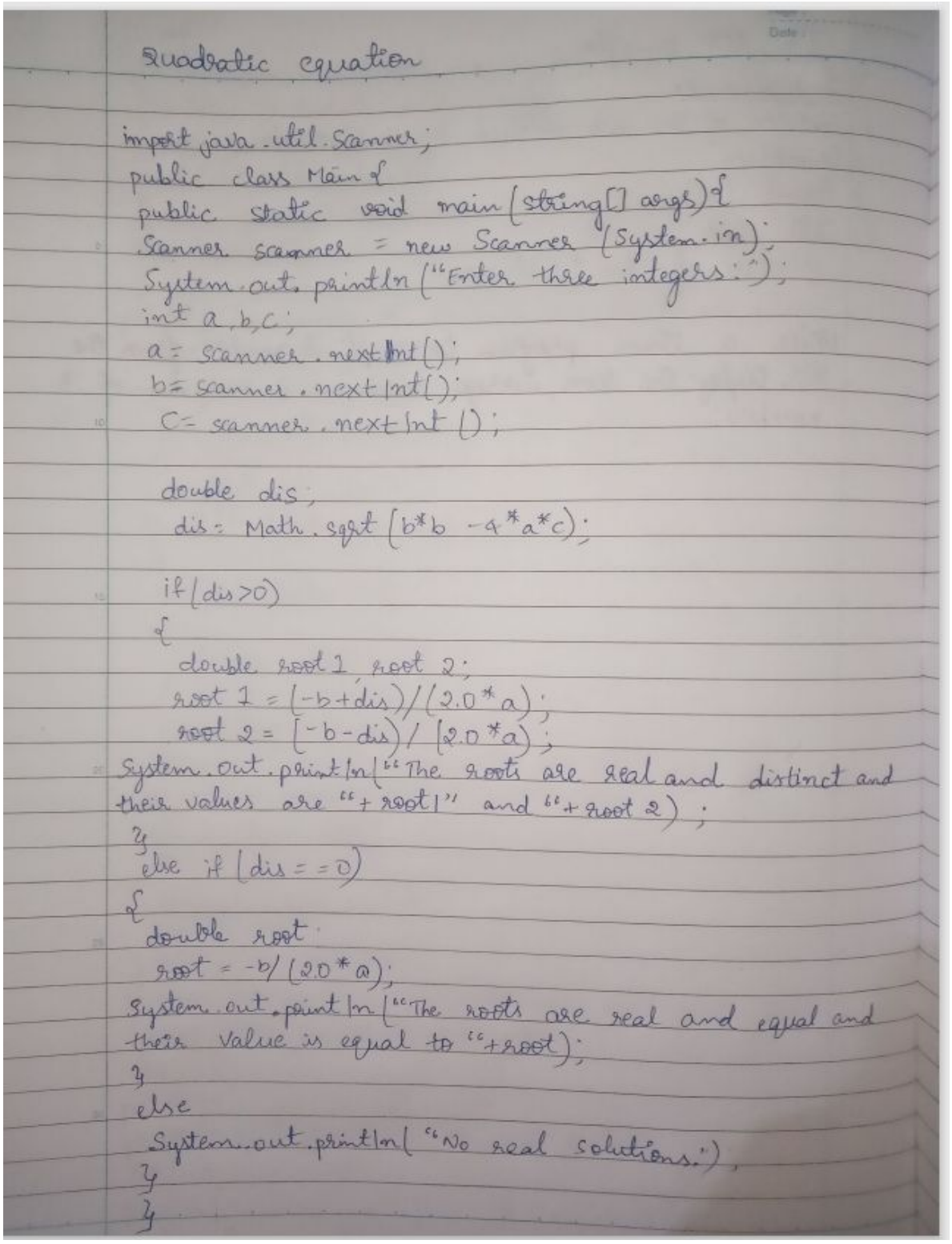
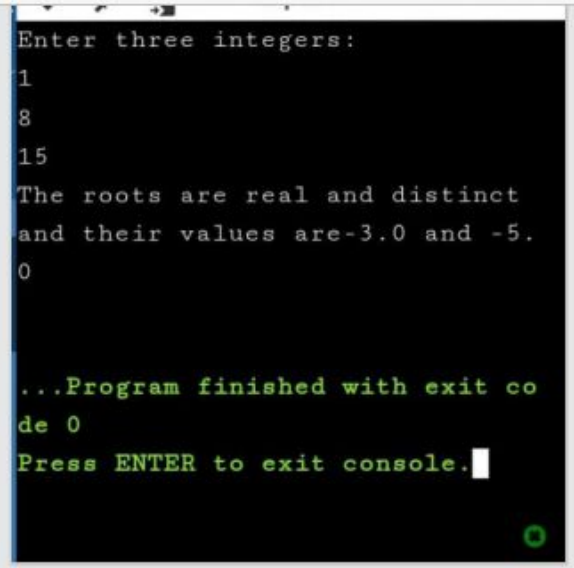
Lab Program 1:

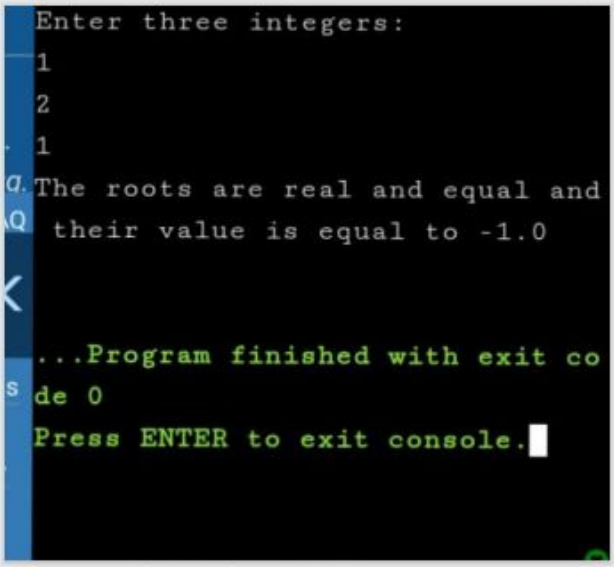
Develop a Java program that prints all real solutions to the quadratic equation ax2 + bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminant b2-4ac is negative, display a message stating that there are no real solutions.

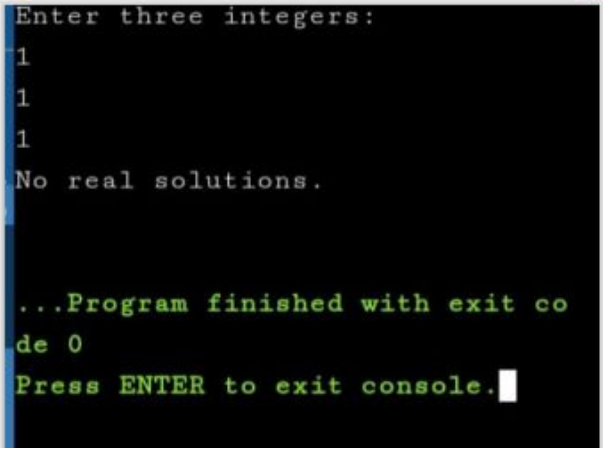


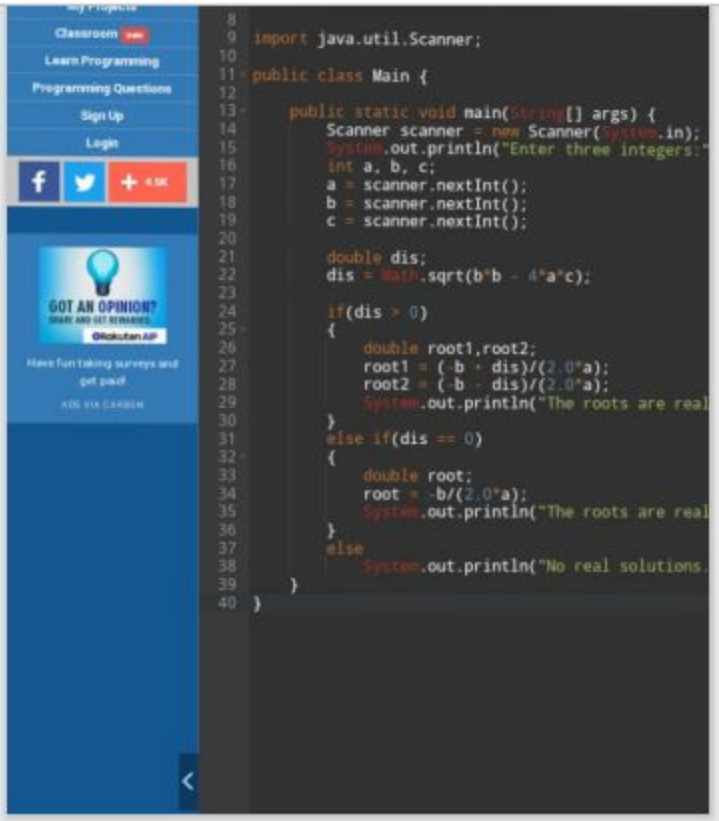
Quadratic equation

```
import java.util.Scanner;
public class Main{
public static void main(String[] args){
Scanner scanner = new Scanner (System.in);
