

LAB1_QuadraticEquatino

```
import java.util.Scanner;

class QuadraticEquations
{
    public static void main(String args[])
    {
        double a,b,c,D;
        double r1,r2;

        Scanner in = new Scanner(System.in);

        System.out.println("Enter the constants a,b and c of the quadratic equation a(x)^2+b(x)+c=0 : ");
        a = in.nextDouble();
        b = in.nextDouble();
        c = in.nextDouble();

        System.out.println();
        System.out.println("Input Quadrature Equation : "+a+"(x)^2 + "+b+"(x) + "+c+" = 0");
        System.out.println();

        D = (b*b)-(4*a*c);

        if(D>0)
        {
            System.out.println("Roots are real and unequal since Discriminant = "+D);
            r1 = (-b + Math.sqrt(D))/(2*a);
            r2 = (-b - Math.sqrt(D))/(2*a);
            System.out.println();
            System.out.println("Roots of the quadratic equation are "+r1+" and "+r2);
        }
        else if(D==0)
    }
```

```

{
    System.out.println("Roots are real and equal since Discriminant = "+D);
    r1 = r2 = (-b)/(2*a);
    System.out.println();

    System.out.println("Roots of the quadratic equation are "+r1+" and "+r2);
}

else
{
    System.out.println();
    System.out.println("Roots are unreal since Discriminant = "+D);
}
}
}

```

```

Enter the constants a,b, and c for the quadratic equation ax^2 + bx + c
1
-2
1
Roots are real and equal.0.0
Roots of the quadratic equation are 1.0 and 1.0
-----
```

```
(program exited with code: 0)
```

```
Press any key to continue . . .
```

IBN19CS191

```
import java.util.Scanner;  
class quadratic_equation
```

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

```
        double a, b, c, sum, root1, root2;
```

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

```
        System.out.println ("Enter the constants a, b, and c for the  
        quadratic expression  $ax^2 + bx + c$ ");
```

```
        a = in.nextDouble();
```

```
        b = in.nextDouble();
```

```
        c = in.nextDouble();
```

```
        sum = (b * b) - (4 * a * c);
```

```
        if (sum >= 0)
```

```
{
```

```
        System.out.println ("Roots are real and unequal " + sum);
```

```
        root1 = (-b + Math.sqrt(sum)) / (2 * a);
```

```
        root2 = (-b - Math.sqrt(sum)) / (2 * a);
```

```
        System.out.println ("Roots are real and unequal " + root1 +  
                           " " + root2);
```

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else if (sum == 0)
{System.out.println ("Roots are real and equal." + sum);
root1 = root2 = (-b) / (2*a);System.out.println ("Roots of the quadratic equation are"
+ root1 "and" + root2); // sum);else if (sum < 0)
{

System.out.println ("Roots are unreal." + sum);

{}

{}

LAB2_StudentSGPA

```
import java.util.Scanner; class
Student{
    Scanner ss= new Scanner(System.in);
    String USN;  String Name;
    int credits[] = new int[5];
    double marks[] = new double[5];
    int points[] = new int[5];
    double SGPA;
    int totalCredits= 0;

    void getDetails(){
        System.out.println("Enter the Student USN: ");
        USN= ss.nextLine();
        System.out.println("Enter the name of the Student: ");      Name=
        ss.nextLine();
        for(int i=0;i<5;i++){
            System.out.println("Enter the amount of Credits for Subject " + (i+1) + ":" );
            credits[i]= ss.nextInt();      totalCredits+= credits[i];
            System.out.println("Enter the Marks obtained by the student for Subject " + (i+1) + " out of 100: ");
            marks[i]= ss.nextDouble();
        }
    }

    void printDetails(){
        System.out.println("Student USN: " + USN);      System.out.println("Student
Name: " + Name);
        for(int i=0;i<5;i++){
            System.out.println("Subject " + (i+1) + " :      Credits: " + credits[i] + "  --> Marks: " + marks[i]);
        }
    }
}
```

```
    }  
    System.out.println("SGPA of " + Name + " is: " + (double)(SGPA/totalCredits));  
}
```

```
void sumSGPA(){  
  
    for(int i=0;i<5;i++){  
  
        if(marks[i] >= 91){  
  
            points[i] = 10;  
  
        }  
        else if(marks[i] >= 81){  
  
            points[i] = 9;  
  
        }  
        else if(marks[i] >= 71){  
  
            points[i] = 8;  
  
        }  
        else if(marks[i] >= 61){  
  
            points[i] = 7;  
  
        }  
        else if(marks[i] >= 51){  
  
    }  
}
```

```
    points[i] = 5;

}

else if(marks[i] >= 41){

    points[i] = 4;

}

else{

    points[i] = 0;

}

SGPA += (points[i]*credits[i]);

}

}

}

public class LAB2 {    public static void

main(String args[]){        Student s1= new

Student();        s1.getDetails();

s1.sumSGPA();        s1.printDetails();

}

}
```

```
C:\Users\adity\Desktop\3-D\OOJ\OOJ LAB>java LAB2
Enter the Student USN:
1BM19CS191
Enter the name of the Student:
ADITYA SATISH KUMAR
Enter the amount of Credits for Subject 1: 5
Enter the Marks obtained by the student for Subject 1 out of 100:
93
Enter the amount of Credits for Subject 2:
4
Enter the Marks obtained by the student for Subject 2 out of 100:
84
Enter the amount of Credits for Subject 3:
5
Enter the Marks obtained by the student for Subject 3 out of 100:
88
Enter the amount of Credits for Subject 4:
5
Enter the Marks obtained by the student for Subject 4 out of 100:
99
Enter the amount of Credits for Subject 5:
5
Enter the Marks obtained by the student for Subject 5 out of 100:
95
```

```
Enter the amount of Credits for Subject 5:
5
Enter the Marks obtained by the student for Subject 5 out of 100:
95
Student USN: 1BM19CS191
Student Name: ADITYA SATISH KUMAR
Subject 1 : Credits: 5 --> Marks: 93.0
Subject 2 : Credits: 4 --> Marks: 84.0
Subject 3 : Credits: 5 --> Marks: 88.0
Subject 4 : Credits: 5 --> Marks: 99.0
Subject 5 : Credits: 5 --> Marks: 95.0
SGPA of ADITYA SATISH KUMAR is: 9.625
```

```
C:\Users\adity\Desktop\3-D\OOJ\OOJ LAB>
```

