

Lab - I

- ① Write a program to print "Hello World"
- ② Write a program to add, Subtract, Multiply and Divide 2 numbers
- ③ Write a program to find n^{th} Fibonacci number
- ④ Write a program to find a given number is prime or not

Sav Accr Savings Account → new Sav Accr(

• John Doe, 123456789, 1000.0,

curr Accr current account → new curr Accr ("Bank Rec")

1000.0, 2000.0, 500.0, 500

System.out.println("Savings");

savings account . displayBalance();

savings account . deposit(500.0);

savings account . depositInterest(5.0);

savings account . withdraw(200.0);

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

current Account . displayBalance();

current Account . deposit(1000.0);

current Account . withdraw(800.0);

current Account . checkMinimumBalance();

scanner.nextLine();

f

O/P

Saving Acc:

Balance 1000.0

Enter amt to be deposited

250

Balance 1250.0

Enter rate: 8

Balance 1296.0

① Hello World

class Example {

 public static void main(String args[]) {

 System.out.println("Hello World");

 }

}

Output: Hello world

② Addition, Sub, Mult, division

class Arithmetic {

 int a;

 int b;

 void set_value(int x, int y) {

 a = x;

 b = y;

}

 void Addition() {

 System.out.println(a+b);

}

 void Subtraction() {

 System.out.println(a-b);

}

 void Multiplication() {

 System.out.println(a*b);

}

 void Division() {

 System.out.println(a/b);

)

Enter amount to be withdrawn

670

Balance : 621.0

Curent Acc:

Balance : 2006.0

Amt to be deposited: 0

Balance : 460

Amt to withdraw: 1600

~~Service charge~~

Balance : 35.

8
22/11/24

{ else

System.out.println("No intent");

}

{

public void withdraw(double amt){

if (amt < balance){

balance -= amt;

System.out.println(balance);

{ else{

System.out.print("Insufficient funds for withdraw");

{

{

class SavAcct extends Account{

public SavAcct(String custName, long accountNumber, double balance){

super(custName, accountNumber, balance);

{

class CurrAcct extends Account{

double minBalance;

double serviceChrg;

public CurrAcct(String custName, long accountNumber, double balance, double

minBalance, double serviceChrg){

}

super(customerName, accountNumber, "curr", balance);
this.minBalance = minBalance;
this.serviceCharge = serviceCharge;

public void withdraw(double amount) {

if (curr < balance - minBalance) {
balance -= amount;

System.out.println(balance);

} else {

System.out.println("Insufficient funds for
withdrawal. Minimum balance
required");

public void checkMinBalance() {

if (balance < minBalance)

balance -= serviceCharge;

System.out.println(balance);

public class Bank {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in)

class Example2

```

public static void main(String args[]){
    Arithmetic a1 = new Arithmetic();
    a1.set_value(2,2);
    a1.Addition();
    a1.Subtraction();
    a1.Multiplication();
    a1.Division();
}

```

Output: 4, 0, 4; I

③ Fibonacci Series

```

public class FibonacciSeries {
    public static void main(String args[]){
        int n = 10;
        int firstTerm = 0, secondTerm = 1;
        for(int i=1; i<=n; i++){
            System.out.println(firstTerm + ", ");
            int nextTerm = firstTerm + secondTerm;
            firstTerm = secondTerm;
            secondTerm = nextTerm;
        }
    }
}

```

Output: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34

Prime

```
public class PrimeNumbers {  
    public static void main (String args[]){  
        for (int i=2; i<1000; i++){  
            if (isPrime(i)){  
                System.out.print (i + " ");  
            }  
        }  
    }  
}
```

```
public static boolean isPrime (int number){
```

```
    if (number <= 1){  
        return false;  
    }
```

```
    for (int i=2; i<=Math.sqrt(number); i++){  
        if (number % i == 0){  
            return false;  
        }  
    }  
    return true;  
}
```

Output: 2, 3, 5, 7

```
for(i=1; i<n; i++)  
    system.out.println(" " + i + b[i]);
```

{ } { }

Output:

Enter the number of book : 2

Book 1.

Enter the name of the book : Jungle Book

Enter the author of book : Kipling

Enter price of book : 1000

Enter the no of pages of book : 500

Book 2.

