Akshata Hosmani”);

System.out.println(“1BM22CS031”);

Scanner reader = new Scanner(System.in);

int number = reader.nextInt();

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

}

```
C:\Users\aksha\Downloads\java>javac HelloWorld.java

C:\Users\aksha\Downloads\java>java HelloWorld
Akshata Hosmani
1BM22CS031
2
You entered :2
```

b)import java.util.Scanner;

public class JavaExample{

public static void main(String args[]){

System.out.println(“Akshata Hosmani”);

System.out.println(“1BM22CS031”);

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\aksha\Downloads\java>javac JavaExample.java

C:\Users\aksha\Downloads\java>java JavaExample
Akshata Hosmani
1BM22CS031
Enter an Integer number
23
23is odd number

C:\Users\aksha\Downloads\java>
```

c)public class JavaExample {

public static void main(String args[]){

System.out.println(“Akshata Hosmani”);

System.out.println(“1BM22CS031”);

int row, column ,no_of_rows;

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

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

System.out.println(“*”);}}}}

d)public class JavaExample{

public static void main(String args[]){

System.out.println(“Akshata Hosmani”);

System.out.println(“1BM22CS031”);

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\aksha\Downloads\java>javac JavaExample2.java

C:\Users\aksha\Downloads\java>java JavaExample2
Akshata Hosmani
1BM22CS031
Qutoient is7
Remainder is1
```

e)public class demo{

public static void main(String args[]){

System.out.println(“Akshata Hosmani”);

System.out.println(“1BM22CS031”);

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\aksha\Downloads\java>java demo.java
Akshata Hosmani
1BM22CS031
Enter first number
2
Enter second number
3
Output:6
```

f)public class swapnumbers{

public static void main(String args[]){

System.out.println(“Akshata Hosmani”);

System.out.println(“1BM22CS031”);

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\aksha\Downloads\java>javac swapnumbers.java

C:\Users\aksha\Downloads\java>java swapnumbers.java
Akshata Hosmani
1BM22CS031
--Before Swap--
First number1.2
Second number2.45
--After Swap--
First number2.45
Second number1.2
```

2)

```
import java.util.Scanner;


public class QuadraticSolver {


    public static void main(String[] args) {
System.out.println(“Akshata Hosmani”);
System.out.println(“1BM22CS031”);
        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();
  }
```

```
C:\Users\aksha\Downloads>java Qe
Akshata Hosmani
1BM22CS031
Enter the coefficients of the quadratic equation (a, b, c):
10
6
4
The roots of the equation are complex and distinct:
Root 1: -0.3 + 0.5567764362830021i
Root 2: -0.3 - 0.5567764362830021i

C:\Users\aksha\Downloads>javac Qe.java

C:\Users\aksha\Downloads>java Qe
Akshata Hosmani
1BM22CS031
Enter the coefficients of the quadratic equation (a, b, c):
2
4
5
The roots of the equation are complex and distinct:
Root 1: -1.0 + 1.2247448713915890i
Root 2: -1.0 - 1.2247448713915890i
```

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()
        {
            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(“Akshata Hosmani”);
            System.out.println(“1BM22CS031”);
                Student s1 = new Student();
                s1.get_details();
                s1.set_marks();
                s1.display();
        }
}
```

```
C:\Users\aksha\Downloads>javac marks.java

C:\Users\aksha\Downloads>java marks
Akshata Hosmani
1BM22CS031
Enter your USN
cs031
Enter your Name
Akshata
Enter your Marks
76
67
89
98
56
65
90
89
Name:Akshata
USN:cs031
SGPA:2.696825396825397
```

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(“Akshata Hosmani”);
System.out.println(“1BM22CS031”);
      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\aksha\Downloads>javac Main.java

C:\Users\aksha\Downloads>java Main
Akshata Hosmani
1BM22CS031
Enter the number of books you want to generate 2

Enter details for Book 1:
Name: XYZ
Author: Shakesphere
Price: 100
Number of Pages: 50

Enter details for Book 2:
Name: ABC
Author: Henry
Price: 200
Number of Pages: 60

Details of all books:
Book Details:
Name: XYZ
Author: Shakesphere
Price: $100.0
Number of Pages: 50

Book Details:
Name: ABC
Author: Henry
Price: $200.0
Number of Pages: 60
```

```
}
```

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() {
        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(“Akshata Hosmani”);
System.out.println(“1BM22CS031”);

      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\aksha\Downloads>javac Shape.java

