Date .....

Expt. No. .....

Page No. .....

LAB (week 3).

1) Quadratic eqn program.

```
public class Main {
    public static void main(String args[]){
        double r1, r2;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a,b,c value: \t");
        double a = sc.nextDouble();
        double b = sc.nextDouble();
        double c = sc.nextDouble();
        double d = b*b - 4*a*c;
        if (D<0 {
            System.out.println("Imaginary root: " + (-b/2*a) + "+" + (Math.sqrt(-D)/2*a) + "i");
```

Teacher's Signature : _____

LAB 1 ^^^^^^^^^^^^^^^

Scanned by CamScanner

Date .....

Expt. No. ..... Page No. .....

```
System.out.println("Imaginary root2: "+
        (-b/2*a)+"-("+Math.sqrt((-D)/2*a)+
        "i");

} else {

r1 = (-b + Math.sqrt(D))/2*a;

r2 = (-b - Math.sqrt(D))/2*a;

System.out.println("real root 1: "+r1);

System.out.println("real root2: "+r2);

}

}

}
```

Teacher's Signature : _____

Scanned by CamScanner

BASIC ALGO / LOGIC

- Quadratic determinant : $b^2 - 4ac$

where a, b, c are variables.

$ax^2 + bx + c$

INPUT (a, b, c)

$b^2 - 4ac = D$

D<0 D>0

$\frac{-b \pm \sqrt{-D}}{2a}$ = (some form of fraction)

$-b + \sqrt{D}$ (direct value) $2a$ = some value

OUTPUT a b c

5
5
5
Imaginary root1 - 12.5 + 21.65
Imaginary root2 - 12.5 - 21.65

1
5
4
real root1 : -1.0
real root2 : -4.0

Scanned by CamScanner

```
public class Main{
    public static void main(String args[] ){
        double r1,r2;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter a,b,c value:\t");
        double a = sc.nextDouble();
        double b = sc.nextDouble();
        double c = sc.nextDouble();
        double D = b*b-4*a*c;
        if(D<0) {
            System.out.println("Imaginary root1: "+(-b/2*a)+"+ "+(Math.sqrt(-D)/2*a)+"i");
            System.out.println("Imaginary root2: "+(-b/2*a)+"- "+(Math.sqrt(-D)/2*a)+"i");
        }else {
            r1 = (-b+Math.sqrt(D))/2*a;
            r2 = (-b-Math.sqrt(D))/2*a;
            System.out.println("real root1: "+r1);
            System.out.println("real root2: "+r2);
        }

    }

}
```

input

```
Enter a,b,c value:
5
5
5
Imaginary root1: -12.5+ 21.650635094610971i
Imaginary root2: -12.5- 21.650635094610971i
```

Scanned by CamScanner

LAB PROGRAM 2→

Develop a java program to create a class student with members usn,name and credits and array marks use methods to display and accept details.

Expt. No. ..... Date .....

Page No. .....

② SGPA PROGRAM :-

```
import java.util.Scanner.
class Student
{ private String USN;
  private String name;
  private int n;
  private double SGPA = 0;
  private int totalcredits = 0;

Scanner ss = new Scanner(system.in);

void Details()
{ system.out.println("Enter USN of student");
  USN = ss.nextline();

  system.out.println("Enter name");
  name = ss.nextline();

  system.out.println("Enter no of subjects");
  n = ss.nextint();

  int credits[] = new int[n];
```

Teacher's Signature : _____

Expt. No. ..... || to show how many times u take data Date .....
Page No. .....

```
double marks [] = new double [n];
System.out.println("Enter details of sub");
for(int i=0; i<n; i++)
{ system.out.println("Enter credits allotted to sub"
    +(i+1));
  marks[i] = ss.nextInt();
  Calculate(credits[i], marks[i], i);
}}

void Calculate(int credits, double marks, int j)
{ totalCredits = totalcrits + credit;
  if (mark >= 90 && mark <= 100)
    SGPA = SGPA + (10 * credit);
  else if (mark >= 80 && mark <= 89)
    SGPA = SGPA + (9 * credit)
  else if (mark >= 70 && mark <= 79)
    SGPA = SGPA + (8 * credit)
```

Teacher's Signature : _____

Scanned by CamScanner

Date .....