Enter the name of book : Atomic Habit

Enter the auth of book : James Clear

Enter price of book : 400

Enter the no of pages of book : 200

Q

Book 1:

Book name: Jungle Book

author: Kipling

Price : 1000

no of Pages: 500

Book 2:

Book name : Atomic Habit

author : James Clear

Price : 400

no of Pages: 200

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

```
public static void main(String args[]) {  
    ANTR example obj = new ANTR();  
}
```

O/P

Employee id

123	Submit
-----	--------

D) Drawing label, button and TextField 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();

t.setBounds(20, 80, 80, 30);

t.setBounds(20, 100, 80, 30);

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

f.add(b);

f.add(l);

f.add(t);

f.setSize(400, 200);

f.setTitle("Employee info");

f.setLayout(null);

f.setVisible(true);

}

O/P BMS College of Engineering

CSE

CET

CSE

CSE

CSC

BMS College of Engineering

CSE

CSE

CSE

CSE

CSE

(S8)

~~2. 12^a~~

(g) 12^a

class DisplayMessage extends Thread {
 private String message;
 private int interval;

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

this.message = message;
 this.interval = interval;

public void run() {
 while(true) {

System.out.println(message);

try {

Thread.sleep(interval * 1000);

} catch (InterruptedException e) {

e.printStackTrace();

}

}

public class Main {

public static void main(String[] args) {

~~DisplayMessage thread1 = new DisplayMessage(~~

~~"BITS College of Engineering", 10);~~

~~DisplayMessage thread2 = new DisplayMessage(~~

~~"CSE", 2);~~

thread1.start();

thread2.start();

}

① Develop a Java program to create a Java Bank that maintains two kinds of account for its customer, one called savings account other current account. The savings account provides compound interest and withdrawal facilities.

- a) Accept deposit from customer and update the balance
- b) Display the balance
- c) Compute and deposit interest
- d) Permit withdrawal and update the balance

import java.util.Scanner;

class Account {

 String customerName
 long accountNumber,
 String accountType;
 double balance;

 public Account(String customerName, long accountNumber, String accountType, double balance){
 this.customerName = customerName;
 this.accountNumber = accountNumber;
 this.accountType = accountType;
 this.balance = balance;
 }

 public void deposit(double amt){
 balance += amount;

 System.out.println("Balance");

 public void displayBalance(){

 System.out.println("Account Number");

 public void depositInterest(double rate){
 if(Savings.equals(accountType)){

 double interest = balance * rate / 100;

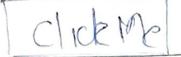
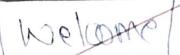
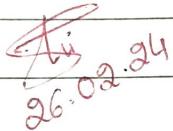
 balance += interest;

 System.out.println("Balance");

```
public void windowClosing (WindowEvent e) {  
    System.out.println();  
}
```

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

O/P

A rectangular button labeled "click Me".A rectangular button labeled "Welcome". A red curved arrow points from the "click Me" button to the "Welcome" button.
26.02.94

abstract class Shape {

 public int dim1;

 public int dim2;

 public Shape(int dim1, int dim2)

 this.dim1 = dim1;

 this.dim2 = dim2;

}

abstract void printArea();

class Rectangle extends Shape {

 public Rectangle(int len, int width) {

 super(len, width);

}

void printArea()

 int area = dim1 * dim2;

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

}

}

class Triangle ~~extends Shape~~ {

 public Triangle(int base, int height) {

 super(base, height);

}

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;  
TextField tf;  
EventHandling()
```

```
f = new Frame();  
f.addWindowListener(this);  
tf = new TextField();  
tf.setBounds(60, 50, 170, 20);  
Button b = new Button("click me");  
b.setBounds(110, 120, 90, 30);
```

```
b.addActionListener(this);
```

```
f.add(b); f.add(tf);  
f.setSize(300, 300);  
f.setDefaultCloseOperation(null);  
f.setVisible(true);
```

{

~~public void actionPerformed(ActionEvent e){~~
~~tf.setText("Welcome");~~

{

```
void printArea()
```

double area = PI * dim1 * dim2;

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

```
class Circle extends Shape
```

```
public Circle (int radius){  
    super(radius, 0)}
```

```
void printArea()
```

double area = PI * dim1 * dim2;

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

