

1. Create a class book that contains 4 members: name, author, price & num-pages. Include a constructor to set the values for the members. Include methods to set and get the details of the objects. Include a `toString()` method that could display the complete details of the book. Develop a Java program to create n book objects.

Ans

```
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 toString()

```
{ String name, author;
```

~~String price, NumPages;~~

~~name = "Book name: " + this.name + "\n";~~

~~author = "Author name: " + this.author + "\n";~~

~~price = "Price: " + this.price + "\n";~~

~~NumPages = "Number of Pages: " + this.NumPages~~
~~+ "\n";~~

Class main

```
{ public static class main (String args[])
{ Scanner s = new Scanner (System. in);
int n;
String name;
String author;
int price;
int numPages;
System.out.println ("Enter the no. of books");
n = s.nextInt ();
Books b [];
b = new Books [n];
for (int i = 0; i < n; i++)
{ System.out.println ("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 lgs ");
numPages = s.nextInt ();
b[i] = new Books (name, author, price, numPages);
}
for (int i = 0; i < n; i++)
System.out.println ("Book " + (i + 1) + " (" + b[i] + ")");
```

OUTPUT:

Enter the name of books : 2

Book 1:

Enter name : Jungle Book

Enter author : Rudyard Kipling

Enter Price : 1000

Enter Number of Pages : 500

Book 2 :

Enter name : Tales of akbar and birbal

Enter author : Babel

Enter price : 900

Enter number of Pages : 400

Book 1 :

Book name : Jungle Book

Author name : Rudyard Kipling

Price : 1000

Number of Pages : 500

Book 2 :

Book name : Tales - of - akbar and - birbal

Author name : Babel

Price : 900

No. of Pages : 400

2. Write a JAVA prog to create a class Student with members USN, Name, marks[6] sub). Include methods to accept student details and marks. Also include a method to calculate the % & display the details.

```
import java.util.Scanner;  
class Student {  
    String USN;  
    String Name;  
    int marks[] = new int[6];  
  
    void details()  
    { Scanner s = new Scanner(System.in);  
        System.out.println("Enter USN");  
        USN = s.next();  
        System.out.println("Enter name");  
        Name = s.next();  
        System.out.println("Enter marks (6 sub)");  
        for (int i = 0; i < 6; i++)  
        { System.out.println("Subject " + (i + 1));  
            marks[i] = s.nextInt();  
        }  
    }  
  
    double percentage()  
    { int total = 0;  
        for (int i = 0; i < 6; i++)  
        { total += marks[i];  
        }  
        double p = total / 6;  
        return p;  
    }
```

```
void display ()  
{  
    System.out.println ("In Student Details");  
    System.out.println ("USN" + USN);  
    for (int i = 0; i < 6; i++)  
    {  
        System.out.println ("Name " + name);  
        System.out.println ("Marks");  
        for (int i = 0; i < 6; i++)  
        {  
            System.out.println ("Subject" +(i+1) + ":" +  
                marks[i]);  
        }  
        System.out.println ("Percentage" + Percentage);  
    }  
}
```

Class ~~Std~~ Student

```
{  
    public static void main (String args [] ) {  
        Scanner s = new Scanner (System.in);  
        System.out.println ("Enter no. of students");  
        int n = s.nextInt ();  
        Student [] students = new Student [n];  
        for (int i = 0; i < n; i++)  
        {  
            students [i] = new Student ();  
            I.O.Pln ("Enter details" +(i+1) + ":" );  
            students [i].details ();  
        }  
    }  
}
```

```
for (Student student : students)  
{  
    student.display ();  
}
```

2

3

OUTPUT:

Enter details of student :

Enter VSN : 1234

Enter name : Rigo

Enter marks (6 subjects) :

Subject 1 : 23

" " 2 : 45

" " 3 : 90

" " 4 : 80

" " 5 : 156

" " 6 : 63

SSO

8/1/2024.

3. Quadratic Equations