System.out.println("Enter three integers:");
int a,b,c;
a= scanner.nextInt();
b= scanner.nextInt();
c= scanner.nextInt();

double dis;
dis= Math.sqrt(b*b -4*a*c);

if(dis>0)
{
double root1, root2;
root1 =(-b+dis)/(2.0*a);
root2 =(-b-dis)/(2.0*a);
System.out.println("The roots are real and distinct and
their values are "+root1" and "+root2);
}
else if(dis==0)
{
double root
root = -b/(2.0*a);
System.out.println("The roots are real and equal and
their value is equal to "+root);
}
else
System.out.println("No real solutions.");
}
}
```


Enter three integers:
1
8
15
The roots are real and distinct
and their values are-3.0 and -5.
0
...Program finished with exit co
de 0
Press ENTER to exit console.


Enter three integers:
1
2
1
The roots are real and equal and
their value is equal to -1.0
...Program finished with exit co
de 0
Press ENTER to exit console.


Enter three integers:
1
1
1
No real solutions.
...Program finished with exit co
de 0
Press ENTER to exit console.


Classroom
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Login
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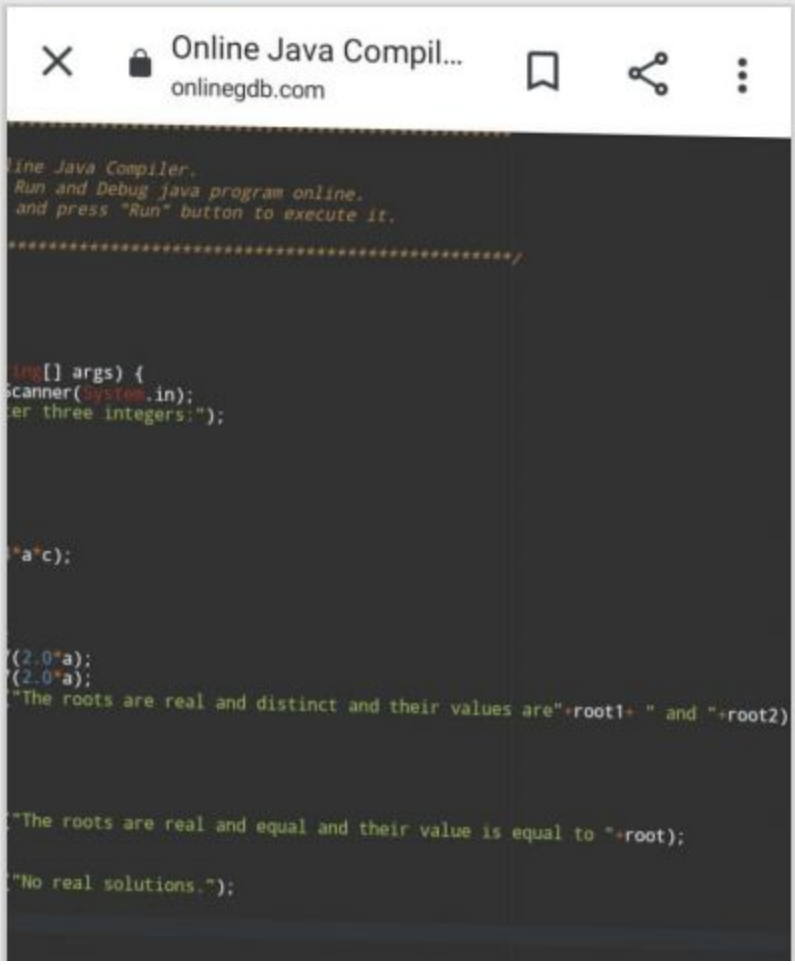
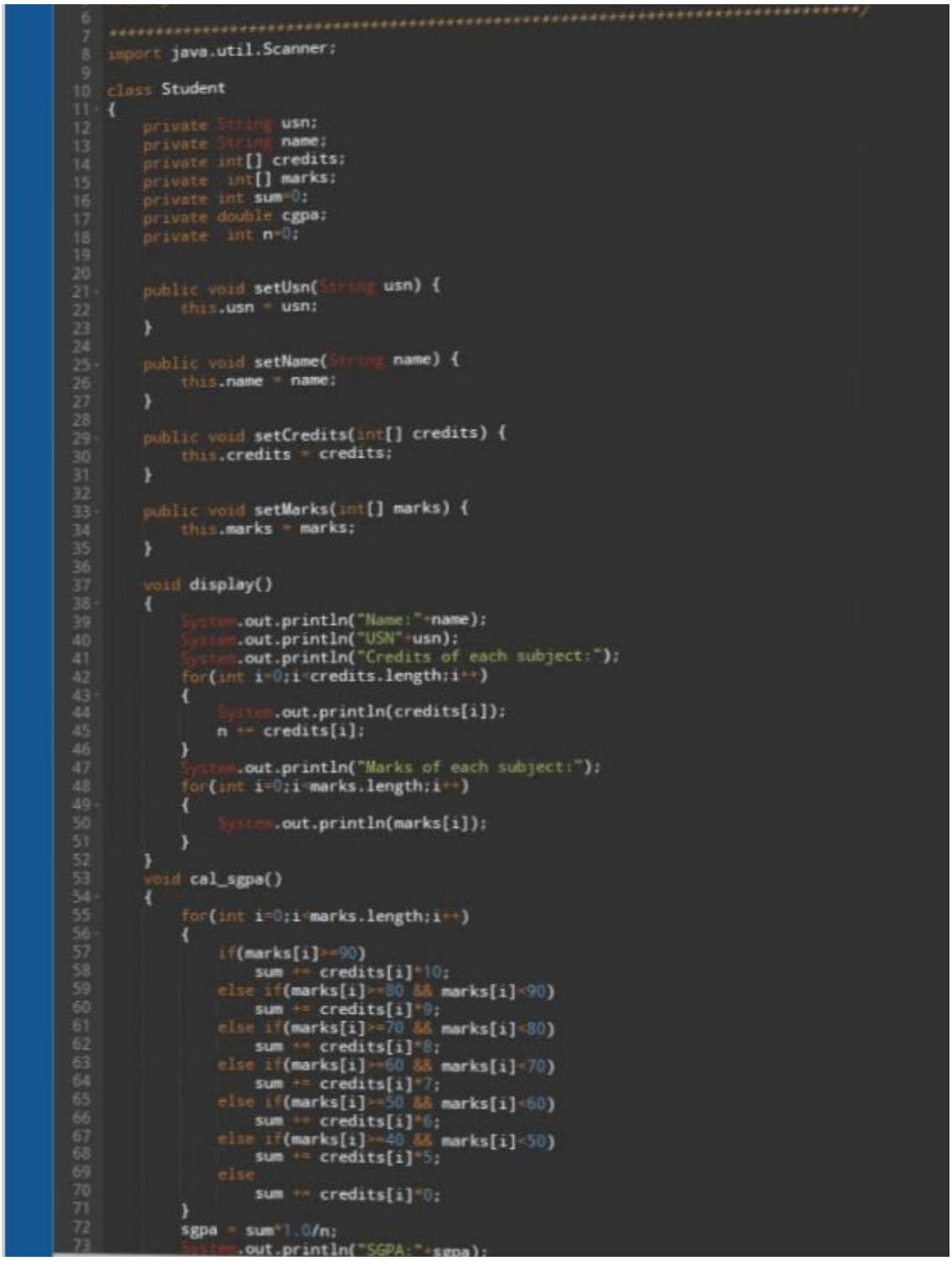
ADS VIA CARBON
import java.util.Scanner;
public class Main {
public static void main(String[] args) {
Scanner scanner = new Scanner(System.in);
System.out.println("Enter three integers:"
int a, b, c;
a = scanner.nextInt();
b = scanner.nextInt();
c = scanner.nextInt();
double dis;
dis = Math.sqrt(b*b - 4*a*c);
if(dis > 0)
{
double root1,root2;
root1 = (-b + dis)/(2.0*a);
root2 = (-b - dis)/(2.0*a);
System.out.println("The roots are real
}
else if(dis == 0)
{
double root;
root = -b/(2.0*a);
System.out.println("The roots are real
}
else
System.out.println("No real solutions.
