OOJ Lab Record-

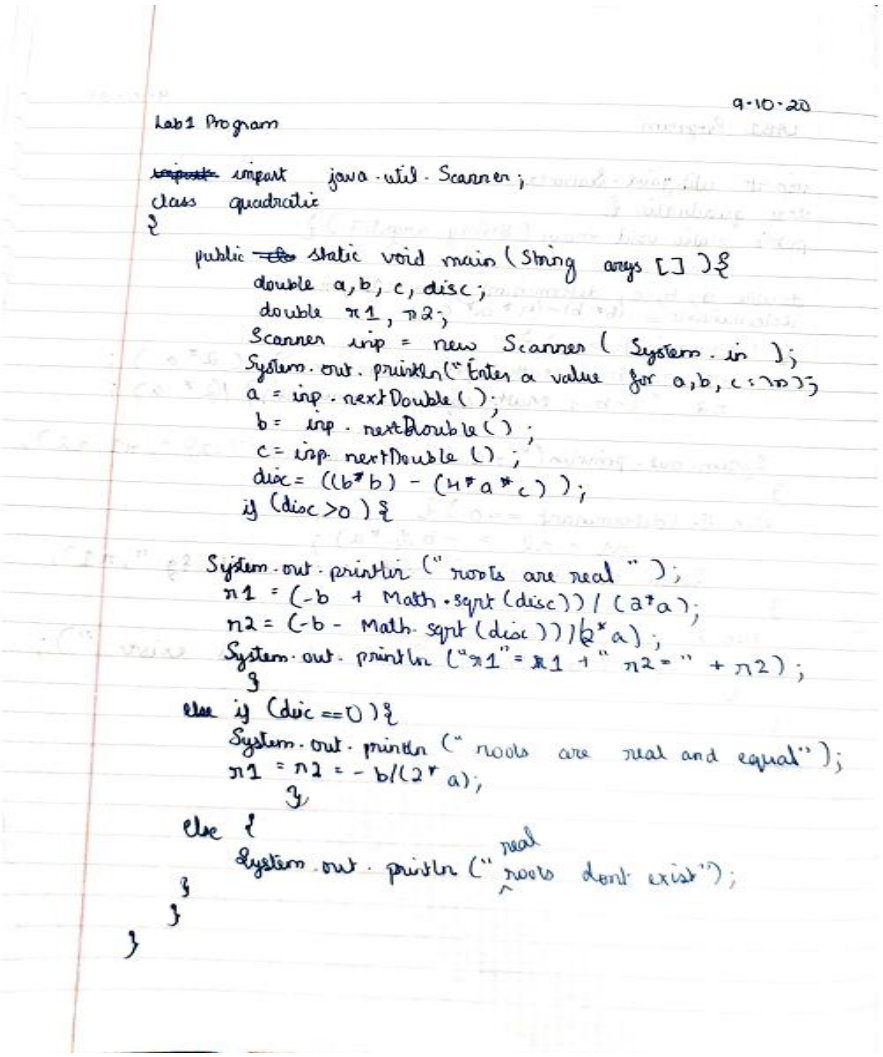
Anitej prasad

1BM19CS194

3-D

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.