Aditya Palish Kumar

```
Import java.util.Scanner  
class Student {
```

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

```
    String USN;
```

```
    String Name;
```

```
    int credits[] = new int [5];
```

```
    double marks[] = new double [5];
```

```
    int points[] = new int [5];
```

```
    double SGPA;
```

```
    int totalCredits = 0;
```

```
    void getDetails()
```

```
        System.out.println ("Enter the Student USN : ");
```

```
        USN = ss.nextLine();
```

```
        System.out.println ("Enter the name of the Student : ");
```

```
        Name = ss.nextLine();
```

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

```
        System.out.println ("Enter the amount of credits : ");
```

```
        credits[i] = ss.nextInt();
```

```
        System.out.println ("Enter the marks obtained in ")
```

```
        for subject" + (i+1) + "out of 100 :
```

```
        marks[i] = ss.nextDouble();
```

```
}
```

Aditya Satish Kumar

void printDetails () {

System.out.println ("Student URN: " + URN);

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

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

System.out.println ("Subject" + (i + 1) + ": Credits:

+ credits[i] + " -> Marks: "

= marks[i]);

}

}

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

if (marks[i] >= 91) {

points[i] = 10;

}

else if (marks[i] >= 81) {

points[i] = 9;

}

else if (marks[i] >= 71) {

points[i] = 8;

}

else if (marks[i] >= 61) {

points[i] = 7;

}

else if (marks[i] >= 51) {

points[i] = 6;

}

else if (marks[i] >= 41) {

points[i] = 5;

}

Aditya Salish kumar.

else {

points[i] = 0;
}

GPA += (points[i] * credits[i]);

{

}

}

public static void main(String args[]) {

Student s1 = new Student();

s1.getDetails();

s1.sumGPA();

s1.printDetails();

}

{

LAB3_BookDisplay

```
import java.util.*;
import java.lang.*; class
Book{

    String name, author;
    double
    price; int
    num_pages;
    Scanner in = new Scanner(System.in);

    Book(){
        System.out.println("Enter name of book: "); name
        = in.nextLine();
        System.out.println("Enter name of author: "); author
        = in.nextLine();
        System.out.println("Enter price of book in Rs: "); price
        = in.nextDouble();
        System.out.println("Enter number of pages in the book: "); num_pages
        = in.nextInt();

    }

    void show(){
        System.out.println("Name: " + name);
        System.out.println("Author: " + author);
        System.out.println("Price: " + price);
        System.out.println("Number of pages: " + num_pages);

    }
}
```

```
public String toString(){

    return name + ", By " + author + " for Rs." + price + " and has " +
num_pages + " pages";

}

public static void main(String[] args){

    Scanner in = new Scanner(System.in);

    int n, x;

    System.out.println("Enter number of books to be created: ");
    n
    =
    in.nextInt();

    Book B[] = new Book[n];

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

        System.out.println("Book " + (i+1));
        B[i] = new Book();
        System.out.println();

    }

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

        System.out.println("Book " + (i+1));
        System.out.println(B[i]);
        System.out.println();

    }

    do {
```

```

        System.out.println("Enter the book number whose details
you want to display: ");

        x = in.nextInt();

    }

    while(x < 1 && x > n);

    B[x-1].show();

}

}

```

```

C:\JAVA>java Book
Enter number of books to be created:
2
Book 1
Enter name of book:
English Literature
Enter name of author:
Aditya
Enter price of book in Rs:
200
Enter number of pages in the book:
200

Book 2
Enter name of book:
Hindi Literature
Enter name of author:
Satish
Enter price of book in Rs:
300
Enter number of pages in the book:
300

Book 1
English Literature, By Aditya for Rs.200.0 and has 200 pages

Book 2
Hindi Literature, By Satish for Rs.300.0 and has 300 pages

Enter the book number whose details you want to display:
2
Name: Hindi Literature
Author: Satish
Price: 300.0
Number of pages: 300

C:\JAVA>

```

Q

```
Ans import java.util.*;  
import java.lang.*;  
class Book {  
    String name, author;  
    double price;  
    int num_pages;  
    Scanner in = new Scanner(System.in);
```

```
Book () {
```

```
    System.out.println("Enter name of book");
```

```
    name = in.nextLine();
```

```
    System.out.println("Enter name of author");
```

```
    author = in.nextLine();
```

```
    System.out.println("Enter price of book");
```

```
    price = in.nextDouble();
```

```
    System.out.println("Enter number of pages in the book");
```

```
    num_pages = in.nextInt();
```

```
}
```

```
void show() {
```

