RECORD

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.

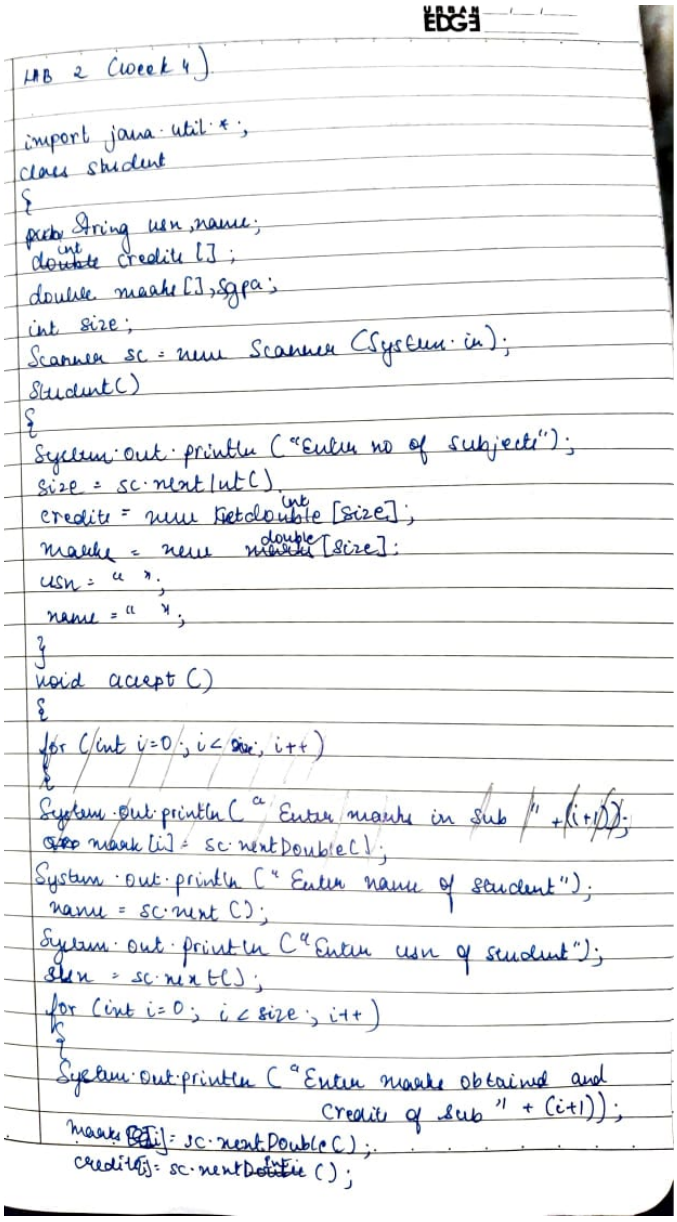
```
import java.util.*;
class quad
{
public static void main (String args[])
{
double a1, b1, c1, ans1, ans2;
Scanner sc= new Scanner (System.in)
System.out.println ("Enter values of a, b, c for quad
                    eqn in the form of ax²+bx+c.
                    where 'a' should be non 0");
```

```
a1 = sc.nextDouble();
b1 = sc.nextDouble();
c1 = sc.nextDouble();
if (a1==0)
System.out.println ("'a' should be non 0");
else
{
a2=(b*b)-(4*a*c);
if (a2>0)
{
System.out.println ("roots are real & unequal");
ans1 = (-b + Math.sqrt(a2)) / (2*a1);
ans2 = (-b - Math.sqrt(a2)) / (2*a1);
System.out.println ("the solutions of quad eqn are"
                    + ans1 + "and" + ans2);
}
else if (a2==0)
{
System.out.println ("roots are real & unequal");
ans1 = (-b + Math.sqrt(a2)) / (2*a1);
ans2 = (-b - Math.sqrt(a2)) / (2*a1);
System.out.println ("Solns of quad eqn are" + ans1
                    + "and" + ans2);
}
else
System.out.println ("no real roots");
}
}
}
```

```
[Arvinds-MacBook-Pro:ooj Arvind$ java quad
Enter the values of a,b,c for quad eqn in the form of ax^2+bx+c
where 'a' should be non zero
1
-3
-10
roots are real and unequal
The solutions of quad eqns are 5,0000 and -2,0000
[Arvinds-MacBook-Pro:ooj Arvind$ java quad
Enter the values of a,b,c for quad eqn in the form of ax^2+bx+c
where 'a' should be non zero
5
4
1
There are no real roots
[Arvinds-MacBook-Pro:ooj Arvind$ java quad
Enter the values of a,b,c for quad eqn in the form of ax^2+bx+c
where 'a' should be non zero
4
-4
1
roots are real and equal
The solutions of quad eqns are 0,5000 and 0,5000
Arvinds-MacBook-Pro:ooj Arvind$
```