Expt. No. .....

Page No. .....

```
else if (marks>=60 && mark<=69)
    SGPA = SGPA + (7 * credits)

else if (marks>=50 && mark<=59)
    SGPA = SGPA + (6 * credits)

else if (marks>=40 && mark<=49)
    SGPA = SGPA + (5 * credits)
else
System.out.println("Failed subject"+(j+1));
}
void Display()
{ system.out.println("Name: "+name);
  system.out.println("USN: "+USN);
  system.out.println("SGPA of student"+
      (SGPA/total credits));
```

Teacher's Signature : _____

Scanned by CamScanner

Date .....

Expt. No. ..... Page No. .....

```
class Main
{ public static void main (String args[])
  {
    Student s1 = new Student();
    s1.Details();   // similar to
    s1.Display();   calling function
  }                 obj
}
```

Teacher's Signature : _____

Scanned by CamScanner

Output

Enter USN of student
151

Enter name of student
Shivanshu P

Enter no of subj
3

Credits alloted to sub 1
5

Enter mark in sub 1
80

Credits alloted to sub 2
4

Enter marks in sub 2
75

Enter credits alloted to sub 3
4

Enter marks in sub 3
72

Details of student
Name: Shivanshu P
USN : 151
SGPA : 8.3846

Scanned by CamScanner

basic Algo logic for input

: name ——
USN ——
~~marks~~ subj — n

mark [1] - - - mark [<= n]
credits [1] - - - cred [<= n]

basic logic of program : marks [0+1]

↓

marks [<= n]

↓ using if-else cond

total ~~mark~~ SGPA

= (SGPA + 'x' * credit)

↓

SGPA = total SGPA / total credits

'x' => Grade Point

10 - S or else fail.

depending on if-else

Scanned by CamScanner

```
C:\Users\shivanshu\Desktop> java lab
Enter USN of the student
151
Enter Name of the student
shivanshu p
Enter no of subjects
6
Enter details of the subjects:
Enter credits allotted to the subject 1
5
Enter marks in the subject 1
80
Enter credits allotted to the subject 2
4
Enter marks in the subject 2
75
Enter credits allotted to the subject 3
4
Enter marks in the subject 3
72
Enter credits allotted to the subject 4
3
Enter marks in the subject 4
71
Enter credits allotted to the subject 5
1
Enter marks in the subject 5
90
Enter credits allotted to the subject 6
4
Enter marks in the subject 6
80
Details of the Student
Name :shivanshu p
USN: 151
SGPA of student 8.523809523809524

C:\Users\shivanshu\Desktop>
```

Scanned by CamScanner
Scanned by CamScanner

LAB3→create a class book which has 4 members book name, author, price and no of pages.Set a constructor to set values for members . Use an to string() to display the details.

```
import java.util.Scanner;
Class Main {
public static void main(String args[]) {
Scanner sc = new Scanner(System.in);
int n = sc.nextInt();
Book B[] = new Book[n];
for(i=0 ; i<n ; i++) {
{ System.println(.B[i]);
System.print("\n"); }

}
}
```

Scanned by CamScanner

Scanned by CamScanner

// Algo → creat a class Book with constructor function to string() which shld return string
class BookMain Eg call the Book class
code :→ // world.