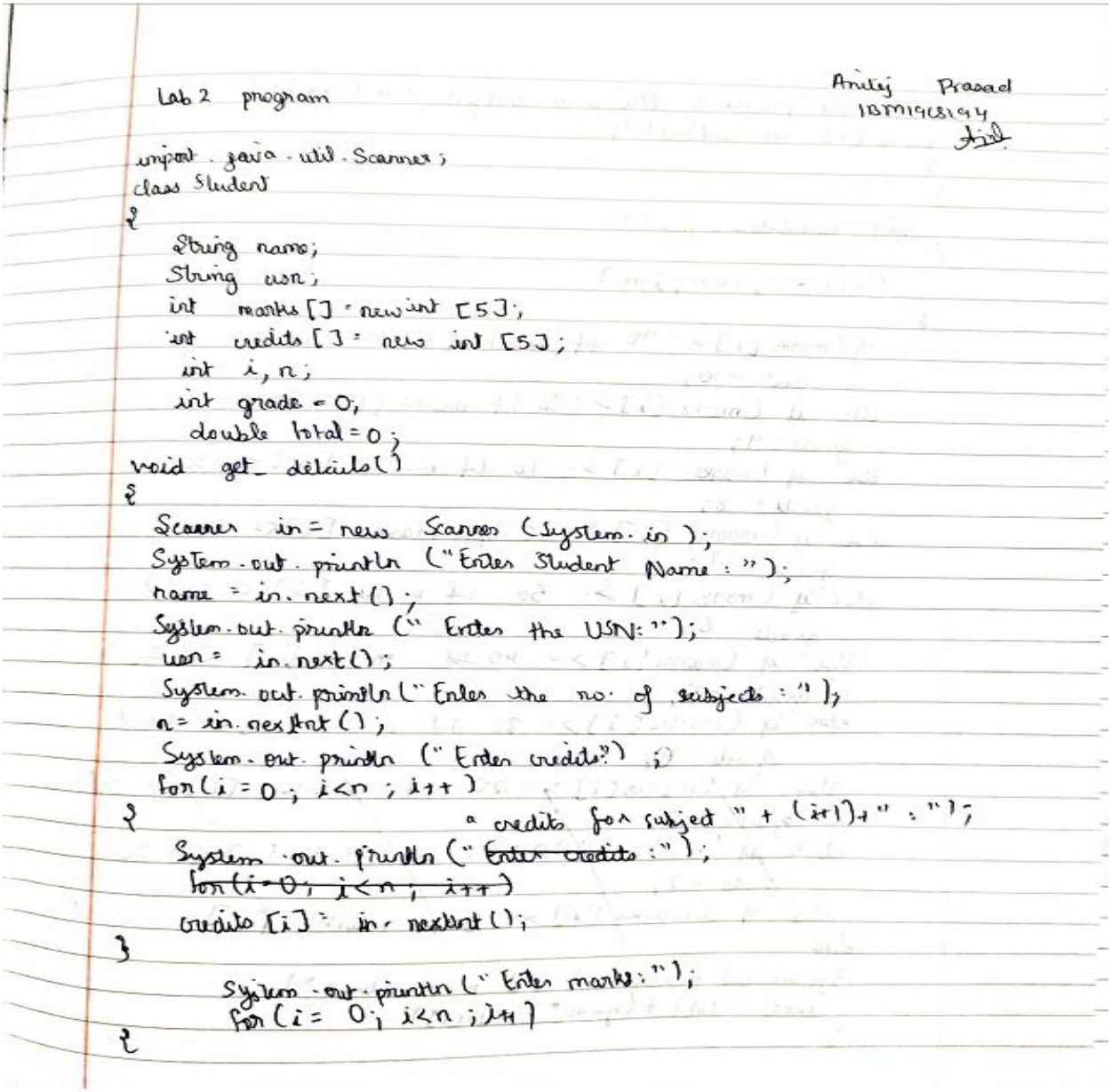
```
9-10-20
Lab1 Program

import java.util.Scanner;
class quadratic
{
    public static void main(String args[]){
        double a,b,c,disc;
        double r1,r2;
        Scanner inp = new Scanner(System.in);
        System.out.println("Enter a value for a,b,c:");
        a = inp.nextDouble();
        b = inp.nextDouble();
        c = inp.nextDouble();
        disc = ((b*b) - (4*a*c));
        if (disc>0){

    System.out.println("roots are real");
        r1 = (-b + Math.sqrt(disc))/(2*a);
        r2 = (-b - Math.sqrt(disc))/(2*a);