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

```
    System.out.println("Author : " + author);
```

```
    System.out.println("Price : " + price);
```

```
    System.out.println("Number of pages : " + num_pages);
```

```
}
```

```
Public String toString() {
```

return name + ", By " + author + " for Rs " + price + " and has " + num_pages + " pages";

```
}
```

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

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

```
int n, x;
```

```
System.out.println ("Enter the number of books to be created: ");
```

```
n = in.nextInt();
```

```
Book B[] = new Book [n];
```

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

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

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

```
B[i] = new Book ();
```

```
}
```

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

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

```
System.out.println (B[i]);
```

```
do { }
```

```
System.out.println ("Enter the book number whose details you want to display");
```

```
x = in.nextInt();
```

```
while (x < 1 || x > n);
```

```
{ }
```

LAB4_AbstractClass

```
import java.util.*; import java.lang.*;
```

```
abstract class Shape{
```

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

```
    int x1, x2;
```

```
    Shape(){
```

```
        System.out.println("Enter two numbers:");
```

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

```
        x1=in.nextInt();           x2=in.nextInt();
```

```
}
```

```
    abstract void printarea();
```

```
}
```

```
class Rectangle extends Shape{
```

```
    void printarea(){
```

```
        System.out.println("Area of Rectangle: " + (x1 * x2));
```

```
}
```

```
}
```

```
class Triangle extends Shape{
```

```
    void printarea(){
```

```
        System.out.println("Area of Triangle: " + (x1 * x2)/2);      }

}

class Circle extends Shape{

    void printarea(){

        System.out.println("Area of Circle 1: " + (3.14 * x1 * x1));
        System.out.println("Area of Circle 2: " + (3.14 * x2 * x2));

    }

}

class Abstract{

    public static void main(String[]args){

        Shape s;
        s = new
Rectangle();
        s.printarea();
        s = new
Triangle();
        s.printarea();
        s = new
Circle();
        s.printarea();

    }
}
```

```
C:\Users\Aditya\Desktop\3-D\OOJ LAB>javac Abstract.java
C:\Users\Aditya\Desktop\3-D\OOJ LAB>java abstract
Error: Could not find or load main class abstract
C:\Users\Aditya\Desktop\3-D\OOJ LAB>java Abstract
Enter two numbers:
2
4
Area of Rectangle: 8
Enter two numbers:
2
3
Area of Triangle: 3
Enter two numbers:
3
4
Area of Circle 1: 28.25999999999998
Area of Circle 2: 50.24
C:\Users\Aditya\Desktop\3-D\OOJ LAB>D_
}
```

8

```
Ans import java.util.*;  
import java.lang.*;
```

```
abstract class shape {
```

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

```
int x1, x2;
```

```
Shape() {
```

```
System.out.println("Enter two numbers : ");
```

```
x1 = in.nextInt();
```

```
x2 = in.nextInt();
```

```
}
```

```
abstract void printarea();
```

```
class Rectangle extends Shape {
```

```
void printarea() {
```

```
System.out.println("Area of Rectangle : " + (x1*x2));
```

```
}
```

```
class Triangle extends Shape {
```

```
void printarea() {
```

```
System.out.println("Area of triangle : " + (x1*x2)/2);
```

```
}
```

```
class Circle extends Shape {
```

```
void printarea() {
```

```
System.out.println("Area of circle 1 : " + (3.14*x1*x1));
```

```
System.out.println("Area of circle 2 : " + (3.14*(x2*x2)));
```

```
}
```

```
class Abstract {
```

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

```
        Shape s;
```

```
        s = new Rectangle();
```

```
        s.paintarea();
```

```
        s = new Triangle();
```

```
        s.paintarea();
```

```
        s = new Circle();
```

```
        s.paintarea();
```

```
}
```

```
}
```

LAB5_BankDetails

```
import java.util.*; import java.lang.*;  
  
class Bank{  
  
    String name, abc;  
    int accNo;      char  
    accType;      double balance  
    = 0;      double deposit;  
    double  
    chequeAmount;  
  
    Scanner in = new Scanner(System.in);  
  
    void inputData() {  
  
        System.out.println("Enter your account type (Savings/Current):");  
        abc = in.nextLine();          accType =  
        abc.charAt(0);  
    }  
  
    void deposit() {  
  
        System.out.println("Enter an amount to deposit: ");  
        deposit = in.nextDouble();  
  
        balance += deposit;  
        System.out.println("Balance has been updated ");  
        System.out.println("");  
    }  
  
    void viewBalance(){
```

```
        System.out.println("Balance = " + balance);

        System.out.println("");
    }

public static void main(String[]args){

    Scanner s = new Scanner(System.in);
    int x;
    Bank a1 = new Bank();           a1.inputData();

    if(a1.accType == 'C' || a1.accType == 'c'){

        Current a2 = new Current();

        do{

            System.out.println("WELCOME TO YOUR CURRENT
ACCOUNT");
            System.out.println("");
            System.out.println("(1) Deposit ");
            System.out.println("(2) Check balance ");
            System.out.println("(3) Issue Cheque ");
            System.out.println("(4) Exit");

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

            x = s.nextInt();

            switch(x){

                case 1: a2.deposit();
                break;
            }
        }
    }
}
```

```
        case 2: a2.checkBalance();
        break;
        case 3: a2.issueCheque();
        break;
        case 4: System.exit(0);
        break;
    default: System.out.println("ERROR. INVALID
CHOICE.");
}
```

```
}
```

```
while(x <= 4 && x >= 1);
```

```
}
```

```
else if (a1.accType == 'S' || a1.accType == 's'){