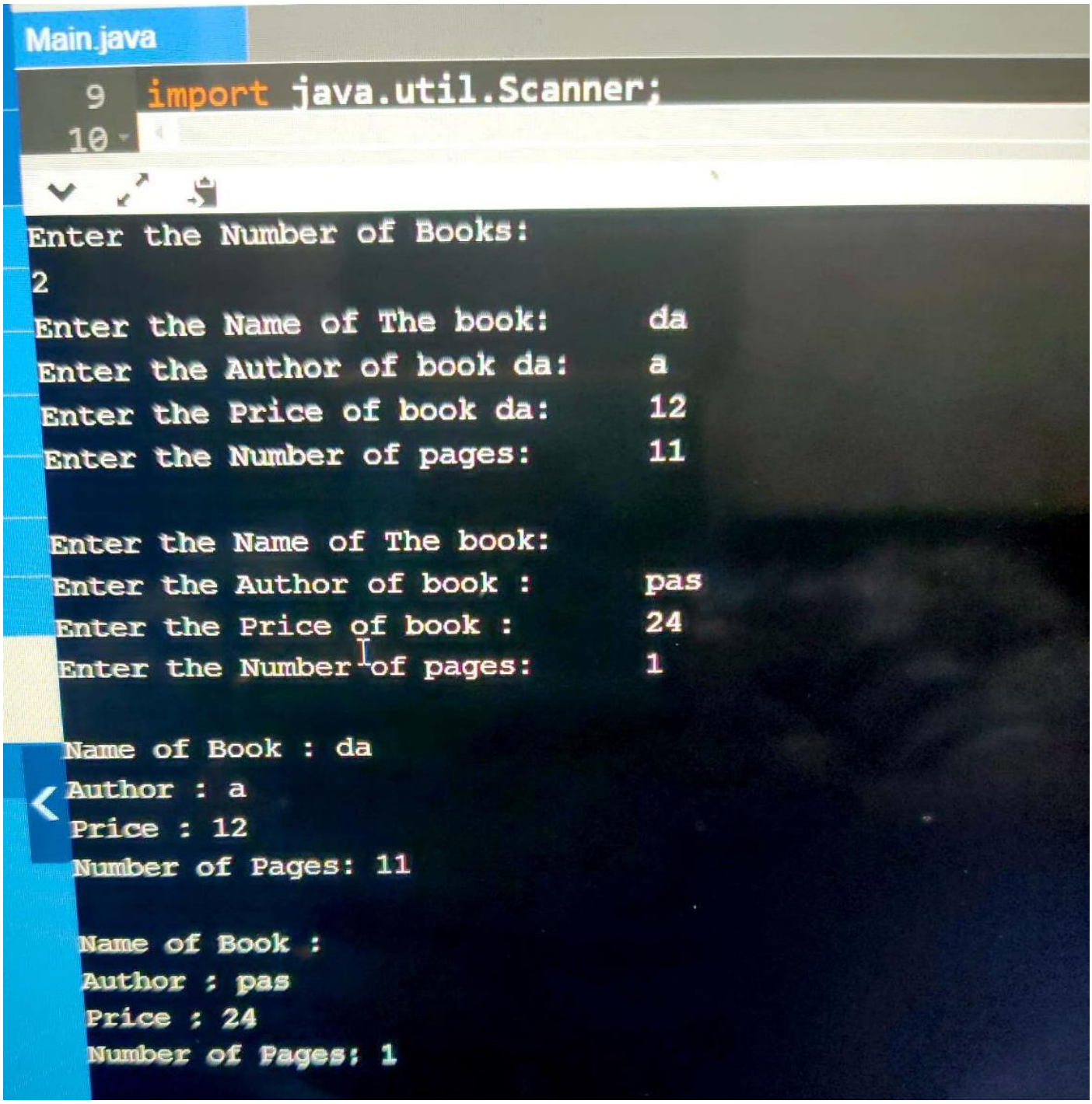
→

```
class Book {
String name, author; int price, npages;
Book()
{ Scanner sc = new Scanner(system.in);
System.out.println("Enter the name of book");
name = sc.nextLine();
System.out.println("Enter the author of book");
author = sc.nextLine();
System.out.println("Enter price of book");
price = sc.nextInt();
System.out.println("Enter no of pages");
npages = sc.nextInt();
}
```

