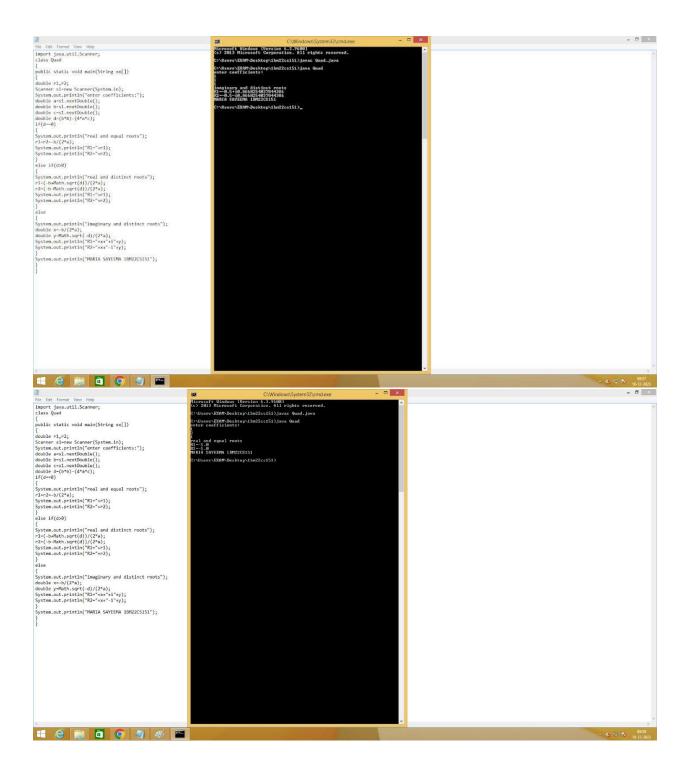
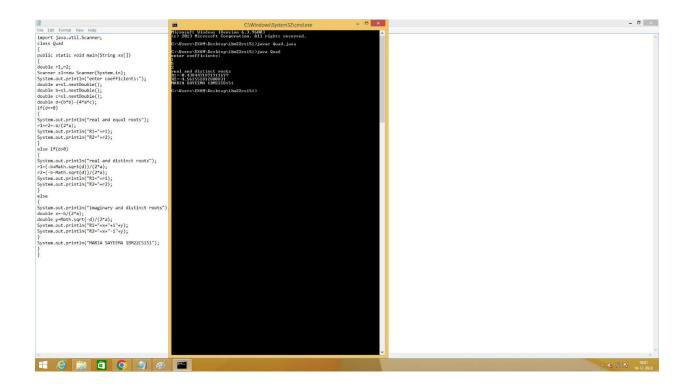
Program 1:

Develop a Java program that prints all real solutions to the quadratic equation ax^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 that there are no real solutions.





```
import java . will barner;
                         PROGRAM 1: Quadrock Egnation
    clas Quad.
    public static voil mount SHPy XX []
ILLE
    but 1, 12;
Till
   Scanner St= new . Scanner ( System . in);
   System coul prently (" Enter coefficients !);
    double a = Sl-MxtDouble ();
    double b = SI - Way+ Double 15;
    douter = sl. Maxt Douter;
    touted = (b*b) - (u*a*c);
    i( cd = =0)
    system · out · println (" real and equal rook");
     TI= T2 = - 6 (2 0);
    System . Out of 19nt line " RI ="+TID;
    bysten . out . provien ("R2="+12);
    else of (d>0)
    System.out.println("real and litent rook");
* vi. C-b+ Nath. systed)/(2xa);
= 12. C-b-Ham. sqrf(d))/(200);
    System out prouter ("Rz=" +rz);
50
64
   else
60
system - out -printly = " maginary and during rook");
   do usu x = - b/(2 + a);
& but y = Mam. sqrtcd)/(27a);
E bytam = out . printer (" RE" + X + " 9" + y);
       Scanned with CamScanner
```

Denter welficient: imaginary and lathout roots

R1 = -0.5 + 10.8 (60254037864385) "R1 = -0.5 - 10.8660254037844386 that the street was art should be also the market penter wellswarks: predical constitution of AND THE 1 1 c 11 - (11 1 1 c - 1) real and equal roots 21: -1.0 R1=-1.0 CALLED THE SEA SHOT STANDING SECTION 1 con by welling to: the Willer deres 13 " fail to left to some (see = 17 Inthrop = inc - year real and lisher roots R1 = -0.4384471871911697 ex=4.56155281286883) the the box god "to be going on your LEAST CLOTHER WINDS Circa card of all to gardens as April to had applied CS Scanned with CamScanner, . .