}
}

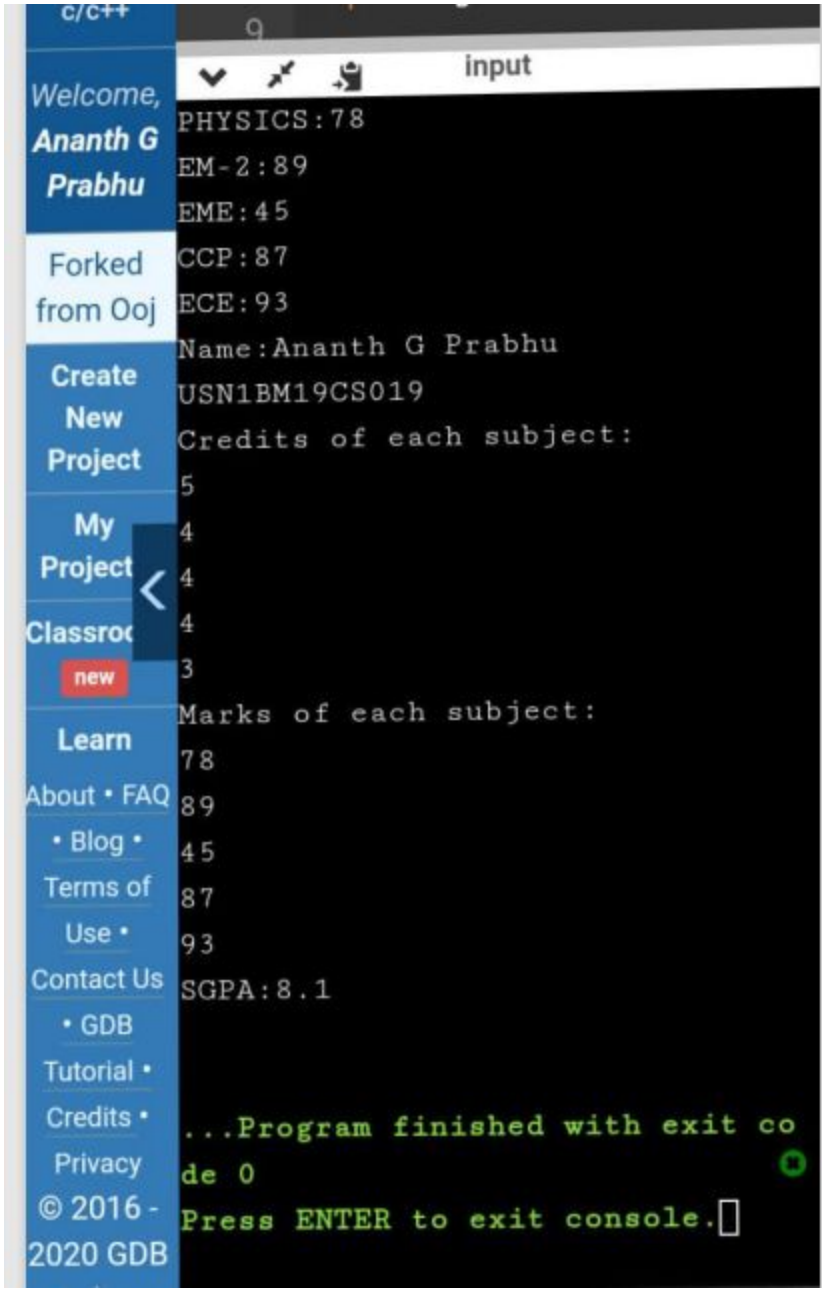

Online Java Compil...
onlinegdb.com
line Java Compiler.
Run and Debug java program online.
and press "Run" button to execute it.
ing[] args) {
Scanner(System.in);
er three integers:");
*a*c);
(2.0*a);
(2.0*a);
"The roots are real and distinct and their values are"+root1+ " and "+root2)
"The roots are real and equal and their value is equal to "+root);
"No real solutions.");

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 the SGPA of a student.