Scanned by CamScanner
Scanned by CamScanner

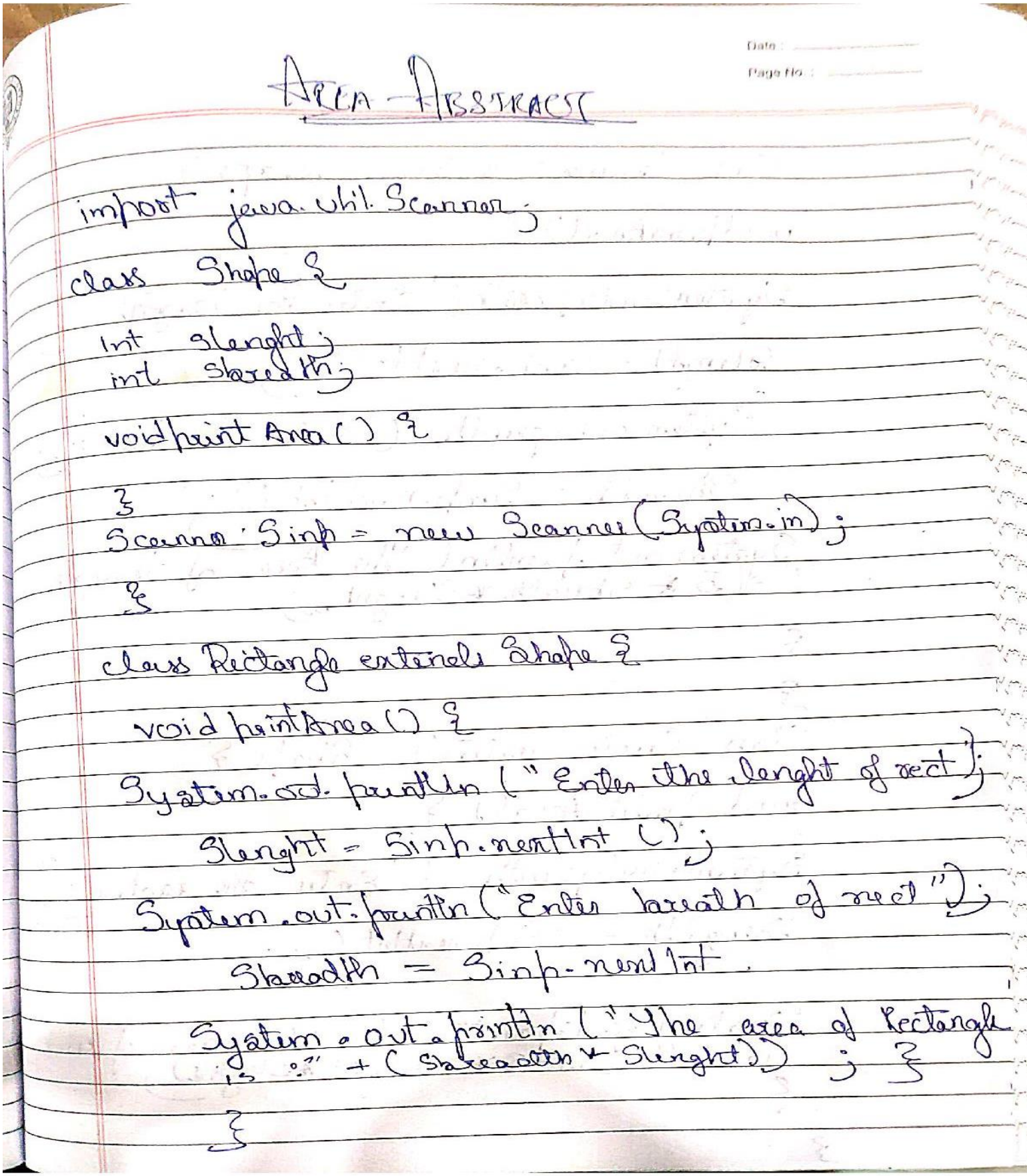
```
public String toString()
{
return ("Name of book :" + this.name +
"\n Author :" + author + "\n Price :" this.pric
+ "\n Pgno :" + this.pgno + );
}
}
```

Scanned by CamScanner



Scanned by CamScanner

LAB4 DOWN→Program to create a abstract class shape with 2 intergers and method printArea() and Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classescontain only the method printArea( ) that prints the area of the given shape.