        System.out.println("r1"=r1+" r2=" +r2);
        }
    else if (disc==0){
        System.out.println("roots are real and equal");
        r1 = r2 = -b/(2*a);
        }
    else {
        System.out.println("real roots dont exist");
    }
    }
}
```

```
c:\workspace>javac quadratic.java

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

1 -4 -10
roots are real
r1=5.7416573867739 41r2=-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>java 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.



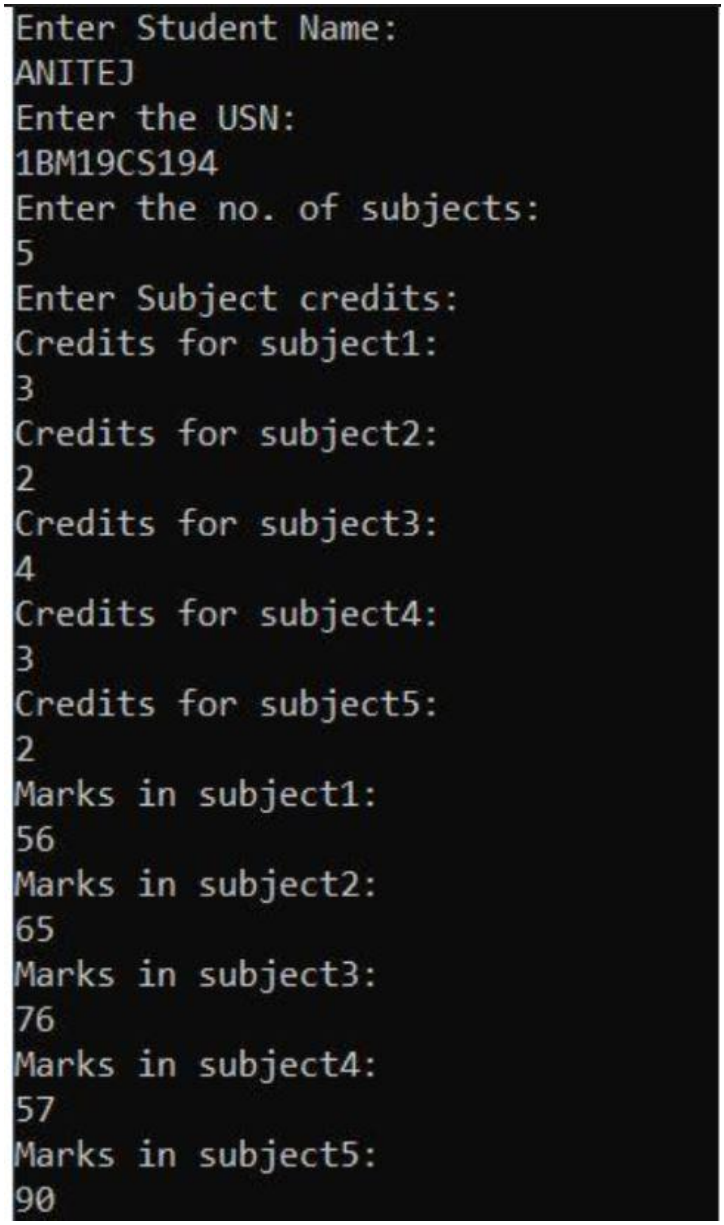
Lab 2 program

Anuj Prasad
1BM19CS194