LAB 2:

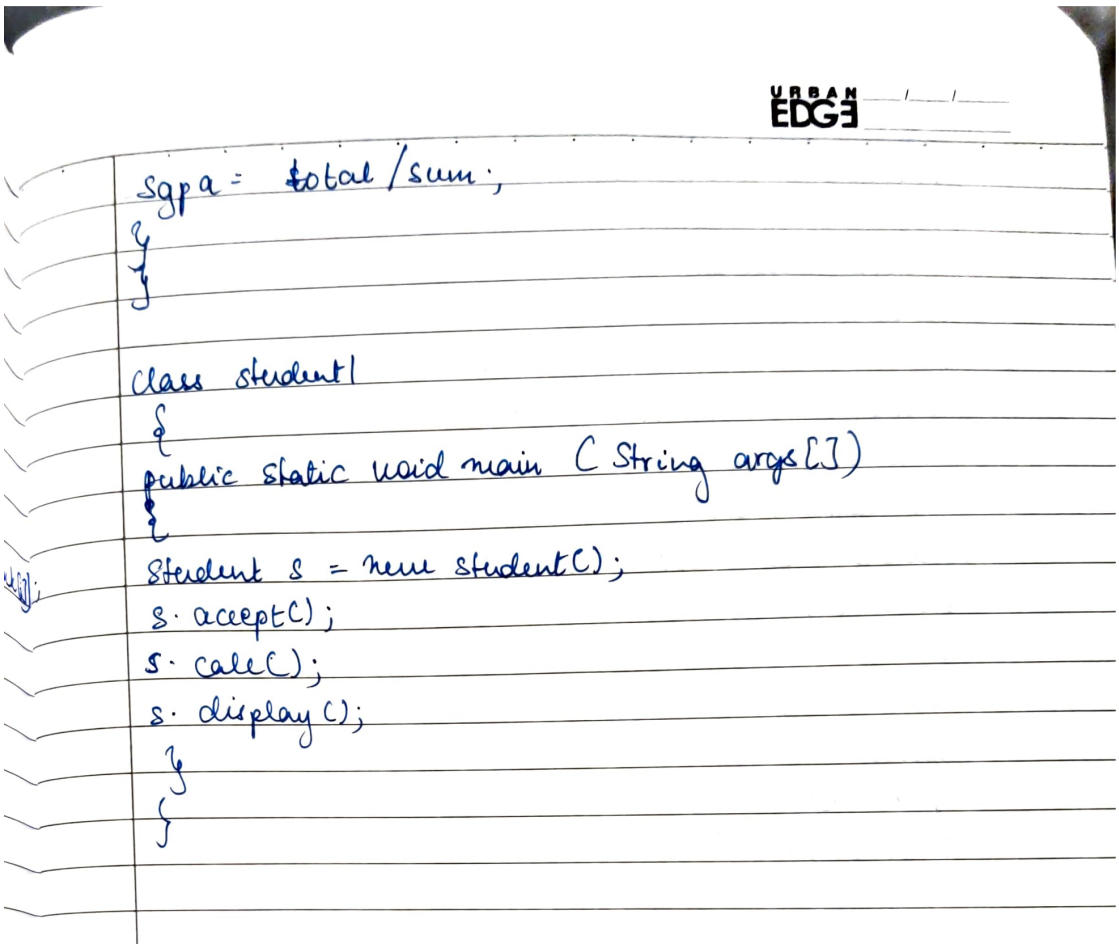
Develop a Java program to create a class Student with members usn, name, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student.



```
LAB 2 (Week 4)

import java.util.*;
class student
{
String usn,name;
int credit[];
double marks[],sgpa;
int size;
Scanner sc = new Scanner(System.in);
Student()
{
System.out.println("Enter no of subjects");
size = sc.nextInt();
credits = new int[size];
marks = new double[size];
usn = " ";
name = " ";
}
void accept()
{
for(int i=0; i<size; i++)
{
System.out.println("Enter marks in sub "+(i+1));
marks[i] = sc.nextDouble();
System.out.println("Enter name of student");
name = sc.next();
System.out.println("Enter usn of student");
usn = sc.next();
for(int i=0; i<size; i++)
{
System.out.println("Enter marks obtained and
                    Credits of sub " + (i+1));
marks[i] = sc.nextDouble();
credits[i] = sc.nextInt();
```

```
}
}
void display()
{
System.out.println("Name: " + name);
System.out.println("usn: " + usn);
System.out.println("Marks obtained");
for(int i=0; i<size; i++)
System.out.println("sub " + (i+1) + ": " + marks[i]);
System.out.println("sgpa: " + sgpa);
}
void calc()
{
for(int i=0; i<size; i++)
{
double sum=0, total=0;
for(int i=0; i<size; i++)
{
sum = sum + credits[i];
total = total + (marks[i] * credits[i]);
if(marks >=90 && marks <100)
total = total + (10 * credits[i]);
else if(marks >=80 && marks <90)
total = total + (9 * credits[i]);
else if(marks >=70 && marks <80)
total = total + (8 * credits[i]);
else if(marks >=60 && marks <70)
total = total + (7 * credits[i]);
else if(marks >=50 && marks <60)
total = total + (6 * credits[i]);
else if(marks >=40 && marks <50)
total = total + (5 * credits[i]);
else
total = total + (4 * credits[i]);
}
```



