LAB 1

→ Java program to print real solutions of quadratic eqn $ax^2+bx+c=0$

$D = b^2 - 4ac$

```
import java.util.Scanner;
class Quadratic {
public static void main(System.in);
Scanner in = new Scanner (System.in);
double a, b, c, d, x1, x2;
System.out.println("enter the value of variable a");
  a = in.nextDouble();
System.out.println("enter the value of variable b");
  b = in.nextDouble();
System.out.println("enter the value of variable c");
  c = in.nextDouble();
  d = (b*b) - 4*a*c;
  if (d>0){
  x1 = (-b + Math.sqrt(d))/(a*2);
  x2 = (-b - Math.sqrt(d))/(2*a);
  System.out.println("the roots are real and distinct");
  System.out.println("the roots are "+x1+"and"+x2);
  }
  else if (d==0){
  x1 = x2 = -b/(2*a);
  System.out.println("the roots are real and equal");
  System.out.println("the roots are "+x1+"and"+x2);
  }
  else if (d<0)
  {
  System.out.println("there are no real roots");
  }
  }
  }
```

Output

```
enter the value of variable - a
2
enter the value of variable - b
1
enter the value of variable c
-1
the roots are real and distinct
the roots are 0.5 and -1.0
```

LAB - 2

```
import java.util.Scanner;
class Student{
String usn, name;
static int credits[];
static double marks[];
void input(int n)
{
Scanner sc = new Scanner(System.in);
System.out.println("enter usn and name");
usn = sc.nextline();
name = sc.nextline();
System.out.println("enter the marks with credits
      of that Subject");
for(int i=0; i<n; i++)
  {
  marks[i] = sc.nextDouble();
  credits[i] = sc.nextInt();
  System.out.println();
  }
}
```

```
double calculate (int n)
{
  int c, cred=0;
  double tot, total = 0.0;
  for (int i=0; i<n; i++)
  {
    tot = mark[i];
    if (tot>90)
        c=10;
      else if (tot > 80)
        c = 9;
      else if(tot> 70)
        c = 8;
      else if (tot > 60)
        c=7;
      else if(tot > 50)
        c = 6
      else if(tot > 40)
        c = 5;
      else
      c = 0;
  total = total + (c*credits[i]);
    cred = cred+ credits[i];
  }
  total = total/cred;
    return (total);
  }
```

```
void display( int n, double total)
{
System.out.println("name of student : "+name);
System.out.println("usn of student : "+usn);
System.out.println("marks of student along with credit");
for (int i =0; i<n; i++)
{
System.out.println(marks[i]+" "+credits[i]);
}
System.out.println("sgpa of Student : "+total);
}
public static void main(String args[])
{
Scanner sc= new Scanner(System.in);
Student obj = new student();
System.out.println("enter the number of courses");
int n = sc.nextInt();
credits = new int[n];
marks = new double[n];
obj.input(n);
double total = obj.calculate(n);
obj.display(n, total);
}
}
```

Out put

```
enter the number of courses
3
enter usn and name
125
Puneeth
enter the marks along with credits
72
4
85
5
90
3
```

name of student : Puneeth

usn of student : 125

marks of student along with credits of course

72.0	4
85.0	5
90.0	3

sgpa of student : 8.916666

LAB 3

```
import java.util.Scanner;
 clas Book{
  String name;
  String author;
   int price;
   int num_pages;
  Scanner p = new Scanner (System.in);
  Void details(){
  System.out.println("Enter the name of the book");
   name = p.nextLine();
  System.out.println("Enter the name of author");
   author = p.nextLine();
   System.out.println("Enter the price of book");
    price = p.nextInt();
   System.out.println("Enter the number of pages in the book
   num_pages = p.nextInt();
   }
   public String toStrig(){
     return ("name:"+name+"\nauthor:"+author+"\nprice:
                +price+"\nnum_pages:"+num_pages);

      }
     }
 clas Bk{
 public static void main(String args[]){
  Scanner q = new Scanner(System.in);
  Book obj[] = new Book[10];
   int n;
   System.out.println("Enter the number of objects required
   n = q.nextInt();
```

```
for (int i=0 ; i<n ; i++)
 {
  obj[i] = new Book();
  obj[i].details()
  System.Out.println(" "+obj [i].toString());
  }
  }
  }
```

Output

```
Enter the number of objects required
1
Enter name of book
A
Enter author of book
B
Enter the price of book
2500
Enter the number of pages in the book
980
 name : A
 author : B
 price : 2500
 num-pages : 980
```