```

```
Savings a3 = new Savings();
```

```
do{
```

```
System.out.println("WELCOME TO YOUR SAVINGS ACCOUNT");
```

```
System.out.println("(1) Deposit"); System.out.println("(2) View
balance");
```

```
System.out.println("(3) Withdraw ");
```

```
System.out.println("(4) Calculate compound interest
");
```

```
System.out.println("(5) Exit ");
```

```
System.out.println("Enter your choice: ");
```

```
x = s.nextInt();
```

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

```
switch(x){  
    case 1: a3.deposit();  
    break;  
    case 2: a3.viewBalance();  
    break;  
    case 3: a3.balanceAfterWithdrawal();  
    break;  
    case 4: a3.computeCI();  
    break;  
    case 5: System.exit(0);  
    break;  
    default: System.out.println("ERROR.  
INVALID CHOICE.");  
  
}  
  
}  
  
while(x <= 5 && x >=1);  
  
}  
  
else System.out.println("INVALID ACCOUNT TYPE");  
  
}  
  
}  
  
class Current extends Bank {  
  
    Current(){
```

```
        System.out.println("Enter your name: ");
        name = in.nextLine();
        System.out.println("");

System.out.println("Enter your account number: ");    accNo = in.nextInt();
System.out.println("");

deposit();

}

void issueCheque(){

    System.out.println("Enter amount for which cheque is to be issued.");
    chequeAmount = in.nextDouble();
    System.out.println("");

    if(chequeAmount > balance){

        System.out.println("ERROR! Insufficient amount in your account."); }

    else{
        balance -= chequeAmount;

System.out.println("Cheque has been issued SUCCESSFULLY");
System.out.println("");

    }

}

void checkBalance(){

    if(balance < 1000){
```

```
        System.out.println("Current available balance is lesser than  
minimum required balance.");  
  
        balance -= 100;  
  
System.out.println("Service charge of Rs.100 has been deducted from your balance.");  
  
    }  
  
    viewBalance();  
  
}  
  
}  
  
class Savings extends Bank{  
  
    double CI, withdrawalAmount, time;  
  
    Savings(){  
  
        System.out.println("Enter your name: ");  
        name = in.nextLine();  
        System.out.println("");  
  
        System.out.println("Enter your account number: ");  
        accNo = in.nextInt();  
        System.out.println("");  
  
        deposit();  
    }  
  
    void computeCI() {
```

```
System.out.println("Enter time period: ");      time
= in.nextInt();

System.out.println("");

CI = balance * Math.pow(1 + (0.08 / 12), 12 * time) - balance;

System.out.println("CI = " + CI);      balance
+= CI;

System.out.println("CI has been deposited");

}

void balanceAfterWithdrawal(){

    System.out.println("Enter the amount you want to withdraw:");
    withdrawalAmount = in.nextDouble();

    if(withdrawalAmount > balance){

        System.out.println("ERROR! The entered amount is greater than the available balance...");

    }

    else {

        balance -= withdrawalAmount;
        System.out.println("Amount has been successfully withdrawn!!!!");

    }

}

}
```

```
C:\ Command Prompt
C:\JAVA>java Bank
Enter your account type (Savings/Current):
Savings
Enter your name:
Aditya

Enter your account number:
1234

Enter an amount to deposit:
50000
Balance has been updated

WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
2

Balance = 50000.0

WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
1

Enter an amount to deposit:
30000
Balance has been updated

WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
2

Balance = 80000.0

WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
3

Enter the amount you want to withdraw:
40000
Amount has been successfully withdrawn!!!!
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
2

Balance = 40000.0

WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
4

Enter time period:
3

CI = 10809.482064826028
CI has been deposited
WELCOME TO YOUR SAVINGS ACCOUNT
(1) Deposit
```

```
Command Prompt
(1) Deposit
(2) View balance
(3) Withdraw
(4) Calculate compound interest
(5) Exit
Enter your choice:
5

C:\JAVA>
```

8

```
Ans import java.util.*;  
import lang.util.*;
```

```
class Bank {
```

```
    String name, abc;
```

```
    int accNo;
```

```
    char accType;
```

```
    double balance = 0;
```

```
    double deposit;
```

```
    double chequeAmount;
```

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

```
void inputData() {
```

```
    System.out.println("Enter your account type (Savings/Current): ");
```

```
    abc = in.nextLine();
```

```
    accType = abc.charAt(0);
```

```
}
```

```
void deposit() {
```

```
    System.out.println("Enter an amount to deposit: ");
```

```
    deposit = in.nextDouble();
```

```
    balance += deposit;
```

```
    System.out.println("Balance has been updated");
```

```
}
```

```
void viewBalance() {
```

```
    System.out.println("Balance = " + balance);
```

```
}
```

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

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

```
int x;
```

```
Bank a1 = new Bank();
```

```
a1.inputData();
```

```
if (a1.acctype == 'c' || a1.acctype == 'C') {
```

```
Curent a2 = new Current();
```

```
do {
```

```
System.out.println ("Welcome To Your Current Account");
```