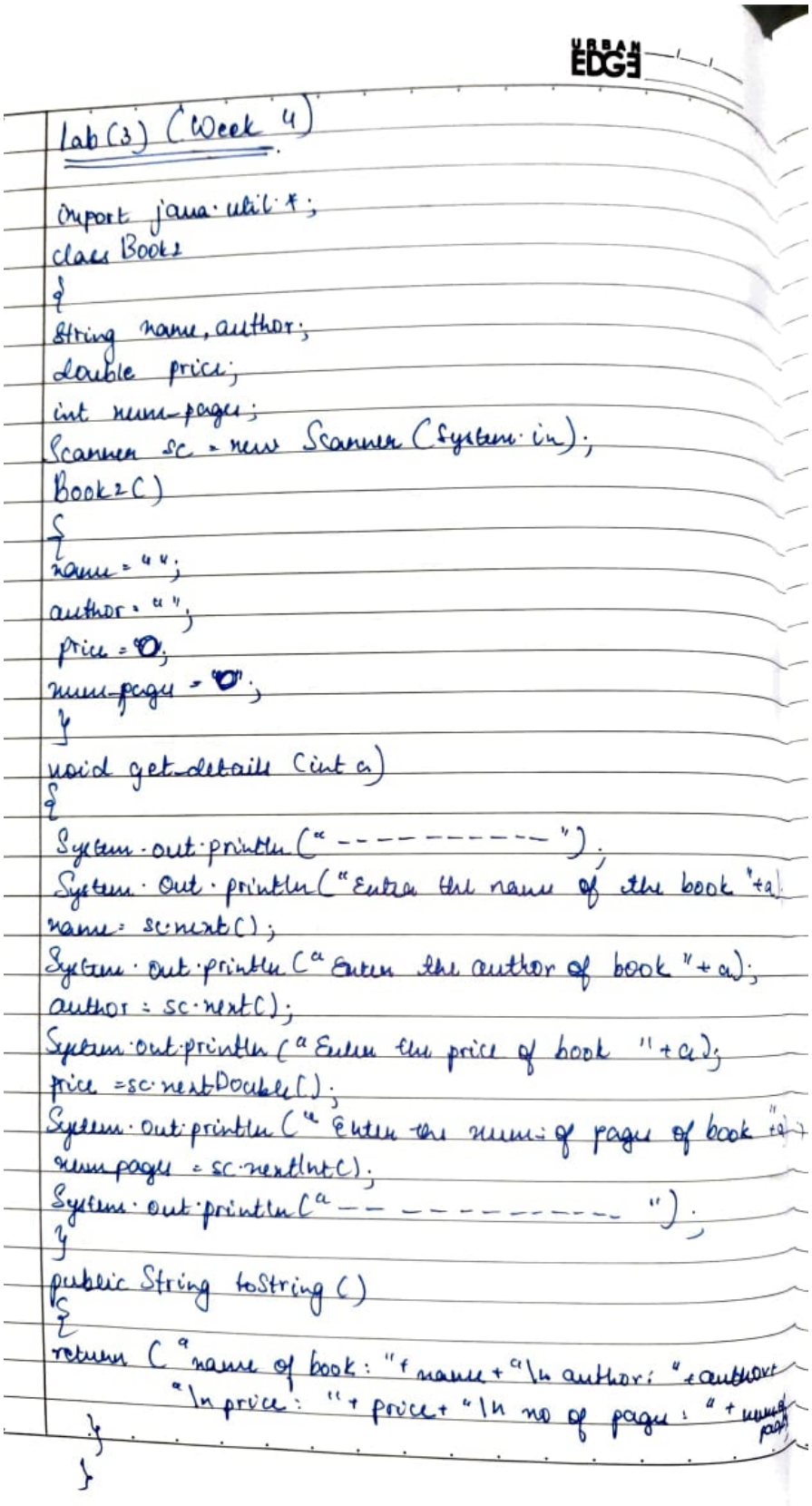
```
sgpa = total/sum;
}
}

class student1
{
public static void main (String args[])
{
Student s = new student();
s.accept();
s.calc();
s.display();
}
}
```

```
[Arvinds-MacBook-Pro:ooj Arvind$ javac Student.java
[Arvinds-MacBook-Pro:ooj Arvind$ java student1
Enter number of subjects
4
Enter the name of the student
aaa
enter usn of students
1bm19cs021
enter marks obtained and credits sub1
90
4
enter marks obtained and credits sub2
95
4
enter marks obtained and credits sub3
97
4
enter marks obtained and credits sub4
99
6
name:aaa
usn:1bm19cs021
------marks obtained-----
sub 1: marks=90.0 ; credits=4; grade_points=40.0;
sub 2: marks=95.0 ; credits=4; grade_points=40.0;
sub 3: marks=97.0 ; credits=4; grade_points=40.0;
sub 4: marks=99.0 ; credits=6; grade_points=60.0;
sgpa:10,00
Arvinds-MacBook-Pro:ooj Arvind$
```