Program 2:

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 java.util.Scanner;
class Student {
   private String usn;
   private String name;
   private int[] credits;
   private int[] marks;
   int number;
   public Student(int numSubjects) {
       credits = new int[numSubjects];
       marks = new int[numSubjects];
    public void acceptDetails() {
       Scanner scanner = new Scanner(System.in);
       System.out.println("Enter USN: ");
       usn = scanner.next();
       System.out.println("Enter Name: ");
       name = scanner.next();
       System.out.println("Enter The Number of Subjects: ");
        number = scanner.nextInt();
        credits=new int[number];
        marks=new int[number];
       System.out.println("Enter details for each subject: ");
       for (int i = 0; i < number; i++) {
            System.out.print("Enter credits for Subject " + (i + 1) + ": ");
            credits[i] = scanner.nextInt();
            System.out.print("Enter marks for Subject " + (i + 1) + ": ");
            marks[i] = scanner.nextInt();
       }
    }
   public void displayDetails() {
```

```
public void displayDetails() {
    System.out.println("USN: " + usn);
        System.out.println("Name: " + name);
        System.out.println("Credits and marks:");
        for (int i = 0; i < number; i++) {
    System.out.println("Subject " + (i + 1) + ": Credits - " + credits[i] + ", Marks - " + marks[i]);
   public double calculateSGPA() {
        int totalCredits = 0;
        double weightedSum = 0.0;
        for (int i = 0; i < number; i++) {
             totalCredits += credits[i];
             weightedSum += calculateGradePoints(marks[i]) * credits[i];
        return weightedSum / totalCredits;
   }
   private double calculateGradePoints(int marks) {
        if (marks >= 90) return 10.0;
        else if (marks >= 80) return 9.0;
        else if (marks >= 70) return 8.0;
else if (marks >= 60) return 7.0;
else if (marks >= 50) return 6.0;
        else return 0.0; // Failed
   }
oublic class Main{
   public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the number of subjects: ");
        int numSubjects = scanner.nextInt();
        Student student = new Student(numSubjects);
```

```
public class Main{
   public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the number of subjects: ");
        int numSubjects = scanner.nextInt();

        Student student = new Student(numSubjects);

        student.acceptDetails();
        System.out.println("\nDetails of the Student:");
        student.displayDetails();

        double sgpa = student.calculateSGPA();
        System.out.println("\nSGPA: " + sgpa);

}
```

```
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\EXAM\Desktop\1bm22cs151_2\javac Main.java

C:\Users\EXAM\Desktop\1bm22cs151_2\javac Main.java

C:\Users\EXAM\Desktop\1bm22cs151_2\javac Main.

Enter USN:

1bm22cs151

Enter Name: maria

Enter The Number Of Subjects: 5

Enter details for each subject:

Enter credits for Subject 1: 70

Enter marks for Subject 1: 70

Enter marks for Subject 2: 3

Enter marks for Subject 2: 80

Enter credits for Subject 3: 70

Enter credits for Subject 4: 2

Enter marks for Subject 4: 80

Enter credits for Subject 5: 4

Enter marks for Subject 5: 70

Student Details:

USN: 1bm22cs151

Name: maria

Credits and Marks:

Subject 1: Credits - 1. Marks - 70

Subject 2: Credits - 3. Marks - 80

Subject 3: Credits - 4. Marks - 70

Subject 5: Credits - 4. Marks - 70

SCPA: 8.357142857142858
```

```
LAB PROGRAM: 2: Develop a Java program to create class student
           with members usn, hamo, an array credets, an array morks. Include
1/1/24
          methods to acup and display detalls and method to adulate
          SGPA 9 a student:
           INPUT
         import java who becomes
         class shudents
             private String USN;
             private String name;
             private Pat I I credits;
             Private int [] morks;
              int number;
             public Student Sking usn, Shing name, that I credits, ind I
              marks){
                 this ousn = Using
                 Mis . name = name;
                 Wis credits = credits;
                 Min works = mork;
            public void any Dodoshil) {
                Hanner scanner = new Stanner (System. in);
                Sycam.out.privaln ("Ender Usivi");
                NEW = 8 CONNEY. MUST C);
                System out . fried on (" Enter rame: ");
```

Scanned Wills Commismenters;