```
import java.util.Scanner;
class Student
{
    String name;
    String usn;
    int marks[] = new int[5];
    int credits[] = new int[5];
    int i, n;
    int grade = 0;
    double total = 0;
void get_details()
{
  Scanner in = new Scanner(System.in);
  System.out.println("Enter Student Name : ");
  name = in.next();
  System.out.println(" Enter the USN: ");
  usn = in.next();
  System.out.println(" Enter the no. of subjects : ");
  n = in.nextInt();
  System.out.println(" Enter credits:") ;
  for(i = 0; i<n ; i++)
{                                  a credits for subject " + (i+1)+" : ");
   System.out.println(" Enter credits :");
   for(i=0; i<n; i++)
   credits[i] = in.nextInt();
}
        System.out.println(" Enter marks: ");
        for(i = 0; i<n ; i++)
{
```

```
System.out.println(" Marks in subject " + (i+1) + " : ");
marks[i] = in.nextInt();
}
}
void calculate_sgpa()
{
for(i = 0; i<n; i++)
{
if(marks[i] >= 90 && marks[i] <= 100)
    grade = 10;
else if(marks[i] >= 80 && marks[i] <= 90)
  grade = 9;
else if(marks[i] >= 70 && marks[i] <= 80)
  grade = 8;
else if(marks[i] >= 60 && marks[i] <= 70)
  grade = 7;
else if(marks[i] >= 50 && marks[i] <= 60)
  grade = 6;
else if(marks[i] >= 40 && marks[i] <= 50)
  grade = 5;
else if(marks[i] >= 30 && marks[i] <= 40)
  grade = 4;
else if(marks[i] >= 20 && marks[i] <= 30)
  grade = 3;
else if(marks[i] >= 10 && marks[i] <= 20)
  grade = 2;
else if(marks[i] >= 0 && marks[i]
else
System.out.println(" Invalid marks entered ");
  total = total + (grade * credits[i]);
}
```