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) (Week 4)

import java.util.*;
class Book2
{
String name, author;
double price;
int num_pages;
Scanner sc = new Scanner (System.in);
Book2()
{
name = " ";
author = " ";
price = 0;
num_page = 0;
}
void get_details (int a)
{
System.out.println(" ---------- ");
System.out.println("Enter the name of the book "+a);
name = sc.next();
System.out.println("Enter the author of book "+a);
author = sc.next();
System.out.println("Enter the price of book "+a);
price = sc.nextDouble();
System.out.println("Enter the num of pages of book "+a);
num_page = sc.nextInt();
System.out.println(" ---------- ");
}
public String toString()
{
return ("name of book: "+name+"\n author: "+author
"\n price: "+price+"\n no of page: "+num_page);
}
}
```

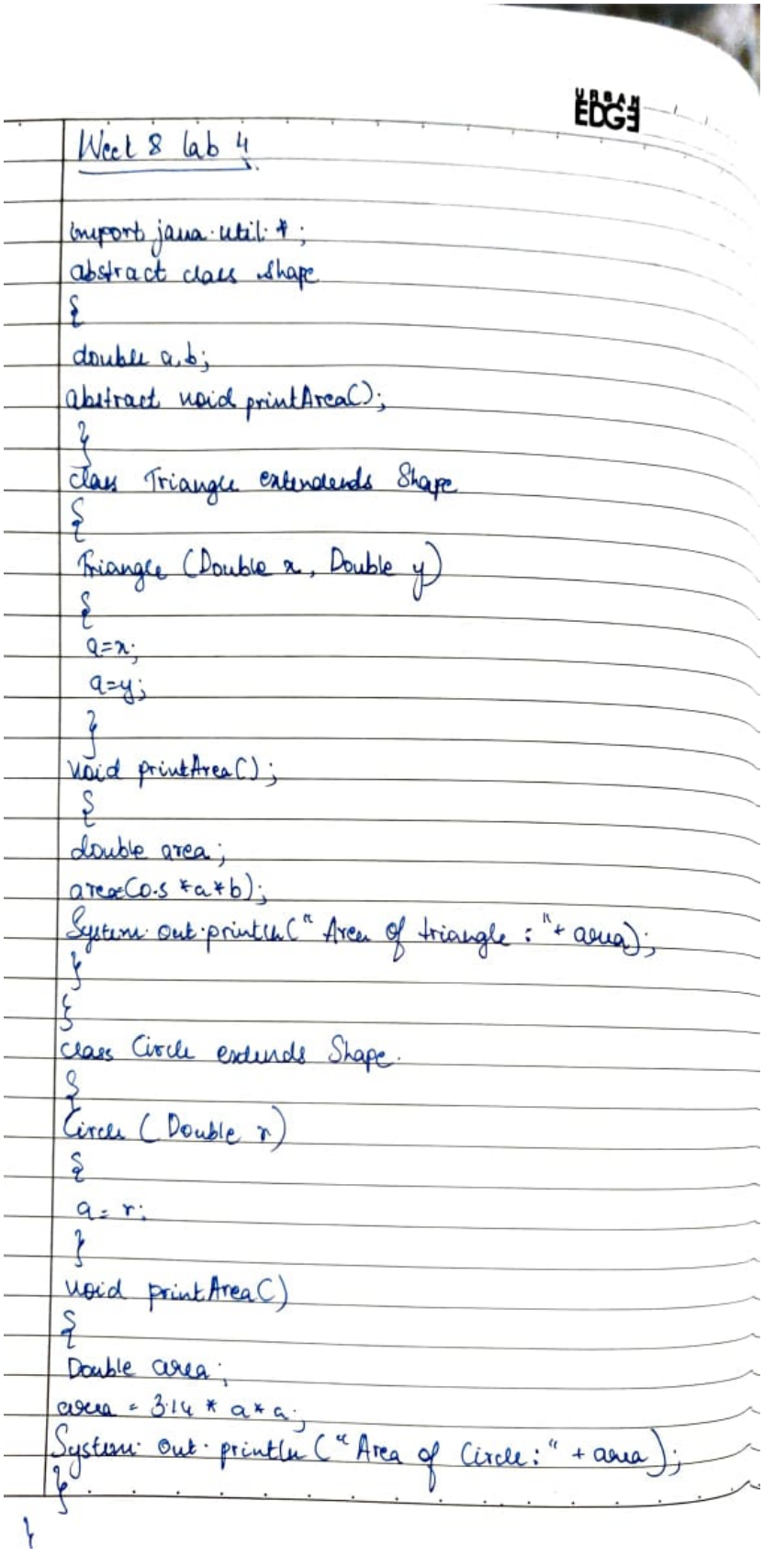
URBAN EDGE