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

```
System.out.println ("(2) Check Balance");
```

```
System.out.println ("(3) Issue Cheque");
```

```
System.out.println ("(4) Exit");
```

```
System.out.println ("Enter your choice");
```

```
switch (x) {
```

```
case 1: a2.deposit();
```

```
break;
```

```
case 2: a2.checkBalance();
```

```
break;
```

```
case 3: a2.issueCheque();
```

```
break;
```

```
case 4: System.exit(0);
```

```
default: System.out.println ("Invalid choice");
```

```
}
```

```
while (x <= 4 & & x >= 1);
```

```
}
```

```
else if (at.accType == 's' || at.accType == 'S') {
```

```
    Savings a3 = new Savings();
```

```
do {
```

```
    System.out.println("Welcome to your Savings Account");
```

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

```
    System.out.println("(2) View Balance");
```

```
    System.out.println("(3) Withdraw");
```

```
    System.out.println("(4) Calculate Compound Interest");
```

```
    System.out.println("(5) Exit");
```

```
    System.out.println("Enter your choice");
```

```
x = s.nextInt();
```

```
switch(x) {
```

```
    case 1: a3.deposit();
```

```
        break;
```

```
    case 2: a3.viewBalance();
```

```
        break;
```

```
    case 3: a3.balanceAfterWithdrawal();
```

```
        break;
```

```
    case 4: a3.compInterest();
```

```
        break;
```

```
    default: System.out.println("Invalid choice");
```

```
}
```

```
} while(x <= 5 & x >= 1);
```

```
else System.out.println("Invalid Account Type");
```

class Current extends Bank {

Current () {

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

System.out.println ("Enter your account number ");
accNo. = Integer.parseInt (in.nextLine());

deposit();

void issueCheque () {

System.out.println ("Enter the amount for which the cheque
to be issued ");

chequeAmount = in.nextDouble();

if (chequeAmount > balance) {

System.out.println ("Insufficient amount ");

else () {

balance -= chequeAmount;

System.out.println ("Cheque has been issued successfully ");

void checkBalance () {

if (balance < 1000) {

System.out.println ("Current available balance is insufficient ");

balance -= 100;

viewBalance();

class Savings extends Bank {

 double CT, withdrawalAmount, time;

Savings () {

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

 name = in.nextLine();

 System.out.println ("Enter your account number ");

 accNo = in.nextInt();

 deposit();

}

void computeCI () {

 System.out.println ("Enter time period: ");

 time = in.nextInt();

 CI = balance * Math.pow (1 + (0.08 / 12), 12 * time) - balance;

 System.out.println ("CI = " + CI);

 balance += CI;

 System.out.println ("CI has been deposited ");

}

void balanceAfterWithdrawal () {

 System.out.println ("Enter the amount you want to withdraw ");

 withdrawalAmount = in.nextDouble();

 if (withdrawalAmount > balance) {

 System.out.println ("Entered amount is greater than balance ");

}

 else {

 balance -= withdrawalAmount;

 System.out.println ("Successful ");

}

}

}

LAB6_PACKAGES

```
import CIE.*; import
SEE.*; import
java.util.*;

class Main
{
    public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number of students");
        int n= sc.nextInt();
        CIE.internals in[] = new CIE.internals[n];
        SEE.externals en[] = new SEE.externals[n];
        CIE.student gn[] = new CIE.student[n];
        int i,j;
        for(i=0;i<n;i++)
        {
            System.out.println("Student
"+(i+1));
            in[i] = new CIE.internals();
            en[i] = new SEE.externals();
            gn[i] = new CIE.student();
            gn[i].getDetails();
        }
        System.out.println("CIE MARKS:");
        in[i].accept();
        System.out.println("SEE MARKS:");
        en[i].get();
        System.out.println();
        gn[i].display();
        for(j=0;j<5;j++)
    }
```

```
        System.out.println("Total Marks "+(j+1)+": "+(in[i].cie[j] + (en[i].see[j]/2)));

    }

}

package CIE; import  
java.util.*; public  
class student  
{  
    public String name;  
    public int sem;  public String  
    usn;  
  
    public void getDetails()  
    {  
        Scanner s = new Scanner(System.in);  
        System.out.println("Enter the name");  
        name = ss.next();  
        System.out.println("Enter the semester");  
        sem = ss.nextInt();  
        System.out.println("Enter the USN:");  
        usn = ss.next();  
    }  
    public void display()  
{  
        System.out.println("Student details: ");  
        System.out.println("Name: "+ name);  
        System.out.println("USN: "+ usn);
```

```
System.out.println("Semester: "+ sem);

}

}

package SEE;

import java.util.*; import CIE.*; public

class externals extends student

{

    public double see[];

    public void get()

    {

        see= new double[5];

        Scanner in = new Scanner(System.in);

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

        {

            System.out.println("SEE mark for subject "+(i+1)+" : ");

            see[i]= in.nextDouble();

        }

    }

}
```

```

package CIE; import
java.util.*; public
class internals

{
public double cie[]; 

public void accept()
{
cie= new double[5];
Scanner ss = new Scanner(System.in);

for(int i=0;i<5;i++)
{
System.out.println("CIE mark for subject "+(i+1)+" : ");
cie[i]= ss.nextDouble();
}
}

```

Command Prompt
C:\JAVA\Packages>java Main
Enter the number of students
2
Student 1
Enter the name
Aditya
Enter the semester
3
Enter the USN:
1BM19C191
CIE MARKS:
CIE mark for subject 1 :
35
CIE mark for subject 2 :
30
CIE mark for subject 3 :
28
CIE mark for subject 4 :
39
CIE mark for subject 5 :
38
SEE MARKS:
SEE mark for subject 1 :
90
SEE mark for subject 2 :
99
SEE mark for subject 3 :
78
SEE mark for subject 4 :
67
SEE mark for subject 5 :
88
88
Student details:
Name: Aditya
USN: 1BM19C191
Semester: 3
Total Marks 1: 80.0
Total Marks 2: 79.5
Total Marks 3: 67.0
Total Marks 4: 72.5
Total Marks 5: 82.0
Student 2
Enter the name
Satish
Enter the semester
3
Enter the USN:
1BM19CS191
CIE MARKS:
CIE mark for subject 1 :
39

