# OOJ Lab Record-

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## LAB 1-

Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c =0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

```
Lab 1 Program
                  jour util . Scarner;
temport impart
class quadratic
    public to static void main (String args [] ) }
          double a, b, c, disc;
           double 71, 72;
         Scanner inp = new Scanner ( System. in );
System. out. prinkln("tates a value for a,b, c: >>>>
         a = inp . next Double ();
          b = inp. next Double ()
          c= isp nerthousle ();
          dix= ((b*b) - (4 + a + c));
         is (disc>0) {
  System out printer (" roots are real ");
       n1 = (-b + Math. sqrt (disc)) / (a+a);

n2 = (-b - Math. sqrt (disc)) / (a*a);

System. out. println ("91"= x1 + "n2" + n2);
   elue is (duic == 0) }
       System. out. printle (" roots are real and equal");
       71 = 72 = - b/(2 + a);
         aystem out printly ("
```

```
c:\workspace>javac quadratic.java
c:\workspace>java quadratic
Enter values for a,b,c:
1 -4 -10
roots are real
r1=5.741657386773941r2=-1.7416573867739413
c:\workspace>
```

```
c:\workspace>javac quadratic.java
c:\workspace>java quadratic
Enter values for a,b,c:

1 -3 -10
roots are real
r1=5.0r2=-2.0
c:\workspace>javac quadratic.java
c:\workspace>javac quadratic
Enter values for a,b,c:

1 2 3
no real roots exist
```

### LAB 2-

Develop a Java program to create a class Student with members usn, name, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student.

```
Anity Prasad
   Lab 2 program
 import. java - util . Scanner;
 class Student
    String name;
   String usn;
    int manks [] new int [5];
   ; [57] the crea : [] abbut the
    int grade = 0;
     double hotal = 0;
 word get_delauls ()
  Scarrer in = new Scarrer (System is);
  System. out. printle ("Enter Student Name: ").
  name = in. next();
  System. out. printle (" Erter the USN: ");
   System out printly (" Enler the no of subjects: ");
   n= in nexthat ();
   System. out printer (" Erden wedde")
   fon(i=0; i<n; i++)
                          a credits for subject "+ (i+1)+": "1;
    System out grunds (" Enter credits: ");
     lon (1-0; i < n; i++)
    Greats [i] in nextent ();
3
       System out pounts (" Eiler marks:");
for (i = 0; i<n; i+1)
3
```

```
System: out printly (" Marks in subject "+ (is)) " : "),
marks [i] in neather ();
,5 wid calculate - s goa ()
   fon (i = 0; icn; in)
   ig (moster [1]>=90.44 moster [1] <=100)
       goode - 10;
   else ij (marks [i] >= 80 ft marks [1]<=90)
     grade = 9;
   else if (marks [i] >= 70 ff marks [i] <- 80)
     grade = 8;
  when if (marks [i]>=60 H marks [i] <= 30)
     grade = 7;
  else ig (marks [i] >= 50 48 marks [i] <= 60)
   else if (maily [i] > = NO HA marks [i] <= 50)
     grade = 5;
   else if (manus[i]>= 30 44 marks [i] <= 40)
       grade = 0;
   clase y/marks[i] y= 20 44 marks [i] X = 30)
      grade = 3;
   use is (marks (x7> - 10 44/marks (1) x = 20)
       made = 2;
   was in converted >= 0 for manus tid
  System - out printer (" Invalid marks enlared " );
   total - total + ( grade " evidets tis);
```

```
· letal : tool /20;
System. Oil printle ("Sopa = " + rola);
Void student_information ()
    System out prints ( Name : "I name );
    System out grandler (" pausn: "+ usn);
    System - out printled "Marks of exactle of all subjects: ");
    for (1.0; isn; i++)
    System out printly ("Surject: "+ (in)+":");
"(" Marks: "+ marks (i);
"(" Gudds: "+ oxedub (i);
   3
       (edulate _ sapal);
      public static void main strong args []
     Student s= new Student ();
     5. get_detaile();
     5. colulate_sapal);
     5 Student - information ();
```

```
Enter Student Name:
ANITEJ
Enter the USN:
1BM19CS194
Enter the no. of subjects:
Enter Subject credits:
Credits for subject1:
Credits for subject2:
Credits for subject3:
Credits for subject4:
Credits for subject5:
Marks in subject1:
56
Marks in subject2:
Marks in subject3:
76
Marks in subject4:
57
Marks in subject5:
90
```

```
Name: ANITEJ
USN:1BM19CS194
Marks & Credits of all subjects:
subject:1:
Marks:56
Credits:3
subject:2:
Marks:65
Credits:2
subject:3:
Marks:76
Credits:4
subject:4:
Marks:57
Credits:3
subject:5:
Marks:90
Credits:2
```

```
Sgpa=5.25

(program exited with code: 0)

Press any key to continue . . .
```