```
Class Book2main
{
public static void main (String args[])
{
int n;
Book2 o[];
Scanner sc = new Scanner (System.in);
System.out.println ("Enter the no of book details to
                     be entered");
n = sc.nextInt();
o = new Book2[n];
for(int i=0 ; i<n ; i++)
{
o[i] = new Book2();
o[i] . get_details (i+1);
}
for (int i=0; i<n; i++)
{
System.out.println ("details of book "+ (i+1));
System.out.println (" - --  - - - - - - - - ");
System.out.println (o[i]);
}
}
}
```

```
Arvinds-MacBook-Pro:ooj Arvind$ java
enter the no of book details to be en
3
--------------------------------
enter the name of the book 1
revolution2020
enter the author of book 1
chethan
enter the price of book 1
300
enter the num_pages of book 1
300
--------------------------------
--------------------------------
enter the name of the book 2
kiterunner
enter the author of book 2
khaled
enter the price of book 2
400
enter the num_pages of book 2
300
--------------------------------
--------------------------------
enter the name of the book 3
divergent
enter the author of book 3
veronica
enter the price of book 3
150
enter the num_pages of book 3
100
--------------------------------
details of book 1
--------------------------------
name of book: revolution2020
author: chethan
price: 300.0
no of pages: 300
--------------------------------
details of book 2
--------------------------------
name of book: kiterunner
author: khaled
price: 400.0
no of pages: 300
--------------------------------
details of book 3
--------------------------------
name of book: divergent
author: veronica
price: 150.0
no of pages: 100
--------------------------------
Arvinds-MacBook-Pro:ooj Arvind$
```

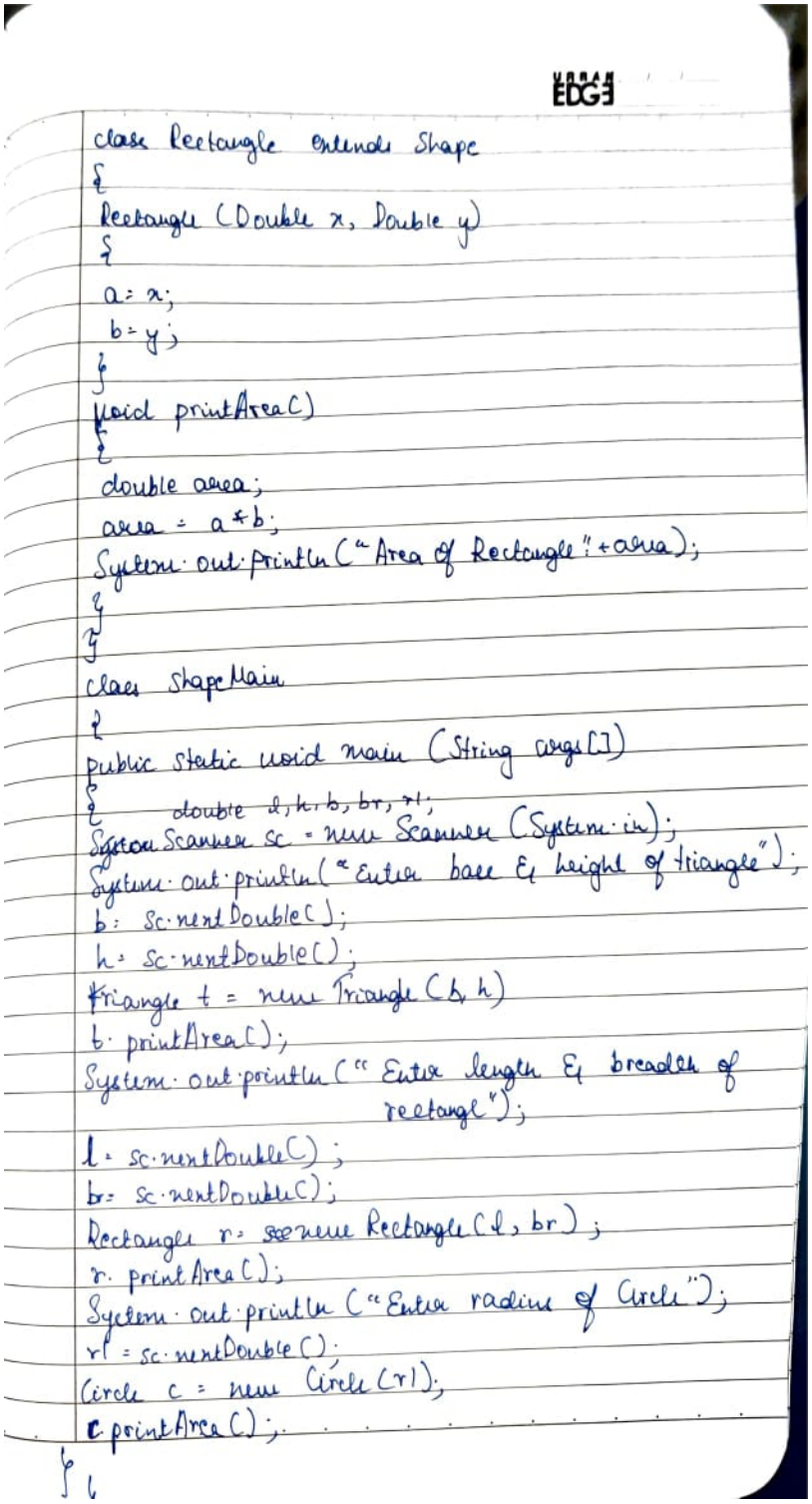
LAB 4

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.



```
Week 8 lab 4.