⇒ Using Abstract to override method [LAB-4]

```
import java.util.Scanner;
abstract class Shape{
  double dim1, dim2;
  Shape (double d1, double d2){
      dim1 = d1;
      dim2 = d2;
   }
  abstract double print_area();
 }
 class Rectangle extends Shape{
  Rectangle (double d1, double d2){
    super (d1, d2);
   }
  double print_area(){
   return dim1 * dim2;
  }
 }
 class Triangle extends Shape{
  Triangle (double d1, double d2){
      super(d1, d2);
   }
  double print_area (){
   return (dim1 * dim2)/2;
  }
 }
```

```
class Circle extends Shape {
  Circle (double d1, double d2){
   super (d1, d2);
  }
  double print_area() {
   return 3.14 * dim1 * dim2;
   }
  }
 class Demo4
   public static void main (String args[ ]) {
        Rectangle r = new Rectangle ( 5,10);
        Triangle t = new Triangle (5,10);
        Circle   c = new Circle (5,5);
         Shape s;
          s = r;
        System.out.println (" The area of Rectangle: +s. print_area
                                                    ());
 s=t;
 System.out.println("The area of triangle: +s. print_area());

 s=c;
 System.out.println(" The area of circle : +s.print_area ());

 }
}
```

Output :-

The area of Rectangle : 50.0

The area of triangle : 25.0

The area of circle : 78.5

LAB - 5

⇒ Using A Bank class to derive Savings and current accou

```
import java.util.Scanner;
    class Bank {
        public static void main (String args[]){
            boolean nxt = true;
        Scanner sc = new Scanner (System.in);
        while (nxt) {
        System.out.println("Enter 1 for 'Saving Account'");
        System.out.println("Enter 2 for 'current Account'");
System.out.println("Enter the type of account");
    int n = sc.nextInt();
    String s = sc.nextLine();
      if(n==1){
          Sav_acct ob = new Sav_acct();
        System.out.println("Enter name");
        ob.name = sc.nextLine();
       System.out.println("Enter account number");
       ob.accno = sc.nextInt();
       ob.acceptBalance();
       ob.display();
       ob.Compute();
       ob.withdraw();

    }
     else {
        Cur_acct ob = new Cur_acct();
      System.out.println("Enter Name");
    ob.name = sc.nextLine();
     System.out.println("Enter acc number");
      ob.accno = sc.nextInt();
```

```
ob.acceptBalance();
ob.checkmin();
ob.display();
ob.withdraw();
}
System.out.println("Enter 1 for next costomer, Enter 2 to end");
int c = sc.nextInt();
if (c==1)
continue;
else
nxt=false;
}
}
}
class Account{
String name;
int acno;
String acctype;
}
class Curr_act extends Account{
double balance;
void acceptBalance(){
Scanner sc = new Scanner(System.in);
System.out.println("Enter deposit amount");
double d = sc.nextDouble();
balance+=d;
}
void display(){
System.out.println("Balance:+balance");
}
void withdraw(){
Scanner sc = new Scanner(System.in);
System.out.println("Enter the amount to withdraw");
int w = sc.nextInt();
balance -=w;
System.out.println("Balance:+balance);}
```

```
}
void checkmin(){
    if (balance < 500){
        balance -= 50;
System.out.println("Servic charge of Rs. 50/- has been imposed");
System.out.println("Balance after deduction :"+balance);
  }
  else
   return;
}
void chqbk(){
    System.out.println(" Name : "+super.name);
 System.out.println("Account Number : "+super.accno);
 System.out.println("Balance : "+balance);
Sy stem.out.println("Account type : current account");
 }
}
class Sav_acct extends Account{
    double balance;
    void acceptBalance() {
      Scanner sc = new Scanner (System.in);
System.out.println("Enter deposit amount");
    double d = sc.nextDouble();
     balance += d;
 }
 void display(){
  System.out.println("Balance :"+balance);
 }
 void compute(){
    Scanner sc=new.Scanner (System.in);
 System.out.println("Enter duration in months");
    int n = sc.nextInt();
      balance += (0.025*n);
   }
```

```
void withdraw(){
    Scanner sc = new Scanner (System.in);
  System.out.println ("Enter amount to withdraw");
     int   w = sc. nextInt();
        balance -= w;
      System . out . println ("Balance :"+balance);
    }
    void chqbk(){
          System .out .println ("Name :"+super.name);
          System . out println ("Account Numbe :"+super.accno);
        System.out.println("Balance :"+balance);
        System out .println ("Account type : Saving account");
        }
    }
```

Output

```
Enter 1 for 'Saving Account'
Enter 2 for 'Current Account'
Enter type of account
1
Enter name
Puneeth
Enter account number
125
Enter deposit amount
125000
Balance :125000.0
Enter Duration in months
16
Enter amount to withdraw
23456
Balance : 101544.4
Name : puneeth
Account Number 125
```

Balance 101544
Account type : Saving Account
Enter 1 for next customer, 2 to end
1
Enter 1 for Saving Account
Enter 2 for Current Account
Enter type of account
2
Enter Name
Pareeth
Enter acc number
157
Enter deposit amount
152000
Balance : 152000.0
Enter amount to withdraw
32654
Balance : 119346.0

Name : Pareeth
Account number : 157
Balance : 119346.0
Account type : Current account
Enter 1 for next customer, 2 to end