### LAB 3-

Create a class Book which contains four 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.

```
Lab & program
                                                       Antes Procad
                                                        18M19(S194
 myork your ald ",
 clas Book ?
   String more, authors;
   double _ price ;
   Try wim - bades .
  Scannor in = new
  Scanner (System in );
Books) &
  System . Out . printle (" Enlos name of the Book:");
  nome: in next line ();
 System.out. printh ("Euto grave name of author:");
  arilhon = in . nextline ();
  System out pointly ("Enter poute of book
  Price = in next Double 1);
 System out pireth ("Enter number of pages
 nun_pages = in nextn+ ();
 void show (){
 System - that . printle(" Name: "+ name ) ;
  System and printle ( " Another: " + author );
 System out print In (" hace: " + price );
 System . but paint In ("Number of pages : "+ num -pages);
               ", By "+ author + "for Rs" + price + "and
```

```
public static vold main (String [] angs)
   Scanner in = new
  Scanner Chysten in 1;
  wit n, x;
  System out println ("Enter number of books to be created:");
   n= in . nextInt ();
  Book B[] = new Book [n];
  for link i= 0; 1 < n; i+1) &
    System . out . printh ("Book" + (i+1));
    B[1] = new 800 K();
    System. out. printle ();
    for (int i=0; i<n;j++) &
      System out print In ("Book" + (i+1));
     B[i] : new Book (1;
      System out printly ();
      for (int i = 0; j < n; 1++) {
      System out print " Book "+ (i+1)).
      System aut printh (BCL);
      System - out - printly (1;
       System out pointle ("Enter the Brok number whose details you
 want to dusplay: ");
```

	k = in . next lat (); [] ( rat ) according to the sales	
	a . / 4 (1 LL x )n / 1	
	( 17 ) ():	
	3 ( a many)	
	\(\text{}\)	
	( x , 0 des	
's bib	Dellar and printle ("Enter number of house to be on	
	[ [ Nove Wen - [ ] & Nove	
	3 (min 1 = 0 = 1 min 1 m	
	System our francis (" book" + (111)).	
	(UX and won - [1] &	
	(C) Ning to may?	
		L
	y .	
	Backers, isnijiri) t	
	(((1)) ("3 (d") alport to my?	
	Blat : Mari Rock D)	
	Walnut to may	
	3 ( 111 ( 0 - 1 - 0 + 1 1/2) -?	
	( ( ( ) ) + Son I a some ten and	
	( [238] silmeta to well 2	
	C((1)) + " deal ") a source the multiple ((1)) 2 deal of the multiple (1) a source the multiple	

```
Enter number of books:
book 1
Name of book:
the adventure
Name of author:
william
Price of book in Rs:
Number of pages in the book:
678
book 2
Name of book:
the oath
Name of author:
wordswoth
Price of book in Rs:
450
Number of pages in the book:
456
```

```
book 1
the adventure, By william for Rs.300.0 and has 678 pages

book 2
the oath, By wordswoth for Rs.450.0 and has 456 pages

Enter the book whose deatils are to be shown:
2
Name: the oath
Author: wordswoth
Price: 450.0
Number of pages: 456

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

Press any key to continue . . .
```