```

import java.util.Scanner;
import java.util.Math;
class quadratic
{
    public static void main (String arg[])
    {
        int a, b, c;
        System.out.println ("Enter values of
            3 integers");
    }
}

```

Scanner sc = new Scanner (System.in);

a = sc.nextInt();

b = sc.nextInt();

c = sc.nextInt();

Equation eq = New Equation (a, b, c);

eq.quod();

Class Equation

```
{ -int a, b, c;
```

Equation (int a, int b, int c);

{ a = x;

b = y;

c = z; }

quod()

{ if (a = 0)

System.out.println ("Not quod q");

else if (a > 0)

{ Sopln ("2 real & diff solns");

double r1 = -b + math.

sqr (c)/ (2+a));

double r2 = -b - math.

sqr (r1);

4.

Solve (λ_2):

```

else if (d == 0)
{
    SOP ("Roots same roots");
     $\lambda_1 = -b + \sqrt{d / (2 * a)}$ ;
     $\lambda_2 = -b - \sqrt{d / (2 * a)}$ ;
    sop ( $\lambda_1$ );
    sop ( $\lambda_2$ );
}

```

```

else if (c * d < 0)
{
    SOP ("Imaginary Roots");
    if (c > 0)
        cout << "Roots are imaginary";
    else
        cout << "Roots are real";
}

```

OUTPUT:

Enter the values of a, b, c

2

3

2

Imaginary Solutions

✓ brief

4. abstract class Shape {
 int a;
 int b;
public shape (int a, int b) {
 this.a = a;
 this.b = b;
}
abstract void printarea();

Class Rectangle extends Shape {
public Rectangle (int l, int w) {
 super(l, w);

 public void printarea () {
 int area = a * b;
 SOP ("Area is: " + area);
 }

Class Triangle extends Shape {
public triangle (int b, int h) {
 super(b, h);

 public void printarea () {
 double area = 0.5 * a * h;
 SOP ("Area is: " + area);
 }

Class Circle extends Shape {
public Circle (int r, 0) {
 super(r, 0);

public void printarea()

$$\text{double area} = 3.14 * \pi * r^2;$$

SOP ("Area is : " + area);

3

3

public class main {

public static void main (String args [])

Rectangle rect = new Rectangle (4,5);

rect.printarea();

Triangle tri = new Triangle (3,6);

tri.printarea();

Circle cir = new Circle (7);

cir.printarea();

3

3

OUTPUT:

area is : 20.

area is : 9.

area is : 153.86

5.

Accounts

class Bank {