AREA ABSTRACT

```
import java.util.Scanner;
class Shape {
int slenght;
int sbreadth;
void printArea() {
}
Scanner Sinp = new Scanner(System.in);
{
class Rectangle extends Shape {
void printArea() {
System.out.println("Enter the lenght of rect");
    slenght = Sinp.nextInt();
System.out.println("Enter breath of rect");
    sbreadth = Sinp.nextInt.
System.out.println("The area of Rectangle
is :" + (sbreadth * slenght)); }
}
```

Scanned by CamScanner

```
class Triangle extends Shape {
void printArea() {
System.out.println("Enter the height:");
Slenght = Sinp.nextInt();
System.out.println("Enter the base:");
Sbreadth = Sinp.nextInt();
System.out.println("The Area of triangle is:
" +(5 * Sbreath * Slenght));
}
}
Class Circle extends Shape {
void printArea() {
System.out.println("Enter the radius:");
Slenghth = Sinp.nextInt();
System.out.println("The area of circle
is:" +(3.143 * Slenght * Slenght);
}
}
```

Scanned by CamScanner

Date :
Page No. :

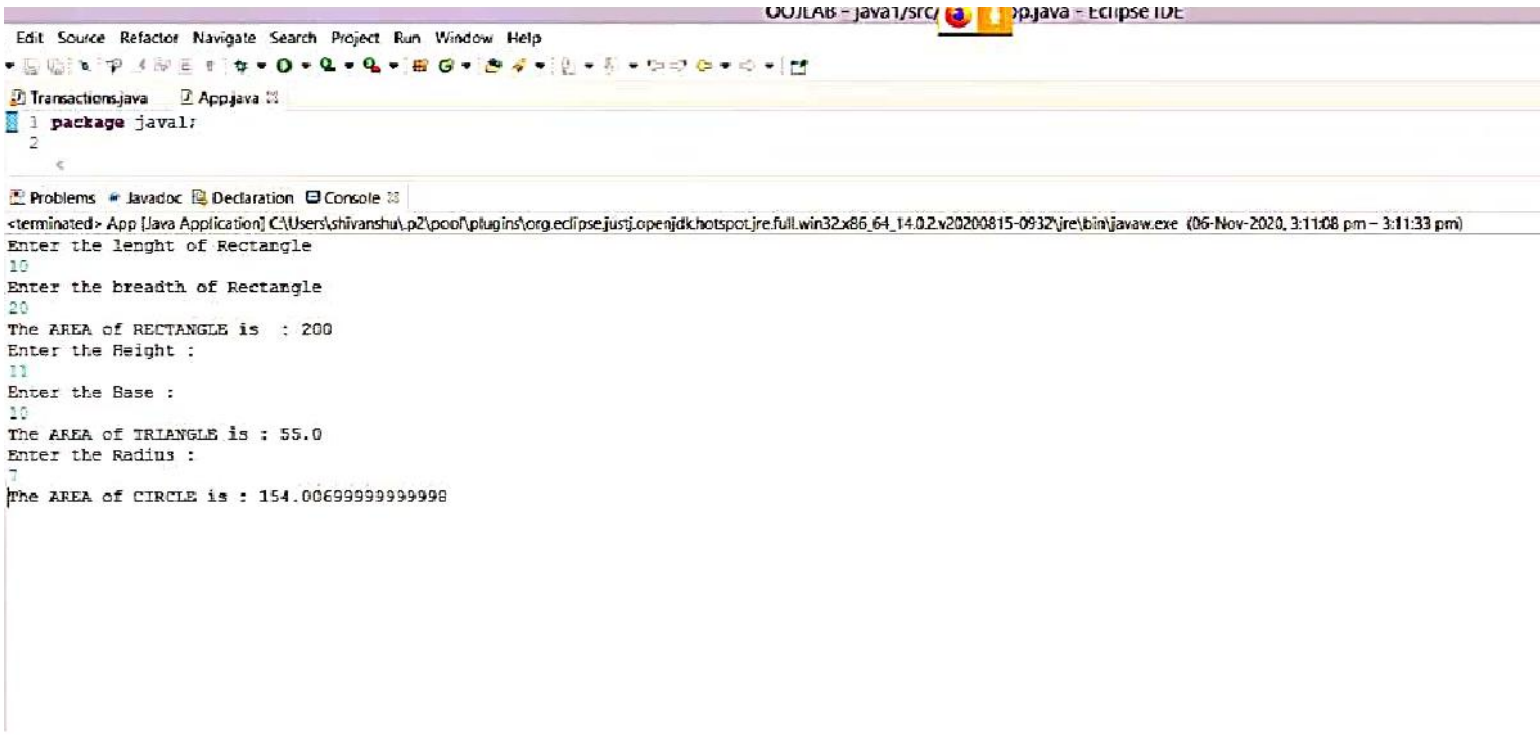
```
public class Aplp {
public static void main (String[] args)
throws Exception {
Rectangle R1 = new Rectangle ();
Triangle T1 = new Triangle ();
Circle C1 = new Circle ();

R1.printArea ();
T1.printArea ();
C1.printArea ();

}

}
```