}

PAGE:

PAGE:

OOJ-LAB6Aditya Satish Kumar
IBM1AACE(9)

package CIE;
import java.util.*;
public class Student
{
 public String name;
 public int sem;
 public String usn;

public void getDetails()
{

Scanner in = new Scanner(System.in);
System.out.println("Enter the name:");
name = in.nextLine();
System.out.println("Enter the semester:");
int = in.nextInt();
System.out.println("Enter USN no.");
usn = in.nextLine();
f.

public void display()
{

System.out.println("The Student Details:");
System.out.println("Name: " + name);
System.out.println("USN: " + usn);
System.out.println("Semester: " + sem);

```
package CIE;  
import java.util.*;  
}  
public double cie[];  
public void accept()  
{  
    cie = new double[5];  
    Scanner in = new Scanner(System.in);  
    for (int i = 0; i < 5; i++)  
    {  
        System.out.println("CIE mark scored for subject " + (i+1) + ":");  
        cie[i] = in.nextDouble();  
    }  
}
```

```
package SEE;  
import java.util.*;  
import CIE.*;  
public class external extends student  
{
```

```
    public double see[];  
    public void get()  
    {  
        see = new double[5];  
        Scanner in = new Scanner(System.in);  
    }
```

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

```
System.out.println ("SEE marks for subject " + (i+1) + " : ");  
see[i] = in.nextDouble();  
}.
```

```
}.
```

```
import CIE.*;  
import SEE.*;  
import java.util.*;
```

```
class Main  
{
```

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

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

```
System.out.println ("Enter the number of students : ");
```

```
int n = in.nextInt();
```

```
CIE.intervals in[] = new CIE.intervals [n];
```

```
SEE.intervals in[] = new SEE.intervals [n];
```

```
int i, j;
```

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

```
{
```

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

```
in[i] = new CIE.intervals ();
```

```
in[i] = new SEE.intervals ();
```

```
in[i].getDetails();
```

System.out.println("CIE marks: ");

in[i].accept();

System.out.println("SEE marks: ");

en[i].get();

System.out.println();

in[i].display();

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

}

System.out.println("Total marks: " + (j+1) + ":" +

(in[i].cie[i] + en[i].see[i]/2))

}

{

LAB7_GENERICCS

```
import java.util.*; import  
java.lang.*;  
  
class gen<A, B>{  
    A ob1;  
    B ob2;  
    gen(A x, B y){  
        ob1 = x;  
        ob2 = y;  
    }  
  
    void showTypes(){  
        System.out.println("Type of A is::>" + ob1.getClass().getName());  
        System.out.println("Type of B is::>" + ob2.getClass().getName());  
    }  
    A getob1(){  
        return ob1;  
    }  
    B getob2(){  
        return ob2;  
    }  
  
    class Generics{  
        public static void main(String[] args){  
            gen<Integer, String> obtObj = new gen<Integer,  
String>(45, "Generics");
```

```
obtObj.showTypes();
```

PAGE:

```
int a = obtObj.getob1();
System.out.println("value::>" + a);
String b = obtObj.getob2();
System.out.println("value::>" + b);
```

```
}
```

```
}
```

OOJ LAB-7

Aditya Satish Kumar
IBMI9CS191

&

Ans

```
import java.util.*;
import java.lang.*;
```

```
class gen <A, B, C> {
```

```
    A ob1;
```

```
    B ob2;
```

```
    C ob3;
```

```
    gen (A x, B y, C z) {
```

```
        ob1 = x;
```

```
        ob2 = y;
```

```
        ob3 = z;
```

```
}
```

```
void showTypes() {
```

```
    System.out.println("Type of A is: " + ob1.getClass().getName());
```

```
    System.out.println("Type of B is: " + ob2.getClass().getName());
```

```
    System.out.println("Type of C is: " + ob3.getClass().getName());
```

```
}
```

```
A.getob1() {
```

```
    return ob1;
```

```
}
```

```
B.getob2() {
```

```
    return ob2;
```

```
}
```

```
C.getob3() {
```

```
    return ob3;
```

```
}
```

```
}
```

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IBM 19CS191

class Generics {

 public static void main (String [] args) {

 gen < Integer, String, Double > obj =

 new gen < Integer, String, Double > (45, "Generics", 420.48);

 obj.showTypes();

 int a = obj.getobj1();

 System.out.println ("Value : " + a);

 String b = obj.getobj2();

 System.out.println ("Value : " + b);

 double c = obj.getobj3();

 System.out.println ("Value : " + c);