```
public static void main (String [] args) {  
    Savacc sa = new Savacc ("Pun", "1111");  
    Curacc ca = new Curacc ("Sham", "4444");
```

Savacc.display();

Savacc.deposit(5000);

Savacc.computeInterest();

Savacc.withdraw();

Curacc.deposit(8000);

Curacc.display();

Curacc.withdraw(5000);

Curacc.display();

class Account {

protected String name;

protected String accno;

protected double balance;

public account (String name, String accno)

{ this.name = name;

this.accno = accno;

this.balance = 0; }

public void deposit (double amt) {

balance = balance + amount; }

SOP ("Deposit is :" + amt);

public void display() {

SOP ("Account number " + accno);

}

}

class Savings extends account {

public savings (String name, String accno) {

{ super (name, accno); }

}

public void computeInterest () {

double interestRate = 0.05;

double interest = balance * interestRate;

balance = balance + interest;

SOP ("Interest is " + interest);

}

public void withdraw (double amt) {

if (balance >= amt)

{ balance = balance - amt; }

SOP ("Withdraw successful");

else

{ SOP ("Insufficient funds"); }

}

}

}

class Current extends account {

private double minBalance = 100.0;

public Current (String name, String accno) {

{ super (name, accno); }

private void public void withdraw (double amt) {
If (balance - amount >= minBalance) {
Balance = Balance - amt;

3 SOP ("Withdraw successful");

else {

1 SOP ("Insufficient funds");
impose service charge ();

public private void imposeCharge () {

double ~~service~~ slorg = 20;

balance -= slorg;

SOP ("Service Charge "+ slorg +
" imposed");

↳

O/P

Q8

22/11/24. output:

Deposit : 8000.00 successful

Ac no: SA1001

Balance : 8000.0

Interest of 256.0 computed & added

Ac No: SA1001

Balance : 8256.0

6. PACKAGES

CIE → Student.java & Internals.java
SEE → External.java
outside the folders Main.java

Student.java -

Package CIE;

Public class Student {

 Public String name;

 Public String USN;

 Public String int sem;

}

Internals.java

Package CIE;

Public class Internals extends Student {

 Public int [] marks = new int [5];

}

External.java

Package SEE;

import CIE.Student;

Public class External extends Student {

 Public int [] SEEmarks = new int [5];

}

Main.java

Import CIE.Internals;

Import SEE.External;

Import java.util.Scanner;

Public class Main {

 Psvm (String [] args) {

 SOP ("Enter the no. of Students");

Scanner Input = new Scanner (System.in);
int n = input.nextInt();

Internals [] S1 = new Internals [n];
Externals [] S2 = new Externals [n];
int [] finalDF = new int [n];
int [] finalSF = new int [n];

for (int i = 0; i < n; i++)
{ S1[i] = new Internals ();
SOPln ("Enter name");
S1[i].name = input.next();
SOPln ("Enter USN");
S1[i].USN = input.next();
SOPln ("Enter Sem");
S1[i].Sem = input.nextInt();
SOPln ("Enter the marks of 5 sub");
for (int j = 0; j < 5; j++)
{ S1[i].marks[j] = input.nextInt();
finalDF[i] += S1[i].marks[j];
}

for (int i = 0; i < n; i++)
{ S1[i] = new Externals ();
SOP ("Enter name");
:

SOP ("Final Marks.");

for (int i = 0; i < 5; i++)
SOP ("Name: " + S1[i].name +
"USN: " + S1[i].USN +

"Sem:" + ST[i] + Sem),

SOP ("Internals marks:" + final LIE[i]),
SOP ("External marks:" + final SEEPLi),
SOP ("Total marks:" + (final QBLi) + final SGLi),
}
}
}

OUTPUT:

Enter no. of Students

1

Enter name

Jay

Enter USN

089

Enter Sem

III

Enter marks of 5 sub

20

20

20

20

Enter name

Jay

Enter USN

089

Enter Sem

III

Enter marks of 5 sub

10

10

10

10

10

Final Marks:

Name: Tay USN: 089 Sem: 3

Internal Marks: 100

External " " : 50

Total Marks: 150

7. EXCEPTION

19. 2. 24

class WrongAge extends Exception {

public WrongAge (String message) {
super (message);

}

}

class Father {

int age;

public Father (int age) throws WrongAge,
if (age < 0) {

throw new WrongAge ("Age not nega-

3

this . age = age;

3

public int getAge () {

return age;

3

3

class Son extends Father {

int sonAge;

public Son (int FatherAge, int SonAge)

throws WrongAge {

super (FatherAge);

if (SonAge >= FatherAge) {

throw new WrongAge ("Sons age can't be > or
= father's age");

3

this . SonAge = SonAge;

3

public int getSonAge () {

return SonAge;

3

3

public class Main {

 PSVM (String [] args) {

 try {

 Father father = new Father(78);

 SOP ("Father's Age : " + father.getAge());

 Son son = new Son(78, 40);

 SOP ("Son's Age : " + son.getSonAge());

 }

 SOP ("Exception Caught : " + e.getMessage());

}
35

OUTPUT:

Father's Age : 78

Son's Age : 40

8. THREAD

19.2.24

Class DispMsg extends Thread {

String msg;
int interval;

public DispMsg (String msg, int interval);
this.msg = msg;
this.interval = interval;

public void run () {
while (true) {
System.out.println (msg);
try {

Thread.sleep (interval);

} catch (Exception e) {

e.printStackTrace ();

}

}

public class Main {

public static void main (String [] args) {

DispMsg bmsThread = new DispMsg ("BMSCE", 1000);

CSEThread = new DispMsg ("CSE", 2000);

bmsThread.start ();

cseThread.start ();

}

OUTPUT:

BMSCE

CSE

CSE

CSE

CSE → BMSCE → CSE → CSE → CSE

9. AWT

- Creating using import import multi

9. AWT

Date: _____

Page: _____

1. Creating label, button, textfield in a Frame using AWT.