```
/*
*********************************************************************/
import java.util.Scanner;

class Student
{
    private String usn;
    private String name;
    private int[] credits;
    private  int[] marks;
    private int sum=0;
    private double cgpa;
    private  int n=0;


    public void setUsn(String usn) {
        this.usn = usn;
    }

    public void setName(String name) {
        this.name = name;
    }

    public void setCredits(int[] credits) {
        this.credits = credits;
    }

    public void setMarks(int[] marks) {
        this.marks = marks;
    }

    void display()
    {
        System.out.println("Name:"+name);
        System.out.println("USN"+usn);
        System.out.println("Credits of each subject:");
        for(int i=0;i<credits.length;i++)
        {
            System.out.println(credits[i]);
            n += credits[i];
        }
        System.out.println("Marks of each subject:");
        for(int i=0;i<marks.length;i++)
        {
            System.out.println(marks[i]);
        }
    }
    void cal_sgpa()
    {
        for(int i=0;i<marks.length;i++)
        {
            if(marks[i]>=90)
                sum += credits[i]*10;
            else if(marks[i]>=80 && marks[i]<90)
                sum += credits[i]*9;
            else if(marks[i]>=70 && marks[i]<80)
                sum += credits[i]*8;
            else if(marks[i]>=60 && marks[i]<70)
                sum += credits[i]*7;
            else if(marks[i]>=50 && marks[i]<60)
                sum += credits[i]*6;
            else if(marks[i]>=40 && marks[i]<50)
                sum += credits[i]*5;
            else
                sum += credits[i]*0;
        }
        sgpa = sum*1.0/n;
        System.out.println("SGPA:"+sgpa);
```

```
    public void setCredits(int[] credits) {
        this.credits = credits;
    }

    public void setMarks(int[] marks) {
        this.marks = marks;
    }

    void display()
    {
        System.out.println("Name:"+name);
        System.out.println("USN"+usn);
        System.out.println("Credits of each subject:");
        for(int i=0;i<credits.length;i++)
        {
            System.out.println(credits[i]);
            n += credits[i];
        }
        System.out.println("Marks of each subject:");
        for(int i=0;i<marks.length;i++)
        {
            System.out.println(marks[i]);
        }
    }
    void cal_sgpa()
    {
        for(int i=0;i<marks.length;i++)
        {
            if(marks[i]>=90)
                sum += credits[i]*10;
            else if(marks[i]>=80 && marks[i]<90)
                sum += credits[i]*9;
            else if(marks[i]>=70 && marks[i]<80)
                sum += credits[i]*8;
            else if(marks[i]>=60 && marks[i]<70)
                sum += credits[i]*7;
            else if(marks[i]>=50 && marks[i]<60)
                sum += credits[i]*6;
            else if(marks[i]>=40 && marks[i]<50)
                sum += credits[i]*5;
            else
                sum += credits[i]*0;
        }
        sgpa = sum*1.0/n;
        System.out.println("SGPA:"+sgpa);
    }

}
public class Main
{
    public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        int [] credits = new int[]{5,4,4,4,3};
        String [] subject = new String[]{"PHYSICS", "EM-2","EME","CCP","ECE"};
        int[] marks=new int[credits.length];
        for(int i=0;i<credits.length;i++)
        {
            System.out.print(subject[i]+":");
            marks[i]=sc.nextInt();
        }
        Student s = new Student();
        s.setUsn("1BM19CS019");
        s.setName("Ananth G Prabhu");
        s.setMarks(marks);
        s.setCredits(credits);
        s.display();
        s.cal_sgpa();
    }
}
```


c/c++
Welcome, Ananth G Prabhu
Forked from Ooj
Create New Project
My Project
Classroc
new
Learn
About • FAQ • Blog • Terms of Use • Contact Us • GDB Tutorial • Credits • Privacy
© 2016 - 2020 GDB
input
PHYSICS:78
EM-2:89
EME:45
CCP:87
ECE:93
Name:Ananth G Prabhu
USN1BM19CS019
Credits of each subject:
5
4
4
4
3
Marks of each subject:
78
89
45
87
93
SGPA:8.1
...Program finished with exit code 0
Press ENTER to exit console.