import java.util.*;
abstract class shape
{
double a,b;
abstract void printArea();
}
class Triangle extenxtends Shape
{
Triangle (Double x, Double y)
{
a=x;
a=y;
}
void printArea();
{
double area;
area=0.5 *a*b);
System.out.println(" Area of triangle :"+ area);
}
{
class Circle extends Shape.
{
Circle ( Double r)
{
a = r;
}
void printArea()
{
Double area;
area = 3.14 * a*a;
System.out.println("Area of Circle:" + area);
}
}
```

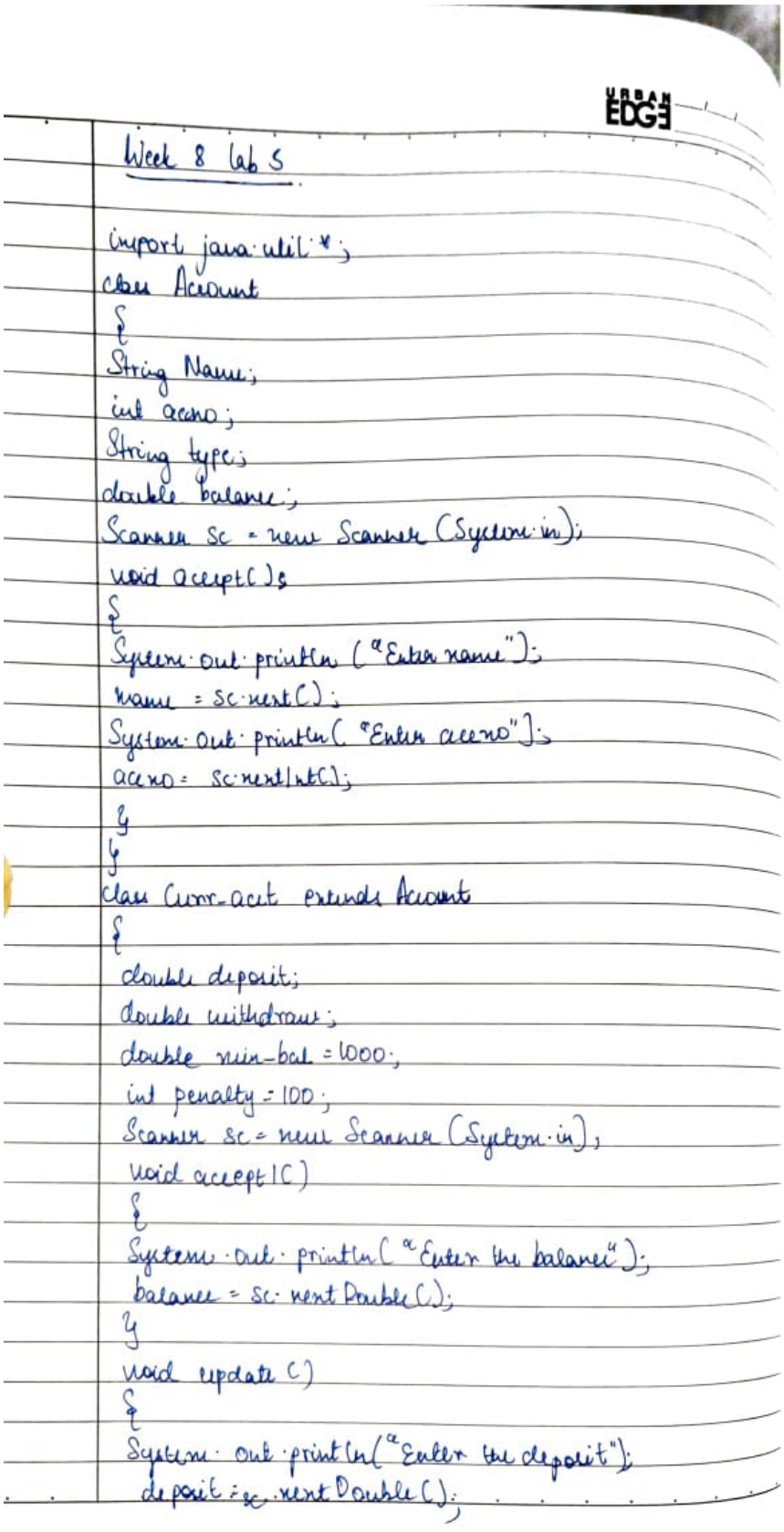


```
class Rectangle extends Shape
{
Rectangle (Double x, Double y)
{
a = x;
b = y;
}
void printArea()
{
double area;
area = a*b;
System.out.println("Area of Rectangle:"+area);
}
}
class ShapeMain
{
public static void main (String args[])
{
    double l,br,b,br,rl;
Scanner sc = new Scanner (System.in);
System.out.println("Enter base & height of triangle");
b = sc.nextDouble();
h = sc.nextDouble();
Triangle t = new Triangle (b,h)
b.printArea();
System.out.println("Enter length & breadth of
                    rectangle");
l = sc.nextDouble();
br = sc.nextDouble();
Rectangle r = new Rectangle (l, br);
r.printArea();
System.out.println("Enter radius of Circle");
rl = sc.nextDouble();
Circle c = new Circle (rl);
c.printArea();
}
}
```

```
Arvinds-MacBook-Pro:ooj Arvind$ java ShapeMain
enter the base and height of triangle
2
5
area of triangle:5.0
enter the lenght and breadth of rectangle
3
6
area of Rectangle:18.0
enter the radius of circle
4
area of circle:50.24
Arvinds-MacBook-Pro:ooj Arvind$
```

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: • 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



Week 8 lab 5

```
import java.util.*;
class Account
{
String Name;
int accno;
String type;
double balance;
Scanner sc = new Scanner (System.in);
void accept()
{
System.out.println ("Enter name");
name = sc.next();
System.out.println( "Enter accno");
accno = sc.nextInt();
}
}
class Curr_acct extends Account
{
double deposit;
double withdraw;
double min_bal = 1000;
int penalty = 100;
Scanner sc = new Scanner (System.in);
void accept()
{
System.out.println( "Enter the balance");
balance = sc.nextDouble();
}
void update()
{
System.out.println("Enter the deposit");
deposit = sc.nextDouble();
```