Scanned by CamScanner



LAB 5 DOWN-→

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. -->

Scanned by CamScanner

Date :

Page No. :

BANK

```
import java.util.Scanner;
class Bank
{
int depositbal;
int withdrawbal;
String customername;
String accountno;
String accounthype;
int balance = 2780;

void accept()
{ Scanner s = new Scanner(System.in);
System.out.println("Enter customer name\n");
customername = s.next();
System.out.println("Enter Acc number\n");
accountno = s.next();
System.out.println("Enter acc type\n");
accounthype = s.next();
}
```

Scanned by CamScanner

```
void display()
{ System.out.println("CUSTOMER NANE :"+Custom
- name\n");
System.out.println("CUSTOMER ACC NO8"+Accnt
System.out.println("CUSTOMER ACC TYPE8"+acctyp
System.out.println("BALANCE 8\n"+Balance);
}

} // end of class i

class curracct extends Bank {

int updatedbalance;
int Afterwithdraw;
int updatedlastbalance;

int cdepo_ba() {

updatedbalance = Balance + depositbalance;
return updatedbalance;
}
```

Scanned by CamScanner

Date :
Page No. :

```
int cwithba() {
Afterwithdrawn = ((updated balance) - withdrawn
                  balance));

}
int minimum()
{ if((Afterc withdrawn) <= (2000)))
{ updatedlostbalancec = ((Afterwithdrawn) - (200));
System.out.println("You have minimum bal
below 2000 so u have lost 200Rs");
return updatedlostbalancec; }
else
return Afterwithdrawc;
}
class savacc extends Bank {
int    updated balance;
int    Afterwithdraws;
int    updated lostbalances;
int    sdepo-ba() {
```

Scanned by CamScanner

```
updated balance = Balance + depositbalance
return updatedbalance;
}

int interest()
{  double r = 0.08;
   int n = 12;
   int t = 5
   compound interst = (int)
((updated balance) * (Math.pow((1+r/n)
   *(n*t))));

return compound interest;
}

int withba() {
Afterwithdraws = ((compoundinterest) - (withdra
- balance));
return Afterwithdraws; }
int minimum()
{ if ((Afterwithdraws) <= (1000))
```

Scanned by CamScanner

Date :

Page No. :

{ updatedlostbalance.s = ((Afterwithdraws) -(100));

return updated.lostbalances;

}

else

return Afterwithdraws; } }.

Class Transactions {

public static void main (String args()) {

Scanner r = new Scanner (System.in);

currAct CA = new currAct();

CA.acceptd();

System.out.println("Enter the money u want to deposit in current acc");

CA.depositbalance = r.nextInt();

System.out.println("After your deposition of "+CA.depositbalance+"\n New Balance is: "+CA.cdepoba());

System.out.println("Enter the money you want to withdraw

CA.withdrawsbalance = r.nextInt();

Scanned by CamScanner

System.out.println("After your withdrawal of"+
CA.withdrawbalance+"\n Now your total balance
is Rs-" +CA.cwithba());

System.out.println("After checking if you hav
minimum balance is RS" +CA.minimum());

SavAcc SA = new SavAcc();
SA.accept();

System.out.println("Enter money u want to
deposit in Saving ac");

SA.depositbalance = s.nextInt();

SA.display();

System.out.println("After your deposition of"+SA.
"\n Now your total bal is Rs" +SA.sdepoba()