```
total = total /20 ;
System.out.println ("Sgpa = " + total);
}
void student_information ()
{
System.out.println ("Name :" + name );
System.out.println (" USN: " + usn);
System.out.println("Marks & Credits of all subjects:" );
for ( i= 0; i<n; i++ )
{
System.out.println (" Subject :" + (i+1)+" :" );
" (" Marks :" + marks[i]);
" (" Credits :" + credits[i]);
}
calculate_sgpa();
}
public static void main(String args[] )
{
Student s= new Student ();
s.get_details();
s.calculate_sgpa();
s.student_information ();
}
}
```

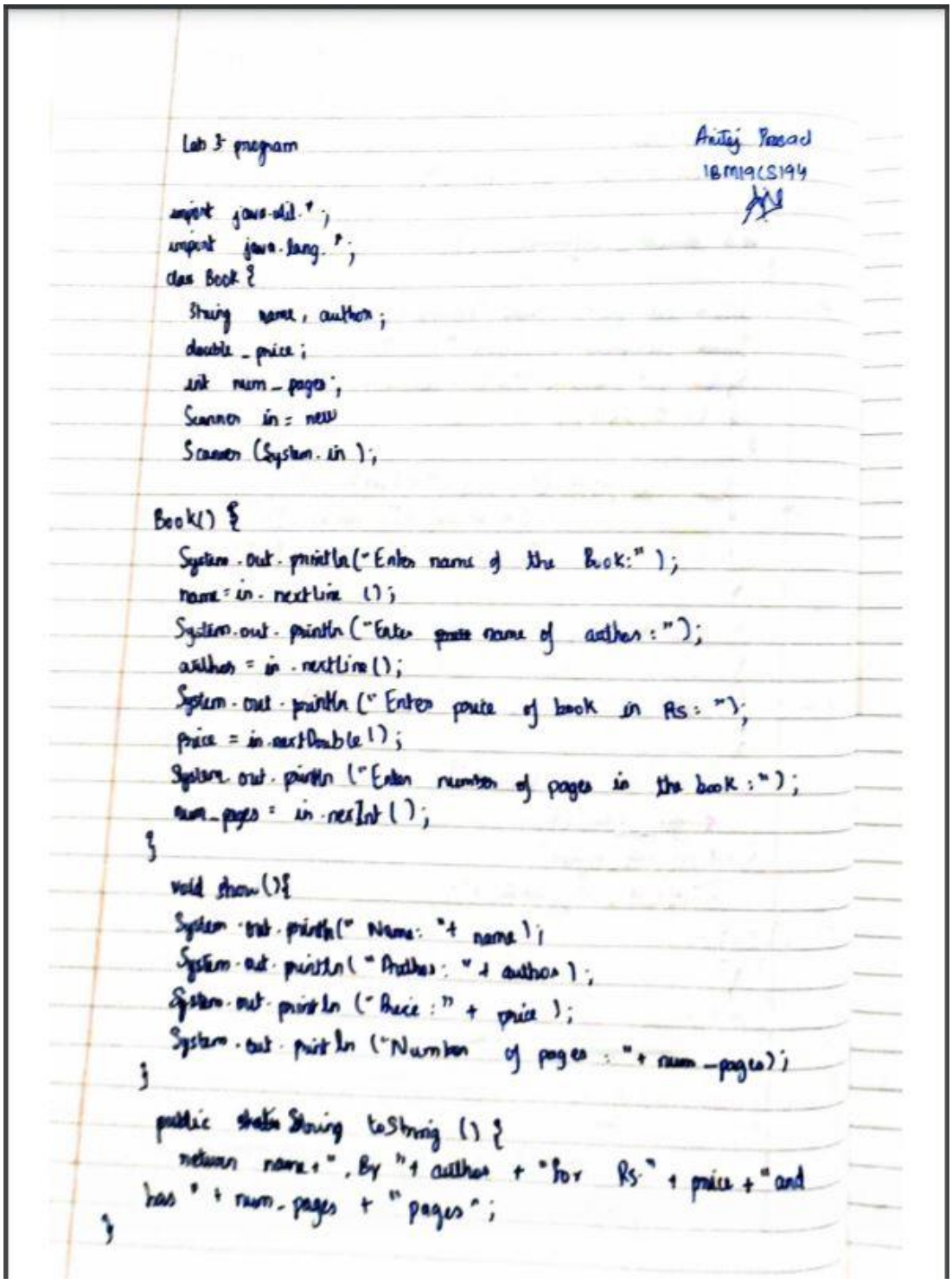

Enter Student Name:
ANITEJ
Enter the USN:
1BM19CS194
Enter the no. of subjects:
5
Enter Subject credits:
Credits for subject1:
3
Credits for subject2:
2
Credits for subject3:
4
Credits for subject4:
3
Credits for subject5:
2
Marks in subject1:
56
Marks in subject2:
65
Marks in subject3:
76
Marks in subject4:
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 3 program                                   Ankit Prasad
                                                1BM19CS194

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 the 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 static 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)) ;
  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 :");
```