```
balance += deposit;
System.out.println("balance got update to " + balance);
}
void check()
{
if (balance < min_bal)
{
System.out.println("a penalty of 100 is imposed");
balance -= penalty;
System.out.println("balance got update to: " + balance);
}
}
void withdrawal()
{
System.out.println("Enter amt to be withdrawn");
withdraw = sc.nextDouble();
balance -= withdraw;
System.out.println("balance got updated to:" + balance);
check();
}
void display()
{
System.out.println("------DETAILS-----");
System.out.println("name: "+name);
System.out.println("accno: " + accno);
System.out.println("type: " + type);
if (balance<100)
System.out.println("balance: "+ balance);
System.out.println("cheque book facility exists");
}
}
```

```
class savacct extends Account
{
double balance;
double deposit;
double withdraw;
double interest, time, rate;
Scanner sc = new Scanner (System.in);
void accept()
{
System.out.println ("Enter the balance");
balance = sc.nextDouble();
}
void update()
{
System.out.println ("Enter the deposit");
deposit = sc.nextDouble();
balance += deposit;
System.out.println ("Balance got update to: " + balance);
}
void calcinterest()
{
System.out.println("Enter amt to be withdrawn");
withdraw = sc.nextDouble();
balance -= withdraw;
System.out.println ("balance got update to: " + balance);
}
void display()
{
System.out.println ("------ DETAILS ------");
System.out.println ("Name: " + name);
System.out.println ("Acno: " + accno);
System.out.println ("type: " + type);
calcinterest();
```

```
if (balance < 0)
{
System.out.printf ("balance : %.3f", balance);
System.out.println ();
System.out.println ("Cheque book facility does not exist");
}
}

class Bank
{
public static void main (String args[])
{
int op, ch;
Scanner sc = new Scanner (System.in);
System.out.println ("1. Curr Acct \n2. Sav.acct");
System.out.println ("Enter your choice");
op = sc.nextInt();
switch (ch)
{
case 1:
a.update ();
break;
case 2:
if (op == 1)
{
Curr_acct a = new Curr.acct();
a.type = "Curr-acct";
a.accept();
a.acceptI();
do {
System.out.println ("1. deposit 2. withdrawal 3. exit");
System.out.println ("enter your choice");
ch = sc.nextInt();
switch (ch)
```

```
{
case 1:
a.update();
break;
case 2:
a.withdrawal();
break;
case 3:
a.display();
break;
default:
System.out.println("Wrong choice");
}
}while(ch!=3);
}
if(op==2)
{
Sav_acct b = new Savacct();
b.type = "sav_acct";
b.accept();
b.acceptI();
do{
System.out.println("1.deposit 2.withdrawal 3.exit");
System.out.println("Enter your choice");
ch = sc.nextInt();
switch(ch)
{
case 1:
b.update();
break;
case 2:
b.withdrawal();
break;
```

```
case 3:
b.display();
break;
default:
System.out.println("Wrong choice");
}
}while(ch!=3);
}
}
```

```
Arvinds-MacBook-Pro:ooj Arvind$ java Bank
1.curr_Acct
2.sav acct
enter the type
1
enter name
aaa
enter accno
1234
enter the balance
1000
1.deposit 2.withdrawal 3.exit
enter your choice
1
enter the deposit
100
balance got updated to:1100.0
1.deposit 2.withdrawal 3.exit
enter your choice
2
 enter amt to be withdrawn
700
balance got updated to:400.0
a penalty of 100 is imposed
balance got updated to:300.0
1.deposit 2.withdrawal 3.exit
enter your choice
3
----------DETAILS----------
name:aaa
accno:1234
type:curr_Acct
balance:300.0
cheque book facility exist
Arvinds-MacBook-Pro:ooj Arvind$
```

```
Arvinds-MacBook-Pro:ooj Arvind$ java Bank
1.curr_Acct
2.sav acct
enter the type
2
enter name
aaa
enter accno
1234
enter the balance
1000
1.deposit 2.withdrawal 3.exit
enter your choice
1
enter the deposit
300
balance got updated to:1300.0
1.deposit 2.withdrawal 3.exit
enter your choice
2
 enter amt to be withdrawn
100
balance got updated to:1200.0
1.deposit 2.withdrawal 3.exit
enter your choice
3
----------DETAILS----------
name:aaa
accno:1234
type:sav_Acct
a rate of 4.5% is given for deposits in savings bank acc
enter the time duration for which interest to be calc
1
balance:1254,000
cheque book does not facility exist
Arvinds-MacBook-Pro:ooj Arvind$
```