C:\Users\aksha\Downloads>java Shape
Akshata Hosmani
1BM22CS031
Enter radius of the circle
4
The area of the circle is 50.24
Enter base and height of the triangle
3
4
The area of the triangle is 6.0
Enter length and breadth of the rectangle
4
5
The area of the rectangle is 20
```
}

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;
            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(“Akshata Hosmani”);
System.out.println(“1BM22CS031”);
        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();
        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\aksha>cd downloads

C:\Users\aksha\Downloads>javac Bank.java

C:\Users\aksha\Downloads>java Bank
Akshata Hosmani
1BM22CS031
Choose account type:
1. Current
2. Savings
Enter choice (1 or 2): 1
Enter customer name: Akshata
Enter account number: 12345
Enter initial balance: $50000
Enter withdrawal amount: $2000
Withdrawal successful. Current Balance: $48000.0
Account Number: 12345
Customer Name: Akshata
Account Type: Current
Balance: $48000.0

C:\Users\aksha\Downloads>javac Bank.java

C:\Users\aksha\Downloads>java Bank
Akshata Hosmani
1BM22CS031
Choose account type:
1. Current
2. Savings
Enter choice (1 or 2): 2
Enter customer name: Akshata
Enter account number: 12333
Enter initial balance: $278000
Enter withdrawal amount: $40000
Withdrawal successful. Current Balance: $238000.0
Enter interest rate: 7
Account Number: 12333
```

}

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("Akshata Hosmani");
System.out.println("1BM22CS031");
        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:\Example>javac FinalMarks.java

C:\Example>java FinalMarks
Akshata Hosmani
1BM22CS031
Enter n:
1
Enter details 1
Enter U, N, S:

cs031
ABS
3
Enter im and sm of sub 1
98
99
Enter im and sm of sub 2
89
100
Enter im and sm of sub 3
80
70
Enter im and sm of sub 4
90
78
Enter im and sm of sub 5
89
90
Final marks of ABS
Course 1 = 197
Course 2 = 189
Course 3 = 150
Course 4 = 168
Course 5 = 179
```

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(“Akshata Hosmani”);
System.out.println(“1BM22CS031”);
        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);
        } catch (WrongAge e) {
            System.out.println("Error: " + e.getMessage());
        }
```

```
    }
```

```
Microsoft Windows [Version 10.0.22631.3085]
(c) Microsoft Corporation. All rights reserved.

C:\Users\aksha>cd downloads

C:\Users\aksha\Downloads>javac fatherson.java

C:\Users\aksha\Downloads>java fatherson
Akshata Hosmani
1BM22CS031
Enter father's age and son's age:
56
23
Father's age: 56
Son's age: 23
}
```

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(“Akshata Hosmani”);
System.out.println(“1BM22CS031”);
        A a=new A();
        B b=new B();
        a.start();
        b.start();
    }
```

```
Microsoft Windows [Version 10.0.22631.3085]
(c) Microsoft Corporation. All rights reserved.

C:\Users\aksha>cd downloads

C:\Users\aksha\Downloads>javac th.java

C:\Users\aksha\Downloads>java th
Akshata Hosmani
1BM22CS031
BMS COLLEGE OF ENGINEERING
CSE
CSE
CSE
CSE
CSE
BMS COLLEGE OF ENGINEERING
CSE
```

```
}
```

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");

}

};

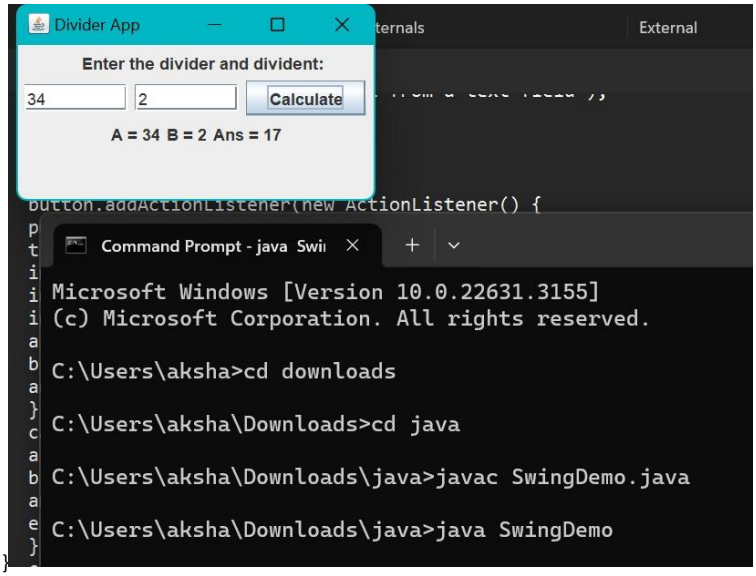
ajtf.addActionListener(l);

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;
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();
}
});
}
```


Divider App
Enter the divider and divident:
34
2
Calculate
A = 34 B = 2 Ans = 17
ternals
External
Command Prompt - java Swii
Microsoft Windows [Version 10.0.22631.3155]
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C:\Users\aksha>cd downloads
C:\Users\aksha\Downloads>cd java
C:\Users\aksha\Downloads\java>javac SwingDemo.java
C:\Users\aksha\Downloads\java>java SwingDemo