}

}

LAB8_EXCEPTIONHANDLING

```
import java.util.*; import  
java.lang.*;  
  
class Father {  
    int age;  
    Scanner ss = new Scanner(System.in);  
    Father() throws WrongAge {  
        System.out.print("Enter the Father's age::> ");  
        age = ss.nextInt();  
        if(age < 0){ throw new WrongAge(age);  
    }  
}  
  
class Son extends Father {  
    int age;  
    Son() throws WrongAge {  
        super();  
        System.out.print("Enter the Son's age::> ");  
        age = ss.nextInt();  
        if(age < 0){ throw new WrongAge(age);  
    }  
    if(age > super.age || age == super.age){  
        throw new WrongAge(age);  
    }  
    System.out.println("Nothing wrong here..");  
}
```

```
class LAB8 {  
    public static void main(String args[]) {  
        try{  
            Son so = new Son();  
        }  
        catch(WrongAge e){  
            System.out.println(e);  
        }  
    }  
  
    import java.util.*; import  
    java.lang.*;  
  
    public class WrongAge extends Exception {  
        int x;  
        WrongAge(int x){  
            this.x = x;  
        }  
        public String toString(){  
            return "Error..Son's age cannot be  
greater than the father's age.. ";  
        }  
    }  
}
```

LAB8

Aditya Satish Kumar
IBM1dacs191

import java.util.*;
import java.util.lang.*;

class Father {

int age;

Scanner in = new Scanner (System.in);

Father () throws WrongAge {

System.out.print ("Enter the Father's age: ");

age = in.nextInt();

if (age < 0) {

throw new WrongAge (age);

}

class Son extends Father {

int age;

Son () throws WrongAge {

super();

System.out.println ("Enter the age of the Son: ");

age = in.nextInt();

if (age < 0) {

throw new WrongAge (age);

}

if (age > 0) {

if (age > super.age || age == super.age) {

throw new WrongAge (age);

}

```
class LAB8 {  
    public static void main (String [] args) {  
        try {  
            Son s = new Son ();  
        }  
        catch (WrongAge e) {  
            System.out.println (e);  
        }  
    }  
}
```

```
import java.util.*;  
import java.lang.*;  
  
public class WrongAge extends Exception {  
    int x;  
    WrongAge (int x) {  
        this.x = x;  
    }  
    public String toString () {  
        return "Error";  
    }  
}
```

```
C:\Users\Aditya\Desktop\3-D\OOJ LAB>cd LAB8  
C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>javac LAB8.java  
C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>javac WrongAge.java  
C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>java LAB8  
Enter the Father's age::> 45  
Enter the Son's age::> 18  
Nothing wrong here..
```

```
C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>java LAB8  
Enter the Father's age::> 45  
Enter the Son's age::> 77  
Error..Son's age cannot be greater than the father's age..  
C:\Users\Aditya\Desktop\3-D\OOJ LAB\LAB8>
```

LAB9_MULTITHREADING

```
import java.util.*;
Import java.lang.*;

class NewThread implements Runnable {
    String name;
    int interval;
    int repeat;
    Thread t;
    NewThread(String name,int interval,int repeat){
        this.name = name;
        this.repeat = repeat;
        this.interval = interval;
        t = new Thread(this,name);
        t.start();
    }
    public void run(){
        try{
            for(int i=repeat;i>0;i--){
                System.out.println(""+name);
                Thread.sleep(interval);
            }
        }
        catch(InterruptedException e){
            System.out.println("Child Interrupted "+name);
        }
    }
}

class LAB9 {
    public static void main(String args[]){
        new NewThread("BMS College Engineering",10000,5);
        new NewThread("CSE",2000,20);
        try{
            for(int i=5;i>0;i--){
                Thread.sleep(10000);
            }
        }
        catch(InterruptedException e){
            System.out.println("Main Thread Interrupted");
        }
    }
}
```

Command Prompt

C:\Users\Aditya\Desktop\3-D\OOJ LAB>javac LAB9.java

C:\Users\Aditya\Desktop\3-D\OOJ LAB>java LAB9

BMS College of Engineering

CSE

CSE

CSE

CSE

CSE

BMS College of Engineering

CSE

CSE

CSE

CSE

CSE

CSE

BMS College of Engineering

CSE

CSE

CSE

CSE

CSE

BMS College of Engineering

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CSE

CSE

BMS College of Engineering

CSE

CSE

CSE

CSE

CSE

BMS College of Engineering

CSE

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LAB 9

```
import java.util.*;
import java.lang.*;

class NewThread implements Runnable {
    String name;
    this.repeat;
    int repeat;
    int interval;
    Thread t;
    NewThread (String name, int interval, int repeat) {
        this.name = name;
        this.repeat = repeat;
        this.interval = interval;
        t = new Thread (this, name);
        t.start();
    }
    public void run() {
        try {
            for (int i = repeat; i > 0; i--) {
                System.out.println (" " + name);
                Thread.sleep (interval);
            }
        } catch (InterruptedException e) {
            System.out.println ("Child interrupted " + name);
        }
    }
}
```

```
class LAB9 { }
```

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

```
System.out.println ("BMS College of Engineering,"  
10000, 5);
```

```
new Thread ("BMS college of Engineering", 10000, 5);
```

```
new Thread ("CSE", 2000, 20);
```

```
try {
```

```
for (int i = 5; i > 0; i--) {
```

```
Thread.sleep (10000);
```

```
}
```

```
}
```

```
catch (InterruptedException e) {
```

```
System.out.println ("Main Thread Interrupted");
```

```
}
```

```
}
```