```
public class Main
```

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

Rectangle r = new Rectangle(5, 0)

Triangle t = new Triangle(5, 8)

Circle c = new Circle(4)

r.printArea();

t.printArea();

c.printArea();

Q ✓

Area of Rectangle: 50

Area of Triangle: 20.0

Area of Circle: 50.26

O/P Enter no of Students: 3

Enter details of Student 1:

Enter the name: Aditya

Enter the USN: 1RM22CS111

Enter 6 marks: 45 66 90 85 71 99

Enter details of student 2:

Enter details of student 2:

Enter the name: Roshan

Enter the USN: 1RM22CS001

Enter 6 marks: 49 60 98 100 99

~~Enter~~ Enter details of Student 3:

Enter the name: Rahul

Enter the USN: 1RM22FS010

Enter 6 marks: 50 60 70 80 90 95

Student Details are:

Name of student: Aditya

USN of student 1: 1RM22CS067

The percentage is 85.055%.

Name of Student 2: Roshan

USN of student 2: 1RM22CS001

The percentage is 90.45%.

Name of student 3: Rahul

USN of student 3: 1RM22FS010

The percentage is 85.36%.

O/P

Father's Age : 50

Son's age : 25

(R)

```
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 String toString()
```

```
String name, author, price, numPages;
```

```
name = name;
```

```
author = author;
```

```
price = this.price;
```

```
numPages = this.numPages;
```

}

```
return name + author + price + numPages;
```

import java.util.Scanner;

class Student

{

String name, USN

int[] marks = new int[6];

Scanner sc = new Scanner(System.in);

void acceptDetails()

System.out.println("Enter the name");

~~String~~ name = sc.next();

System.out.println("Enter the USN");

USN = sc.next();

System.out.println("Enter 6 marks");

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

~~marks[i] = sc.nextInt();~~

}

void calculate()

int sum = 0;

double percentage;

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

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

}

~~percentage = sum/6;~~

~~return percentage;~~

}

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;
}

class Son extends Father {
 private int sonAge;

public Son(int fatherAge, int sonAge) throws
 WrongAge, IllegalAgeException {

void display()

```
System.out.println("The name is " + name);
System.out.println("The usn is " + usn);
System.out.println("The percentage is " +
    calculate() + "%");
```

}

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

```
Scanner scan = new Scanner(System.in);
System.out.println("Enter no. of student");
int stu = scan.nextInt();
Student[] students = new Student[stu];
for(int i=0; i<stu; i++){
    students[i] = new Student();
    System.out.println("Enter details of the
        student");
    students[i].acceptDetails();
}
```

```
System.out.println("Student details are");
for(i=0; i<stu; i++){
    System.out.println("Details of student " + (i+1) +
        " are");
    students[i].display();
}
```

}

super(fatherAge);

if (sonAge >= fatherAge) {

 throw new IllegalArgumentException("Age")

 "Son's age must be less than father's";

 this.sonAge = sonAge;

}
public int getSonAge() {

 return sonAge;

}

public class Main {

 public static void main(String args[]) {

 try {

 Father father = new Father(50);

 Son son = new Son(50, 25);

 System.out.println("father's age: " + father.

 getAge());

 } catch (WrongAge e) {

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

}

 } catch (IllegalArgumentException e) {

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

}

}

class Main {

public static void main(String args[]) {
Scanner s = new Scanner(System.in);
int n;

String name;
String author;
int price;
int numPages;

System.out.println("Enter the num of books");
n = s.nextInt();

Books b[];

b = new Books[n];

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

{

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

System.out.println("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);

}

→ package CSE;

public class Student {
 public String name;
 public String name;
 public int sem;
}

→ package CSE;

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

→ package SFE;
import CSE.Student;

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

→ import CSE.Internal;
import SFE.External;
import java.util.Scanner;
public class Main {
 public static void main(String args[]) {
 int no;
 }
}

② import java.util.Scanner;

class grocery {

 double dal, pulse, sugar;

} grocery()

} dal = 1;

} pulse = 1;

} sugar = 0.5;

}

} grocery (double d, double p, double s)

}

} dal = d;

} pulse = p;

} sugar = s;

}

} grocery (double one)

} dal = one

} pulse = one;

} sugar = one;

}

} grocery (Grocery copy)

} dal = copy.dal;

} pulse = copy.pulse;

} sugar = copy.sugar)

Scanner s = new Scanner(System.in);

int n = s.nextInt();

~~ArrayList~~ Internals[] arrStudents = new Internals[n];
 External[] arrStudents = new External[n];

