1. Lab Program:

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.

```
Algorithm :
step 1: Input the values of a, b ande
steps: calculate using formula
       d = (b+b) - (4+a+c)
step 3: 1F(2<0)
      Print: No real solutions
       else H(d=6)
      Pornt: Roots are equal
      Parint: 71=72 = (-6/2 *a)
       else
      Print: Roots are real
       Brint: 71 = -5+ Tal(24a);
      Bint: 22 = -6-12/(24a);
  Steph: End
```

import java. util. *

Mublic clast quad-noots

{

Public static void main (string args[])

{

double a b (cot, 211,21);

System-out prints ("Enter the values of a, b

and (");

scanner &= new scamer (system-in);

a = sc-next Double();

b = sc-next Double();

c = sc-next Double();

d = (btb)-(4tate);

```
Steph: End
```

```
* * Biogram
  imposit java. util. *
   hiblic class quad -noots
   Public state void main (string args[])
   double arbicoloniali
    System out printer ("Enter the valeur of a, b
    and (");
    Scanner &= new scamer (system-in);
    a = sc-next Double();
     b= sc-next pouble()
     c=sc-next pouble(1;
     d=(bxb)-(4xa+c);
     14 (9>0)
      n = (-b+ Math sgrt(d)) / (1+a);
      The (-6-Moth sgrt(d)) /(2+a);
      System . ad Part to ("nort 1 = "+ x1 + "nox2 "+72);
       else 1 (d= = 6)
       カニカニーレー(2+0)
```

```
ese

Lytem-cut-print ("noot = noot = "+n1);

ese

Lytem-cut-print (n ("There are no real solutions for given equation");

3

3
```

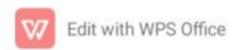
Scanned with CamSci

```
Enter the values of a,b and c

1
-2
1
Root1=Root2=1.0

...Program finished with exit code 0
Press ENTER to exit console.
```

Scanned with CamSci



2. Lab Program 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.

```
* Import sava-util. +;
 Mass student 1
   Bivate string osn:
   Private string name:
   Private the awaits D:
    pulvate hit market;
   livate into:
    void accept ()
      Scanner s-new Scanner (System-In);
      System-out Rintin ("Enter student details");
      System-out-mindin (" usw: ");
     usn=s=next();
      System-out-pointln("Name: "1)
      name=s-next ();
     system-oud-pristin ("Fitch audits and marks
     attained by the student in each subject "1;
      for ( ( to 1 = 0) ich ; it)
       audits[i] = siext mt0;
        monks[i]: s-nextint ();
        void displayed
```

System-out-printer ("student detailes");

System-out-printer ("USN:"+USNS;

System-out-printer ("Name: "+name);

System-out-printer ("Marks meach subject:");

For (inti-osion; i++)

L

System-out-printer ("Subject"+(141)": "+marks

Till;

double calculate ()



```
System-act-points ("Name:"+rame);

System-act-points ("Nauks m each subject:");

For lint 1=0; icn; i++)

double calculate c)

int tep=0, te=0;

for lint 1=0; icn; i++)

{

tr=tc+cudith[i];

if [marks[i] ==50]

l

tep=tep+(cemarks [i] | lot-standits [i]);

due te(marks [i]>=10 ss marks[i] ero)

i

tep=tep+(cemarks [i]>=10 ss marks[i] ero)

i

tep=tep+(cemarks [i]>=10 ss marks[i] ero)

i

tep=tep+(cemarks [i]>=10 ss marks[i] ero)
```

```
class Student Main

l Relate Steether void main ( string 550) {

Student SI= new student ();

Student SI: new student ();

System. oct. println ("SUPA: "+51. calculations")

3

3
```

```
C:\Users\Surendra\Desktop>
```