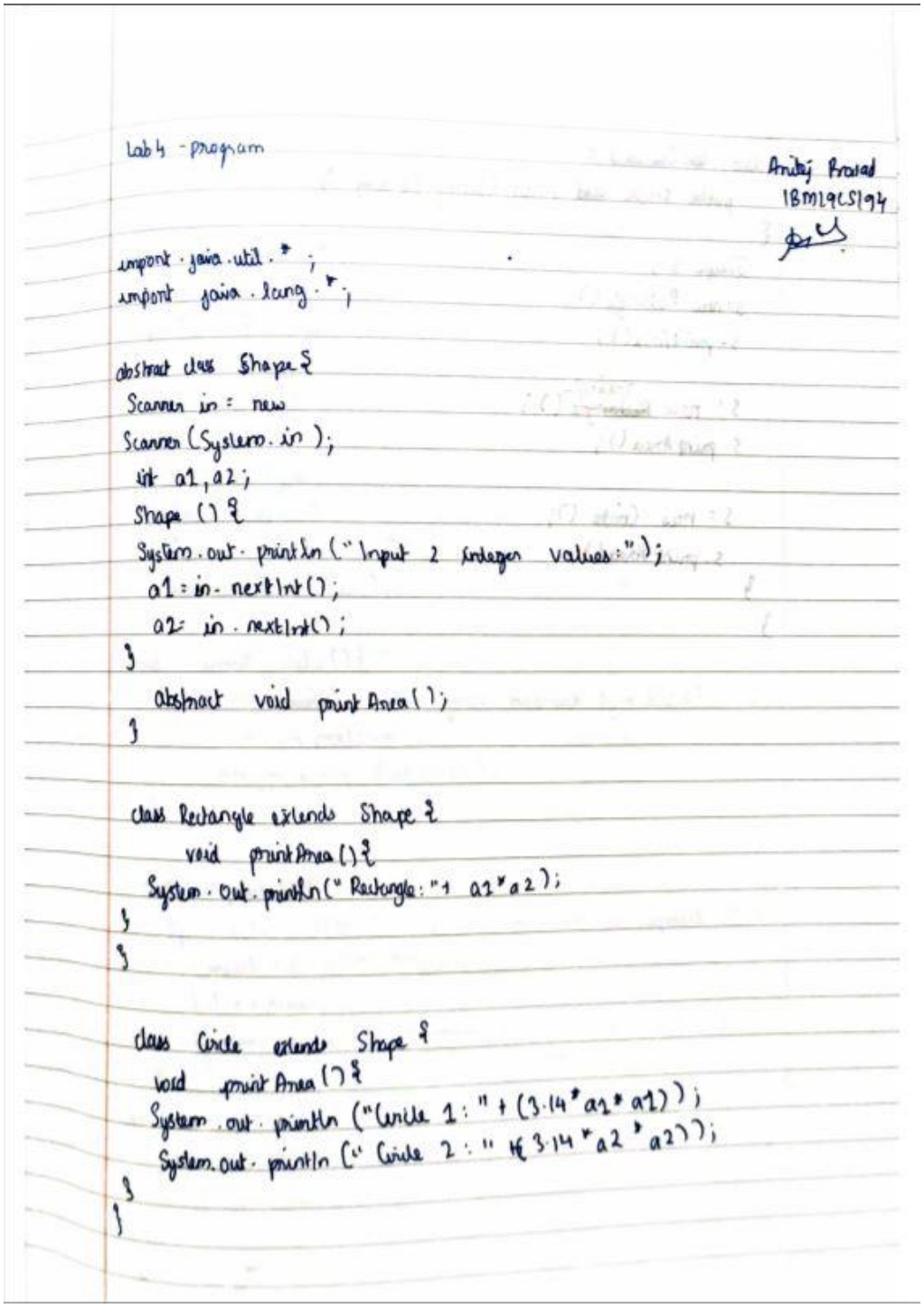
```
x = in.nextInt();
} while (x < 1 || x > n);
B[x-1].show();
}
}
```

```
Enter number of books:
2
book 1
Name of book:
the adventure
Name of author:
william