LAB10_USER INTERFACE

```
import java.awt.*;
import java.awt.event.*;

class SampleDialog extends Dialog implements ActionListener {
    LAB10 bld;
    SampleDialog(Frame parent, String title) {

        super(parent, title, false);
        bld=(LAB10)parent;
        setLayout(new FlowLayout());
        setSize(300, 200);
        add(new Label(bld.msg1));
        Button b;
        add(b = new Button("OK"));
        b.addActionListener(this);
    }
    public void actionPerformed(ActionEvent ae) {
        dispose();
    }
}

public class LAB10 extends Frame implements ActionListener
{
    TextField num1,num2,result;

    String msg="",msg1="";
    Button divide;
    public LAB10()
    {
        setLayout(new FlowLayout());
        Label nnum1=new Label("Num1: ",Label.RIGHT);
        Label nnum2=new Label("Num2: ",Label.RIGHT);
        Label rresult=new Label("Result: ",Label.RIGHT);
        Button b=new Button("divide");
        num1=new TextField(8);
        num2=new TextField(8);
        result=new TextField(8);
        add(nnum1);
        add(num1);
```

```
add(nnum2);
add(num2);
divide=(Button)add(b);
add(rresult);
add(result);

num1.addActionListener(this);
num2.addActionListener(this);
divide.addActionListener(this);

addWindowListener(new WindowAdapter()
{
public void windowClosing(WindowEvent we)
{
System.exit(0);
}
});
}

public void actionPerformed(ActionEvent ae)
{
if(ae.getSource()==divide)
{
try
{
msg(""++Integer.parseInt(num1.getText())+Integer.parseInt(num2.getText()));
String c="" +msg;
result.setText(c);
msg1="";
}

}catch(NumberFormatException e)
{
msg1="Entered number is not an integer "+e;
SampleDialog d = new SampleDialog(this, "Dialog");
d.setVisible(true);

}

catch(ArithmeticException e)
{
msg1="number 2 is zero "+e;
SampleDialog d = new SampleDialog(this, "Dialog");
d.setVisible(true);

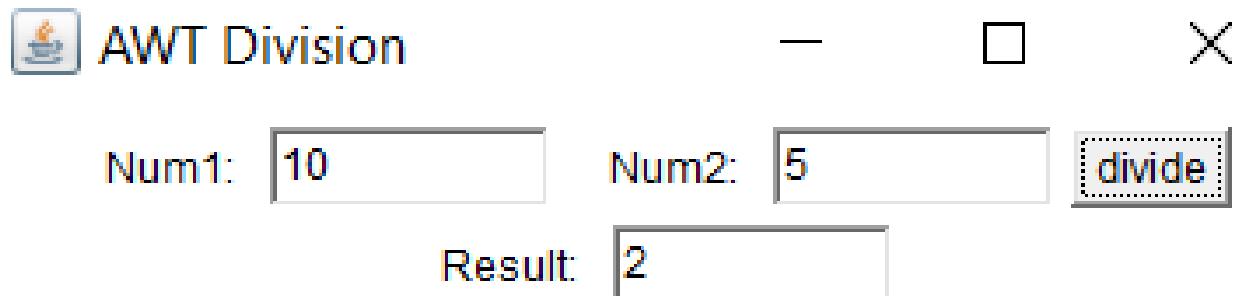
}

}
```

```
}

public static void main(String[] args)
{
LAB10 aa=new LAB10();
aa.setSize(new Dimension(400,400));
aa.setTitle("AWT Division");
aa.setVisible(true);
}

}
```



LAB 10

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18MIS03191

Q.

```
Ans import java.awt.*;
```

```
import java.awt.event.*;
```

```
class SampleDialog extends Dialog implements ActionListener {
```

```
LAB10 bld;
```

```
SampleDialog (Frame Parent, String title) {
```

```
super (parent, title, false);
```

```
bld = (LAB10) parent;
```

```
setLayout (new FlowLayout());
```

```
setSize (300, 200);
```

```
add (new Label (bld.msg1));
```

```
Button b;
```

```
add (b = new Button ("OK"));
```

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

```
}
```

```
public void actionPerformed (ActionEvent ae) {
```

```
dispose();
```

```
}
```

```
}
```

```
public class LAB10 extends Frame implements ActionListener {
```

```
TextField num1, num2, result;
```

```
String msg = "", msg1 = "";
```

```
Button divide;
```

```
public LAB10 () {
```

```
setLayout (new FlowLayout());
```

```
Label num1 = new Label ("Num1: ", Label.RIGHTRIGHT);
```

```
Label num2 = new Label ("Num2: ", Label.RIGHT);
```

```
Label result = new Label ("Result: ", Label.RIGHT);
```

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1BM19CS191

Button b = new Button("Divide");

num1 = new TextField(8);

num2 = new TextField(8);

result = new TextField(8);

add(num1);

add(num1);

add(num2);

add(num2);

divide = (Button) add(b);

add(result);

add(result);

num1.addActionListener(this);

num2.addActionListener(this);

divide.addActionListener(this);

addWindowListener(new WindowAdapter()) {

public void windowClosing(WindowEvent e) {

System.exit(0);

}

});

public void actionPerformed(ActionEvent e) {

if (e.getSource() == divide) {

try {

msg = num1.getText() +
Integer.parseInt(num1.getText()) /

Integer.parseInt(num2.getText());

String c = " " + msg;

result.setText(c);

} mg1 = " ";

Aditya Satish Kumar

18M19CSE91

catch (NumberFormatException e) {

msg1 = "Entered number is not an Integer" + e;

Sample Dialog d = new SampleDialog (this, "Dialog");
d.setVisible (true);

}

public static void main (String [args]) {

Frame f = new Frame ();

aa = new AWTDivision (400, 400);

aa.setTitle ("AWT Division");

aa.setVisible (true);

}

}