## LAB 4-

Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea(). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea() that prints the area of the given shape.

```
Laby - program
                                                                      Anily froid
                                                                       18m19cs194
import gain util . ;
import join long.
obstract class Shape ?
 Scanner in = new
Scanner (System. in);
  int a1, a2;
 Shape () &
  System out println ("Input 2 sideger values:");
   al : in - next Int ();
    02 in . next (not);
    abstract void print Anea ();
 class Rectangle extends Shape 2
       void print Area () ?
   System. Out. printhn (" Rectangle: "+ a1 " a2 );
3
3
 does circle extends Shape &
    word print Area () &
   System out println ("(wile 1: "+ (3.14 * a2 * a2));
System out println (" (wile 2: " + (3.14 * a2 * a2));
```

vi id	day test Abstract &	and the second			
P. CO.	public static void main (Strma [] angs)				
	Shape s;	, * The part of the			
	S: new Rechangle ();	Y Mark May 1.3			
	S. print Area (1)				
		Superior and their			
	5 new Redangle ();	WAIT T- CH (1990)			
	S. print Area ();	( ni may ) one			
		1 1 1 10 10 10			
	s = new Circle ();	377 gull			
	s. print Asia Os a gabie & bugal a holany to ordine				
	3	Otoldson as I'm			
	3	Children on the			
	Variation him turned				
+					
		f goods whose synchol was			
		3 () and lowy here			
	1(42);	Syram Date printer (" Redougle " ) as			
+					
		day with other Shape 5			
-		FC) and town how			
	* 11 0/11	". I stime" who we make I.			
	((CD 4.00 P) 7) 1	· S stray allowing to mary			
	COSO SI MILH	2 2002 J Turkey My Mary			

```
Input 2 integer values:

1 2
Area of Rectangle : 2
Input 2 integer values:

3 4
Area of Triangle : 6
Input 2 integer values:

5 6
Area of Circle : 78.5

Press any key to continue . . .
```