```
import java.awt.*;  
import java.awt.event.*;  
public class AWT extends WindowAdapter {  
    Frame f;  
    AWT example () {  
        f = new Frame ();  
        f.addWindowListener (this);  
        label l = new Label ("Employee ID:");  
        button b = new Button ("Submit");  
        textfield t = new JTextField ();  
        l.setBounds (20, 80, 80, 30);  
        t.setBounds (20, 100, 80, 30);  
        l.setBounds (100, 100, 80, 30);  
        f.add (b);  
        f.add (l);  
        f.add (t);  
        f.setSize (400, 300);  
        f.setTitle ("Employee Title");  
        f.setLayout (null);  
        f.setVisible (true);  
    }  
}
```

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

```
public static void main (String [] args) {  
    AWT Example awtObj = new AWTExample();  
}
```

3

3

2) Create a button and add a action listener for Mouse click.

```
import java.awt.*;  
import java.awt.event.*;  
public class EventHandling extends WindowAdapter implements ActionListener {  
    Frame f;  
    Pointfield pf;  
    EventHandling () {  
        f = new JFrame();  
        f.addWindowListener (this);  
        if (f instanceof Pointfield) {  
            pf = (Pointfield) f;  
            pf.setBounds (60, 50, 170, 20);  
            JButton b = new JButton ("Click me");  
            b.setBounds (100, 120, 80, 30);  
            b.addActionListener (this);  
            pf.add (b); f.add (pf);  
            f.setSize (300, 300);  
            f.setLayout (null);  
            f.setVisible (true);  
        }  
    }  
}
```

```
public void actionPerformed (ActionEvent)  
{ pf.setLayout ("Welcome"); }
```

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

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

}

3

Programs on IO

1. import java.io.*;
public class ByteArrayInput {
 public static void main (String [] args)
 throws IOException {
 byte [] buf = {35, 36, 37, 38};
 Byte Array Input Stream byt = new BAI (buf);
 int k = 0;
 while (k = byt.read ()) b = -1);
 char ch = (char) k;
 System.out.println ("ASCII value of char is " + k);
 System.out.println ("Special char is " + ch);
 }
}

3

3

2. import java.io.*;
public class Byte Array Input {
 public static void main (String [] args) throws IOException {
 byte [] buf = {35, 36, 37, 38};
 Byte Array Input Stream byt = new BAI (buf);
 int k = 0;
 while (k = byt.read ()) b = -1);
 char ch = (char) k;
 System.out.println ("ASCII value of char is " + k);
 System.out.println ("Special char is " + ch);
 }
}

~~QUESTION~~

3. public class FileEx2 {

*PSVM (String args[]) throws IOException
file Input Stream fin = new fileInputStream ("Example.txt");

(^{“Example.txt”});

int Content;

SOP ("Remaining bytes that can be read",
fin.available());

Content = fin.read();

SOP ((char) Content + " ");

SOP (Content + " ");

- SOP (" Remaining bytes that can be
read": + fin.available());

SOP (" Read ",);

3

3

4. import java.io.FileInputStream;

import java.io.IOException;

public class FileEx2 {

*PSVM (String args[]) throws IOException
file Input Stream fin = new FileInputStream ("Example.txt");

byte b[2] bytes = new byte [20];

int i;

~~for (i=0; i<20; i++)~~ Chor ();

i9 = fin.read (bytes);

SOP (" No. of bytes read " + i9);

SOP (" Bytes read : ");

for (byte b: bytes) {

c = (Chor) b;

SOP (c);

3

3