Calculation of SGPA

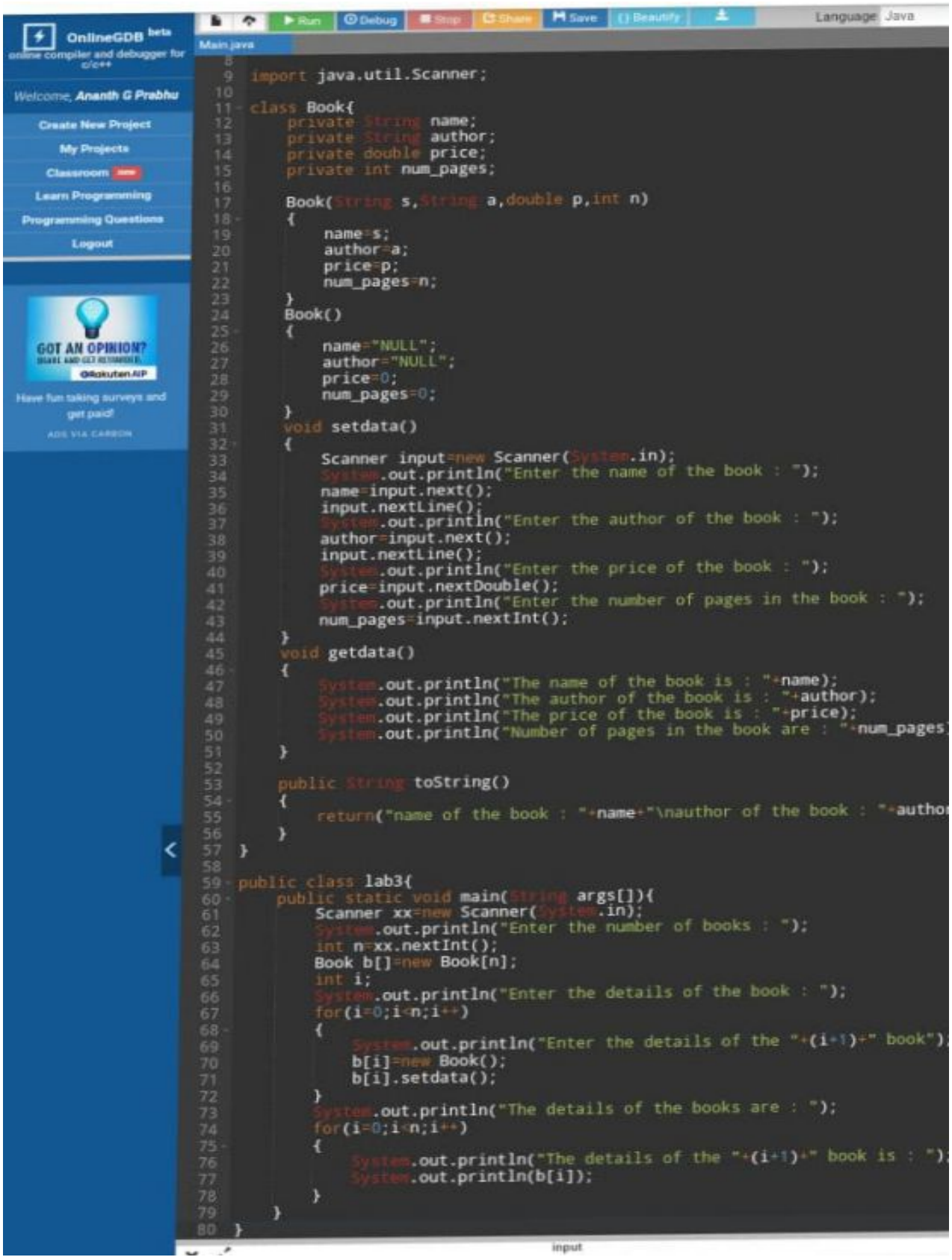
```
import java.util.Scanner;
class Student
{
private String usn;
private String name;
private int[] credits;
private int[] marks;
private int sum=0;
private double sgpa;
private int n=0;

public void setUsn(String usn){
 this.usn=usn;
}
public void setName(String name){
 this.name =name;
}
public void setCredits(int[] credits) {
  this.credits = credits;
}
public void setMarks(int[] marks) {
 this.marks = marks;
}
 void display()
{
System.out.println("Name: "+name);
System.out.println("USN"+usn);
System.out.println("Credits of each subject:");