```
bystem.out println ("Enter The Number of Subjects);
                   number = Samur. next Int ();
                   credits = New "wt [ humber];
                   marks = new Put [number];
                  buxtum.out println ("Entr disails for each subject.");
                  procint 1=0; 12 number; 1+1){
                      System out printen ("Enter credite for Lub jed"+
                      (+1)+":");
                                                                         6
                      credits [i] = Summer Mexe Int ();
                                                                         OF T
                      System. out. printentienter marks for subject "+ (1+1)+
                                                                         0
                                                                          0
                      maria [i] = blanur hixtlindes;
             busile void display behall () {
                                                                          bystum.ow.println("USD:"+USN);
                 bystam out printly ( Name: + name);
                 byther out privation (" ( in little and marks:");
                 torci=0; iLnumbergi++) {
                     System.out.println(" Subject"+ (i+1)+ ":credit-"
                     + cridet [i] + ", Marks =" + marks [i])
CS Scanned with CamScanner
```

```
public double calculates of a double brack (refer - 0; double we grand Sum = 0; bt of Coo; in number; if the following the constitution of the con
                                                                                                                                            public downe calculatisaPAC) {
                                                                                                                                                                            double was grandsum = 0;
                                                                                                                                                                         for (60 ) ; FNMMprz . 18++) {
                                                                                                                                                                                                        bt a) (redite += (redits [i]
                                                                                                                                                                                                        we gribed bum+= Calculated grade books ( Feet marks [i])
                                                                                                                                                                          return weighted sum/total Credita;
                                                                                                                                        private double abulatelyrade brints and marks) &
                                                                                                                                                                                                  fdx of (mark 2=80) {
return 9.0;
                                                                                                                                                                                                 else of construction >= 70 ){
```

```
elber

**return 0.0;

}

Public class Hown {

public Startic Void morn String [1 args) {

Indent student = her Student ("", " ", null, null);

budent a culptochaile();

bustum = out printen (" \n student Details:");

student bupan Details();

bustum out printen (" \n sq 84:" + student (almost

Sq 40);

}
```

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IBMIZESIS)
ENLER Name:
HARIA
ENLER Me Number of Bubjects:
5
Enler dealls for each subject:
Enler cridits for subject: 10
Enler cridits for subject: 3
Enter cridits for subject: 3
Enter marks for subject: 30
Enler cridits for subject: 30

Enter marks (0) Subject 5: 70

Enter USN:

She dent Details:
She dent Details:
She's 1: (redits + 1 , Moths - 70
Subject 2: Credits - 3 , Moths - 80
Subject 3: Credits - 4 , Moths - 70
Subject 4: Credits - 2 , Moths - 80
Subject 5: (redits - 4 , Moths - 70

SGPA . 8-35714285714858

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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.

```
public class BookTest{
       public static void main(String args[]){
               Scanner sc=new Scanner(System.in);
                System.out.println("Enter the number of books:");
                int n=sc.nextInt();
               Book[] b=new Book[n];
                for(int i=0;i<n;i++){
                        System.out.println("Enter the details for book"+(i+1)+":");
                        System.out.println("Name:");
                        String name=sc.next();
                        System.out.println("Author:");
                        String author=sc.next();
                        System.out.println("Price:$");
                        double price=sc.nextDouble();
                        System.out.println("Number of pages:");
                        int numpages=sc.nextInt();
                        b[i]=new Book(name, author, price, numpages);
                System.out.println("\nDetails of books:");
                for(int i=0;i<n;i++){
                        System.out.println("\nbooks"+(i+1)+":\n"+b[i]);
       }
}
```

```
Enter the number of books:
2
Enter the details for book1:
Name:
maths
Author:
rakesh
Price:$
Number of pages:
156
Enter the details for book2:
Name:
java
Author:
ritu
Price:$
52
Number of pages:
1698
Details of books:
books1:
Name: maths
Author:rakesh
Price:$25.0
Number of pages:156
books2:
Name: java
Author:ritu
Price:$52.0
Number of pages:1698
```