Price of book in Rs:
300
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.



Lab 4 - program

Ankaj Prasad
1BM19CS194

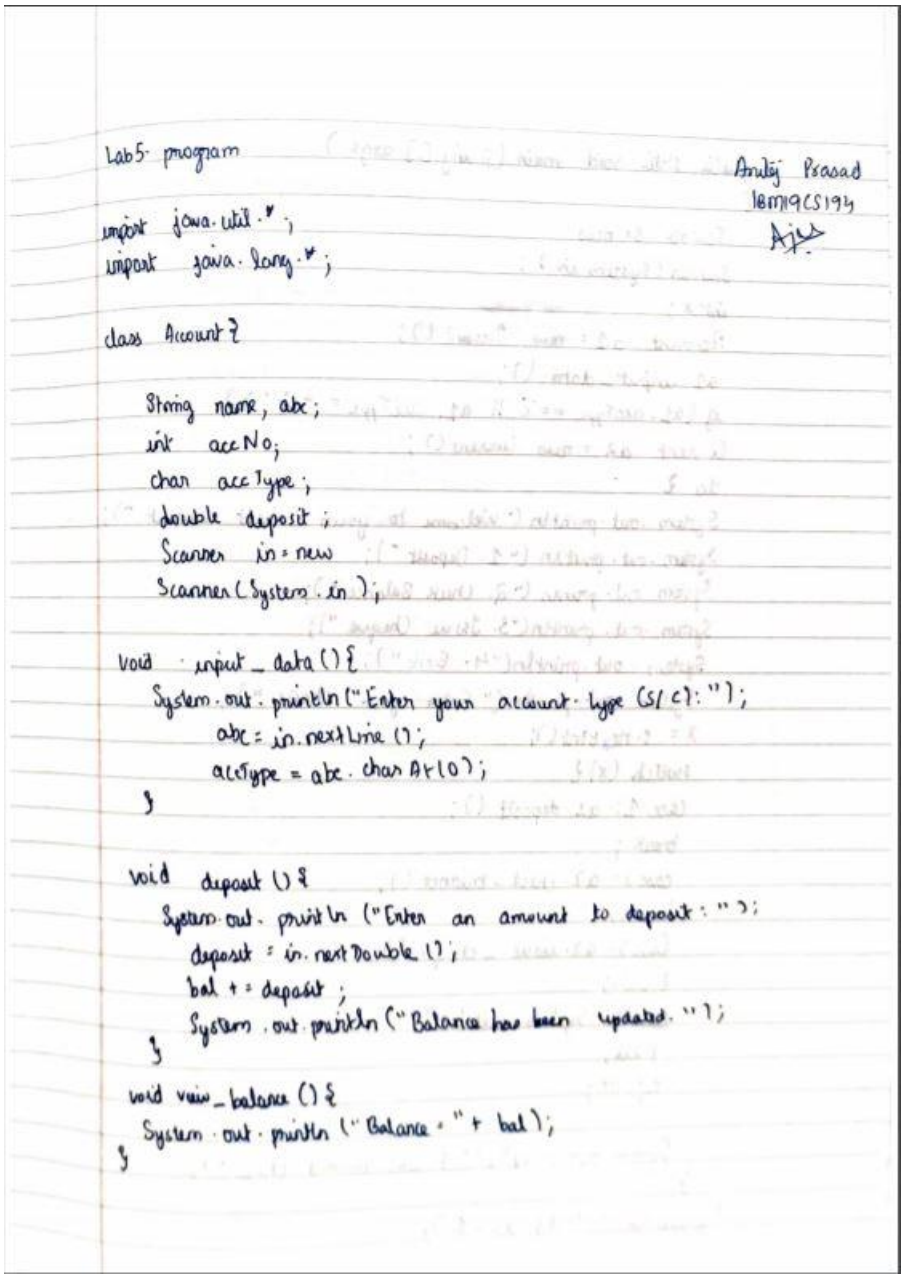
```
import java.util.*;
import java.lang.*;