#### LAB 5-

Develop a Java program to create a class Bank that maintains two kinds of account for its customers, one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class Account that stores customer name, account number and type of account. From this derive the classes Curr-acct and Sav-acct to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks: 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 Check for the minimum balance, impose penalty if necessary and update the balance.

```
Lab 5. program
                                                   Anulij Prasad
                                                      lemiqcs194
ungon jour util.",
                                                        Ajus
imposit java long. +;
class Account?
   Storing name, abc;
   int acc No;
   chan acc Type;
   double deposit; and my less of allow here out?
    Scanner in : new 1 may 1 1 1 1 1 1 1 1 1
    Scanner ( System in ) jobs will go and the
 void uput_data () { ( " ) 3 . H ) alyon be well
    System out println ("Enter your account lype (5/c):");
         abc = in next Line ();
        actinge = abc. char Atlo7;
   9
  void deposit () &
                     I would be to the
    System out. print in ("Enter an amount to deposit: ");
       deposit in next Double 17;
      bal + = depasit;
       System out println ("Balance has been updated.
  3 () shalad _ view bion
   System out printly ("Balance " + bal);
```

```
public static void main (String [] args)
    Scanner S: new
   Scanner (System in );
   Account a1 = new Account ();
   al input data (1;
   A (as acctype == '¿ 11 as acctype = " ¿') }
   Current a2 = new Current ();
   S ab
   System out print in ("Welcome to your current Account ");
   System out println ("1. Deposit");
   System out prints ("2. Check Balance");
   System out pronth ("3. Issue Chaque ");
    System . out .println("4. Exit");
    System out priviles (" Enter your chaire ");
    x = s. nextint();
    switch (x) {
     (are 1: al. deposit ();
     break;
    case 1: a 2. check - balance ();
   I break; I some as and I were the may?
     Case 3: a2. issue - cheque ();
    Case 4: System . exit (0);
     break;
    default;
           The the water by alling the way
  System . Out . pricatle (" Error, Invadid choice ");
I while (x <= 4 +4 x>=1);
```

```
esse ig(a1. acc type == 's' | 1 a 1. acc type == 's') }
    Savings a3: new Savings (1;
    doi
        System out printing Welcome to your savings Account ");
        System out println (" 1 Deposit ");
        Sys lem. out println ("2 - View balance");
         System out printer ("8 - Withdraw");
         System out printly ("4. Calculate compound interest");
         System out printer ("5. Exult");
         System out printle (" Erder your choice :");
        x: s- nextler();
         Switch (x) 2 1 sound than a sound
         case 1: a3. deposit (1;
         break; view (ase 2: a3. check - balance ();
          break; al. withdraw balance cove 3: al. withdraw balance
           Case 4: System . ext (0); as compute_ (1();
           break;
           default: Eyelem out princin ("Fracon. Invalid Choice");
           Case 5: System. exit (0);
           break;
           default: System out puints (" Error . Invalid choice ");
3 while (x <= 541 x>=1);
    System out printle ("Invalid Account type");
else
```

```
class Current extends Account 2
   Current (1 }
  System out pruntle (" Enter your name: " );
   name = in . nextline (1;
  System aut. privally ("Enter your Account number: ");
      acc No = un-next Int ();
    deposit ();
  double chq_amount;
   voit More _ cheque () {
   System out printh ("Enter amount for which chaque is to be
  issued . "1;
   thegor the amount in next Double ();
   of (chq = amount > bal ) {
  & System out printer ("Erron ! Insufficient balance in account ");
  else {
   bal chq - amount;
  System out printle (" Cheque has been issued successfully");
void check_balance (18
  occ) > 18
  System out printly ("Current available balance is lesser-than
muramem regioned balance ?);
  bal = 100;
 System out printh ( Service charge of Rs. 100 how been deducted
from your phone balance ");
 View - balance!);
```

```
class Sovings extends quount?
  double (1, withdrawal_amount, time;
 Savings () &
 System out pruntly ("Enter your name: ");
  hame in nextline ();
  System out prints ("Enter your account number .");
   accNo: in. nextInt();
    deposit (1;
void compute_c1() {
   System out println ( - Edus time period : ");
  time = in next nt (1;
   C1= bal * Malh . pow (1+ (0.08/12), 12 - lime ) - bal;
   System . out printly (" ( = " + (1);
    balt = cl;
    System out pronth (" () has been deposited ");
void wilhdraw _ balance () {
 System . but . printly ("Erden the amount you want to withdraw :");
 withdrawal - amount : in next Double (1.
if (widthrowal _ amount > but ) &
  System out printle (" Exect! The extend amount is greater than
      available bolance "1;
  else &
bal = adhahawal - amount;
  System out printh (" Amount has been successfully withsourn");
3
```

```
Enter your account type (Savings/Current):
savings
Enter your name:
anitej
Enter your account number:
12345
Enter an amount to deposit:
200
Balance has been updated.
WELCOME TO YOUR SAVINGS ACCOUNT

    Deposit

2. View Balance
3. Withdraw

    Calculate compound interest

5. Exit
Enter your choice:
Enter an amount to deposit:
200
Balance has been updated.
WELCOME TO YOUR SAVINGS ACCOUNT

    Deposit

2. View Balance
3. Withdraw
4. Calculate compound interest
5. Exit
Enter your choice:
exit
```

```
Enter your account type (Savings/Current):
current
Enter your name:
anitej
Enter your account number:
12345
Enter an amount to deposit:
Balance has been updated.
WELCOME TO YOUR CURRENT ACCOUNT
1. Deposit
2. Check Balance
3. Issue Cheque
 . Exit
Enter your choice:
Enter amount for which cheque is to be issued.
240
Cheque has been issued SUCCESSFULLY
WELCOME TO YOUR CURRENT ACCOUNT

    Deposit

2. Check Balance
3. Issue Cheque
4. Exit
Enter your choice:
```