```
for (int i=0; i<n; i++) {
  System.out.print("USN: ");
  String USN = s.next();
  System.out.print("Name: ");
  String name = s.next();
  System.out.print("Sem: ");
  int sem = s.nextInt();
```

```
arrStudents[i] = new Internals(USN, name, sem,
  arrMarks);
}
```

arrStudents[i] = new Internals(USN, name, sem,
 arrMarks);

}

~~for (int i=0; i<n; i++) {
 String USN = s.next();
 String name = s.next();
 int sem = s.nextInt();~~

```
arrStudents[i] = new Internals();
for (int j=0; j<5; j++) {
  arrMarks[i][j] = s.nextInt();
}
```

- ③ Create a package CIE which has two classes -
Students and Internals. The class Personal has
members like USN, name, sem. The class
Internals has an array that stores the internal
marks scored in five courses of the current semester
of the student. Import the two packages in a
file and declare the final marks of n students
in all five courses.

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

```
class var1
```

```
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")
```

```
and distnct = " + r1 +
```

```
" + " and " + r2);
```

```
}
```

```
else if (D == 0) {
```

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

```
s = Math.sqrt(-D) / (2 * a);
```

```
System.out.println("The roots are")
```

```
and distnct = " + r + " +
```

```
" + " + i + " and " + r + " + ");
```

- ① Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). From three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape, each one of the classes contains only the method printArea() that prints the area of given shape
- ② ~~Create a class Book which contains~~

else L

$$\lambda = -b/(c^2 \cdot a)$$

System will print the roots are
real and equal :- 20,

}

}

}

class Quad L

public static void main (String args) {

vars v = new var(),

v.input (),

v.cal (),

}

}

Output

Enter 1st Co-eff : 1

Enter 2nd Co-eff : 2

Enter 3rd Co-eff : 3

roots are real and equal :- 10

Q
✓

- (Q) Write a program to demonstrate handling of exceptions in inheritance too. Create a base class called "Father" and derived class called "Son" which extends the base class. In Father class, implement a constructor which takes the age and throws the exception WrongAge() when the input age < 0.
- (Q) Write a program which creates two threads, one thread displaying "S P M S College of Engineering" once every 10 sec and another displaying "CSE" once every two seconds.

```
void total() {
```

```
    System.out.println("Total " + (atq * 50) +  
                       (atq * "pulses" * 20) + (atq * "mugan" * 50));
```

{

```
class Run
```

{

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

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

```
    grocery g1 = new grocery();
```

```
    g1 = total();
```

```
    System.out.println("Enter value $ for  
all grocery");
```

```
    double a = SC.nextInt();
```

```
    grocery g2 = new grocery(a);
```

```
    g2 = total();
```

```
    grocery g3 = new grocery(10, 20, 30);
```

```
    g3 = total();
```

```
    grocery g4 = new grocery(g3);
```

```
    g4.total();
```

{

{

Total = 155

Enter the value 10

Total = 1800.0

Total = 3600.0

Total = 3600.0

✓

seeStudents[3].new External (usa, name, sum,
seeMarks);

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

System.out.println("See Students [" + i + "] USA");

System.out.println("See Students [" + i + "] Name");

System.out.println("See Students [" + i + "] Sum");

System.out.println("See Marks[" + i + "]");

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

System.out.println("See Students [" + i + "] Internan
Marks[" + j + "]");

}

System.out.println("Set Marks: ");

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

System.out.println("See Students [" + i + "] SeeMarks[" +

j + "]");

}

}

8/29/2024

- ④ Develop a Java program that prints all real solutions to the quadratic equation $a^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating there are no real solution.
- ⑤ Write a Java program to create a class Student with members USN, name, marks (6 subjects). Include methods to accept student details and marks. Also include a method to calculate the percentage and display appropriate details.
- ⑥ Create a class Book which contains four members: name, author, price, num-pages. Include a constructor to set the values for members. Include methods to set and get the details of the objects. Include a toString() method that could display the complete details of Book.

ISBN 184222CS150 Name: Jeev Sem 3

Internal Marks 1 : 43

2 : 45

3 : 47

4 : 46

5 : 41

External Marks 1 : 90

2 : 87

3 : 65

4 : 99

5 : 43