3. Lab Program - 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.

```
1. impost java-util. *;
   class Book {
       sking name;
       string author;
       int price;
       Int num-Pages;
        Book ()
         Book (string name, string author, int price, int num-pages)
           this name = name;
           this author = author;
           this . Price = Price:
           this num-pages = num-pages;
          void accept ()
          Scanner s= new scanner (system-in);
          system.our. paintlin ("Enter the name of book");
           name = s. next();
          System-out-paintin ("Enter the author of book");
           author = s-next();
           system.out. Parith ("Extenthe parce of the book");
           Portice= s. next int();
           system-out-Brintln ("Enter the number of pages of book");
            num-pages = sinextint();
            Rublic string to string()
            sustion ("Name: "thame + "In"+ "Acuthor: "+ author + "In"
            + "Palce: " + paccet "in" + "Number of Pages: "+num-pages;
```

```
Class Book Main {

Nublic static void main (string ssd)

{

Scanner a = new scanner(system.in);

Book bl = new

Book ("Wings of Five", "npt. Abduskalam", 100, 200);

System.out. Brintin ("Sample input: ln"+ b1);

System. Oud. Brintin ("Enterthe number of books");

int n = a.next int();

Book bl = new Book [n];

far(int i=0; icn; it+1)

{
```



```
name = s. next();

Jystem.out.printin ("fater the author of book");

author = s. next();

system.out.printin ("fater the author of book");

Price = s. next(nt);

system.out.brintin ("fater the number of pages of book");

num-pages = s. next(nt);

y

Public string to string()

i

sutturn ("Name: "tname + "In"+ "Houthor: "tauthor + "In"

+ "Palce: "+pricer" in "t" "Number of Pages: "tnum-pages;

y

Class Book Marn {

Public static void main (string ssp)

{

Scanner a = new scanner(system.in);

Prook b(= new)
```

```
Rubbic Harte void main (string stal)

{
Scanner a = new scanner(system.in);

Book bi= new

Book ("Wings of Fire", "APT-Abdukalam", 100,200);

System.ord. Faintlin ("Sample input: In "+ bi);

System.ord. Faintlin ("Enter the number of books");

int n. a.next hat 0;

Book D= new Book [n];

factint 1=0; icn; it+1)

{

beij=new Book [;

System ord. Ruintlin ("Enter the details of "+ (1+1)+"

book");

brij-accept(3;

3

food int r=0; icn; it+1)

{

System.ord. Ruintlin ("Details of book" + (1+1);

System.ord. Ruintlin ("Details of book" + (1+1);

}

}

}

}

}

}

}

**Book tenus

**Book = new

**Book
```

```
Came
Enter the author of the book
shahid
Enter the price of the book
890
Enter the number of pages of the book
67
Enter the details of 2 book
Enter the name of the book
Overstory
Enter the author of the book
Richard
Enter the price of the book
890
Enter the number of pages of the book
789
Details of book 1
Name: Game
Author: shahid
Price: 800
Number of pages: 67
Details of book 2
Name: Overstory
Author: Richard
Price: 890
Number of pages: 789
C:\Users\Surendra\Desktop>
    C:\Users\Surendra\Desktop>
                                                                                                                                                                                                                                                                                                                                                                                                                                            .
```



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.

```
Sorat watht. B
                                                        IBMIR CSORE
                                                        Week &
1. Import java . util- scanner;
    abstract class shape
     Tot aub:
    abstract vold printAreaco;
     class Rectangle extends shape
      Void paint Arca()
      System out Patritin ("Area of Rectangle = "+10+16);
      class Triangle extends shape
      wold Printareal
      system out minten l'Area of Triangle = +10-5 athil);
       class chide extends shape
       void point Pred or
       System-out-Paintin ("Area of Circle - "+(714) + a + L))
```

class shapemain

```
class Shapemain
Rublic static void main (string orgets)
scanner sc= new scanner (system-in);
Rectangle 1= new Rectangle ();
Triangle + = new Triangle();
(incle ( = new circle ();
   System out Println ( "Enter length and breadth: ");
    ( a = w.neitint ():
    ILLESC MERTINECT
    To prior Area ():
   System-out-printin ("Frotes height and base: "):
    to a schextIntO
    t. b = ac-nextInt();
     1- Print Preaco:
     System out mintin ("Enter radius: "))
     Cassementar();
     C-Print Area Co;
```

```
Enter length and breadth:
5 6
Area of Rectangle=30
Enter height and base:
5 9
Area of Triangle=22.5
Enter radius:
3
Area of Circle=28.278
```