```
cab-03 (veets a clar Book when contains pur numbers: vame,
                 author, by 94, num page Include a Constructor to set values to r
The members. Include methods to serom towns for the me det a es
of the object. In Jude to Strong () me must to lipping complete letails
1/1/24
                 of In book.
                 14801
                importion with banner,
                class Book 8
                     bring Stron rom.
                     Myste Shift onper!
                     Drivota darka privi;
                     (yellmen the storing
                     public box (Swignam, Stry anhor, doute price,
                    int numbers > 5
                        Mul. Namu=namu;
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                    Pat huralayes) s
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                       mi autor = author;
 2
                       Ma. prilu =prilu;
 2
 2
                      his . humlages = tum pays;
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```

```
Hopwhite 402d String get Details () {
                  return &"Ham:" +name + "InAuthor: "+ author
                  + "In Price : Rs" + price +" In Number of lyce:
                  humlages;
              Dublic Stray to Shaye)
                  1. year
          publicules box Tests
              Puth state vos mash (Shing [] anys) {
                  Starner & corner = new Starner (Cyptumin);
                  L': Wood & moment on returning foods: 2
                  ind n = scanner next Inder;
                  Book [1 books = News Book Ch]:
                  br (from 120; 12n;+41
                       Lyslam out printer in Enter Whal to book "
                       4 (3+1) + ": ").
                       dytum out println ("Name:");
                            ( rame = Suprier. rextx)
                       bystem. out-print ln("Author:")
CS Scanned with Cather graduar : Stander Wy Fro
```

System. out. prontinc" Proc. Rs";

double proc. blancer. Mext lower();

Suftem. out. println(" Whimberof Roger");

out numbers: sunner. next Inter;

book [i] = how book (name, awhon, price, number);

bythm. out. println("Indebacks of Books:");

proclination; Pen; 14+){

bythm.out. printly in Book" + (P+1) + "In" + bookers);

3

3

```
DUTPUT
     Enter no number of Books
     Enter hu ditails for book!
     Namu:
     more
     Author:
     Valush
     lau: $
     - 25
     Number of lagos:
      456
    Enter hu delails for books
    jara:
    Auhor:
    Lark
    Prou: 4
                                  8
    56
Number of laga:
   Details of books:
books1:
~ Navu: wahu
Author: Yahah
fr: u: $25.0
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```

DUTPUT

book 2

Namo: java Auhur: ram

Priu: 456.0

Number of Page: 259

1 9 Parang

CS Scanned with CamScanner

Program 4:

Develop a Java program to create abstract class shape that contains 2 integers and an empty methos printArea(). Provide 3 classes Rectab\ngle,Triangle,Circle,each extends class Shape. Each class contains only the methos printArea() that prints area of a given shape

Microsoft Windows [Version 10.0.22621.3007] (c) Microsoft Corporation. All rights reserved.

C:\Users\maria\OneDrive\Desktop\1BM22CS151>javac Rect.java

C:\Users\maria\OneDrive\Desktop\1BM22CS151>java Rect

Area of Rectangle: 50 Area of Triangle: 16.0

Area of Circle: 113.09733552923255

```
Dividop a Java program to ereate appear was stape
                  that contains 2 9n topers and empty method prout Areas s
froud a concer Rectarge, France, lande, each extends class shape
each clanes contain only her maked printhroof) hat prints
                   INFUT
                  abstract claus bhopse f
                     probable out deministrant;
                     protected and dimensions;
                     public ahshall-void priviAreal);
                  class Rectargle extends Shapet
                     partic Rectangle (Port langling, Port word M) ?
                        Super (Sugm, width);
                     resurations provided
                        int are: dimension 1+ dimension;
   0
                        System out provide (Avea & Rectangle: " tarea);
   -
   -0
   -
   -3
   -83
                  llass Tranga exends bhates
   -3
   -8
                     public Triangle (Put hour, int height) [
   -8
                        bupki (hav, hospit);
   8
    8
                     patte void Print Amac) {
    8
                        toute are a = 0.5 + demonstry 1 + dimension2;
    2
   2
                        System. Och proten ("Avro & Triange: "Harra);
    12
    2
           Scanned with CamScanner
```

class (Arche extends bloom)

public (Prod radous)

public voild printhrea()

double aroa = Mall. P1 * dimonsion (* dimonsion);

buttom. out printhn(" Areo of livels: "Hara);

hablic class Rect (public static voild main (String [1] args) (

Roch angle rectanger = now Rechanger ();

Triangle brianger = now Trianger ();

Crite circle = Mars ();

Printh circle = Mars ();

Milander printhrea();

bride printhrea();