abstract class Shape{
 Scanner in = new
 Scanner(System.in);
  int a1, a2;
  Shape (){
  System.out.println("Input 2 integer values:");
   a1 = in.nextInt();
   a2 = in.nextInt();
}
   abstract void printArea();
}

class Rectangle extends Shape{
     void printArea(){
  System.out.println("Rectangle:"+ a1*a2);
}
}

class Circle extends Shape{
  void printArea(){
  System.out.println("Circle 1:" + (3.14*a1*a1));
   System.out.println("Circle 2:" + (3.14*a2*a2));
}
}
```

```
class testAbstract {
    public static void main (String [] args )
{
  Shape s ;
  s = new Rectangle ();
  s. printArea ();

  s = new Triangle ();
  s. printArea ();

  s = new Circle ();
  s. printArea ();
 }
}
```

```
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


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

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.



```
Lab5- program                                   Anuj Prasad
                                                1BM19CS194
import java.util.*;
import java.lang.*;

class Account{

    String name, abc;
    int accNo;
    char accType;
    double deposit;
    Scanner in = new
    Scanner(System.in);

void input_data(){
    System.out.println("Enter your account type (S/C):");
        abc = in.nextLine();
        accType = abc.charAt(0);
    }

void deposit(){
    System.out.println("Enter an amount to deposit:");
        deposit = in.nextDouble();
        bal += deposit;
        System.out.println("Balance has been updated.");
    }
void view_balance(){
    System.out.println("Balance = " + bal);
}
```

```
public static void main (String [] args )
{
  Scanner S= new
  Scanner (System.in ) ;
  int x ;
  Account a1 = new Account ();
  a1 .input_data ();
  if (a1. accType == 'c' || a1. accType = = 'c' ) {
  Current 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 ");
   x = S. nextInt ();
   switch (x) {
   case 1: a2. deposit ();
    break ;
    case 2: a2. check_balance ();
    break;
    Case 3: a2. issue _cheque ();
    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();
    switch(x){
    case 1: a3.deposit();
    break;
    case 2: a3.check_balance();   (view)
    break;
    case 3: a3.withdraw_balance();   (withdraw balance)
    break;
    Case 4: System.exit(0); a3.compute_ci();
    break;
    default: System.out.println("Error. Invalid Choice");
    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 Account {
 Current () {
 System.out.println (" Enter your name: " );
  name = in. nextline ();
 System . out. println (" Enter your Account number : " );
     accNo = in. nextInt ();
     deposit ();
 }
  double chq_amount;
  void issue_cheque () {
  System . out. println (" Enter amount for which cheque is to be
 issued . ");
  ~~cheque~~ chq_amount = in. nextDouble ();
  if (chq_amount > bal ) {
  System . out. println (" Error ! Insufficient balance in account. ");
 }
 else {
  bal = chq_amount ;
 System . out. println(" Cheque has been issued successfully" );
 }
}
  void check_balance () {
  if (bal < 1000 ) {
  System . out . println (" Current available balance is lesser than
minimum required balance " );
  bal = 100;
  System . out . println (" Service charge of Rs. 100 has been deducted
from your ~~phone~~ balance" );
 }
  view_balance ();
}
}
```

```
class Savings extends Account {
  double CI, withdrawal_amount, time;
Savings(){
 System.out.println("Enter your name: ");
 name = in.nextLine();
 System.out.println("Enter your account number.");
  accNo = in.nextInt();
   deposit();
}
void compute_CI(){
  System.out.println("Enter time period:");
 time = in.nextInt();
  CI = bal * Math.pow(1 + (0.08/12), 12*time) - bal;
  System.out.println("CI = " + CI);
   bal += CI;
   System.out.println("CI has been deposited");
}
void withdraw_balance(){
System.out.println("Enter the amount you want to withdraw:");
withdrawal_amount = in.nextDouble();
if(withdrawal_amount > bal){
System.out.println("Error! The entered amount is greater than
the available balance");
  }
 else {
 bal = withdrawal_amount;
 System.out.println("Amount has been successfully withdrawn");
}
}
}
```

```
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
1. Deposit
2. View Balance
3. Withdraw
4. Calculate compound interest
5. Exit
Enter your choice:
1
Enter an amount to deposit:
200
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:
exit
```

```
Enter your account type (Savings/Current):
current
Enter your name:
anitej
Enter your account number:
12345
Enter an amount to deposit:
300
Balance has been updated.
WELCOME TO YOUR CURRENT ACCOUNT
1. Deposit
2. Check Balance
3. Issue Cheque
4. Exit
Enter your choice:
3
Enter amount for which cheque is to be issued.
240
Cheque has been issued SUCCESSFULLY
WELCOME TO YOUR CURRENT ACCOUNT
1. Deposit
2. Check Balance
3. Issue Cheque
4. Exit
Enter your choice:
```