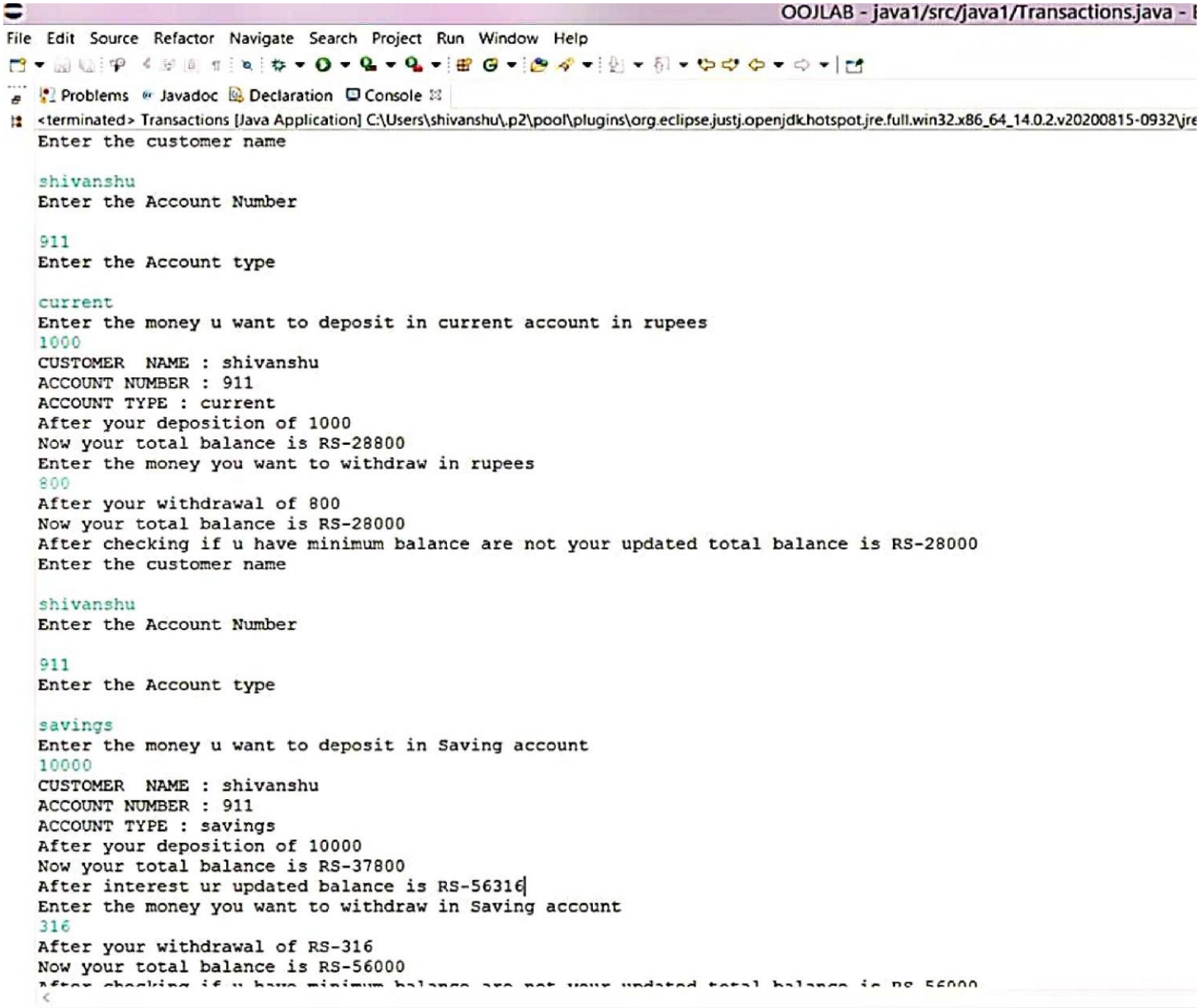
System.out.println("After interest your total"
+SA.interest());

System.out.println("After checking if u have
minimum balance you are not updated
total balance hence is Rs-" +SA.minimum());

}

}

Scanned by CamScanner



ACCOUNT TYPE : savings
After your deposition of 10000
Now your total balance is RS-37800
After interest ur updated balance is RS-56316
Enter the money you want to withdraw in Saving account
316
After your withdrawal of RS-316
Now your total balance is RS-56000
After checking if u have minimum balance are not your updated total balance is RS-56000

Scanned by CamScanner

Scanned by CamScanner

Scanned by CamScanner