Scanned with Cardicarrer

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: • Accept deposit from customer and update the balance. • Display the balance. • Compute and deposit interest • Permit withdrawal and update the balance • Check for the minimum balance,

impose penalty if necessary and update the balance

```
import java util scanner,
 class account
 Private string name:
 Private long account number:
 Private int account - type:
double botante;
 void get - datals
 Scanner is = new scanner (system in)
System-out Println ("Enter the name")
 Name assinexter;
Justim and Paintin l'enterthe account number 1;
account number = some celonges;
systemicus Picialin ("Choose the account type of
System out. Println (" ) Savings account ");
System-out Print ( 2. ament occount );
                                          Scarned with Carolicatory
```

```
account typess.next2ne())
inteller account typics
 retion account type;
class savings extends account
 scanners: new scanner (system-in),
 darble amount;
 Voidget-sax balance ()
 System out Printing "Enter the amount to be placed in your
 savings account");
 amount = screek Double ();
 balance + - amount?
  void display - sav - bince ()
 System-ocd Phintle ("balance: "+ balance);
  roid compute sav intensec)
  system. Out-Paintle ("Indeest of I'x shall be added to your
  balance 1/2
  balance balana + (or + balance);
  Fold with drawl save
   System out Paintal "Exter the amount to be withdrawn -13
   amain: ss-next Doubers
                                          Storonel with Condicional
```

```
balance = balance - amount >
day amend extends account
scanners : new scanner (systemia),
double amount;
Frat double min-balance = 5000;
Void get tur balance )
by tem out Printer "Enter the amount to be placed in your
 account "b
Amount = so next Double ();
 balance + - amount;
 worldisplay-act-blacect
 3-premiord fruitto ("basances"+balarro);
  void compute-cur_service-changes()
  15 (balance mm balan e)
   Intermediate Person l'source tour of 15.500 shall be levert
   balance balance-5000
    die
```

Sourced with Conditioner

```
systemous Parallal minimum balana is maintained !
 Void withdrawal (101)
Switch-out-Printen ("Extu the amount tobe withdrawn");
 amountes = next Double ();
 balance: balance-amount;
 tlass bantmain
 Exhic state void main (string args 11)
  in types
  System out Princip ("Enter the bank details");
  allowed account (3)
  all get data();
  tupe = acc. (ctur. account_type ();
```

```
Standard with Conditioners
systemous Publisher minimum balana is maintained its
 Void withdraws aux )
Swtem-out-relation ("Enter the amount to be withdrawn);
 amoundes a next Double ();
 balance: balance-amount;
 tlass bankmain
  Estivic state void main (string args 11)
  int type:
  System out Printer ("Enter the bank details");
  account account ();
  all-get-datall;
  type: acc, tetur account type ();
  # ( type = = 1)
   System and printer ("SAVINGS ACCOUNT");
   savings care new savingst);
   Jav-set_sav-balance();
   lav-display-sav. line ();
   Saviompute-sav intenst();
   tax display - sax blace ();
    Sav withdraws-saver;
    Sau display - sav_blage);
                                         Scannel with Continuous
```

```
the fighter = 2)

the system and Prints ("CORPERT ACCOUNT");

and the continue cont
```

Scarved with Caroliconner

```
enter the bank details
enter your name
priya
enter the account_number
35259767
choose the account type
1.savings account
2.current account
1
SAUINGS ACCOUNT
enter the amount to be placed in your savings account
5688
balance=5688.0
interest of 5% shall be added to your balance
balance=5972.4
enter the amount to be withdrawn
678
balance=5294.4
```

Scannel with Conficement