for(int i=0; i<credits.length; i++)
 {
  System.out.println(credits[i]);
  n+=credits[i];
```

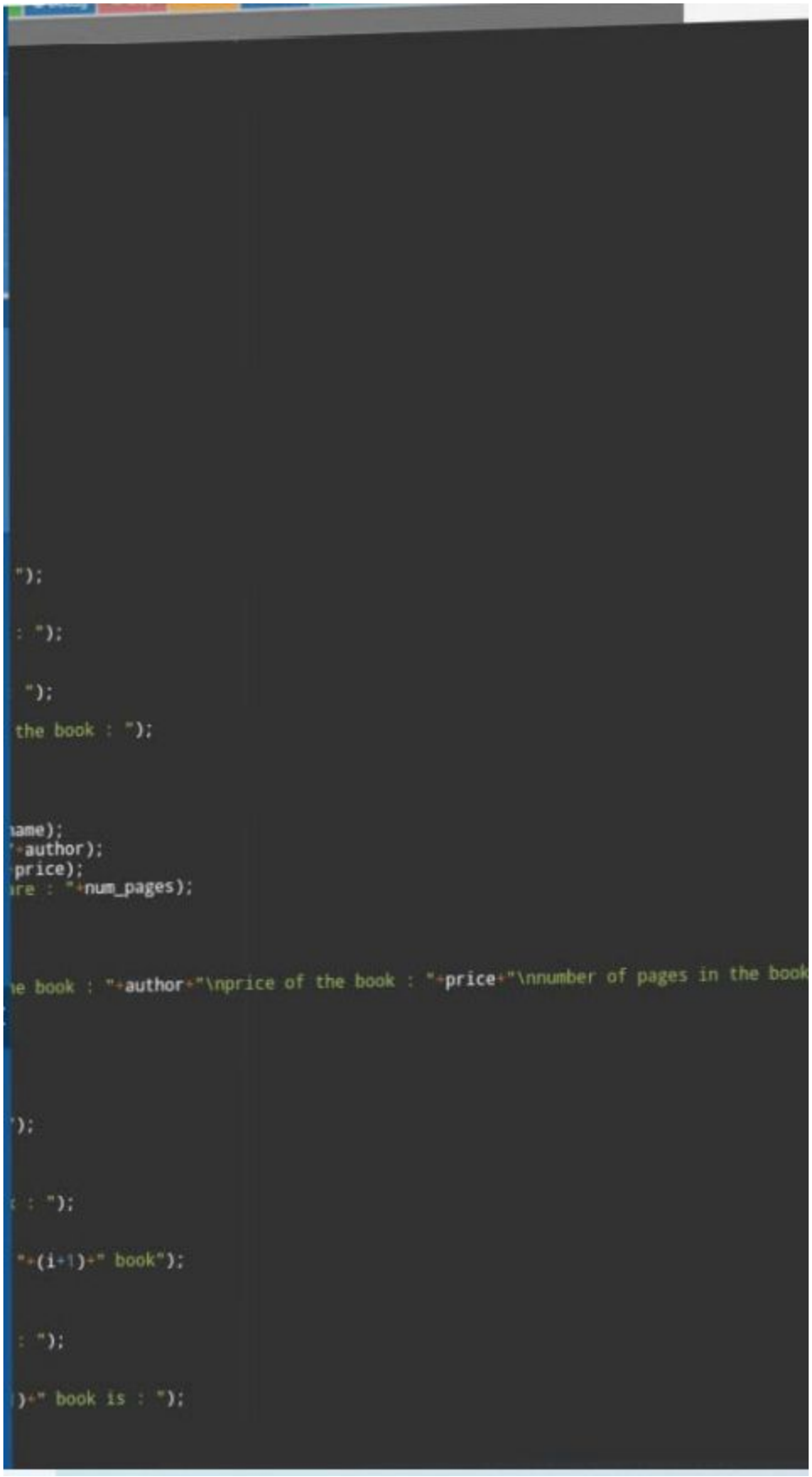
```
Scanner sc = new Scanner(System.in);
int[] credits = new int[]{5,4,4,4,3};
String[] subject = new String[]
{"PHYSICS","EM-2","EME","CCP","ECE"};
int[] marks = new int[credits.length];
for(int i=0; i<credits.length; i++)
{
System.out.print(subject[i]+"\t");
marks[i] = SC.nextInt();
}
```

```
Student S = new Student();
S.setUsn("1BM19CS017");
S.setName("ANANTH G Prabhu");
S.setmarks(marks);
S.setCredits(credits);
S.display();
S.cal_Sgpa();
}
}
```

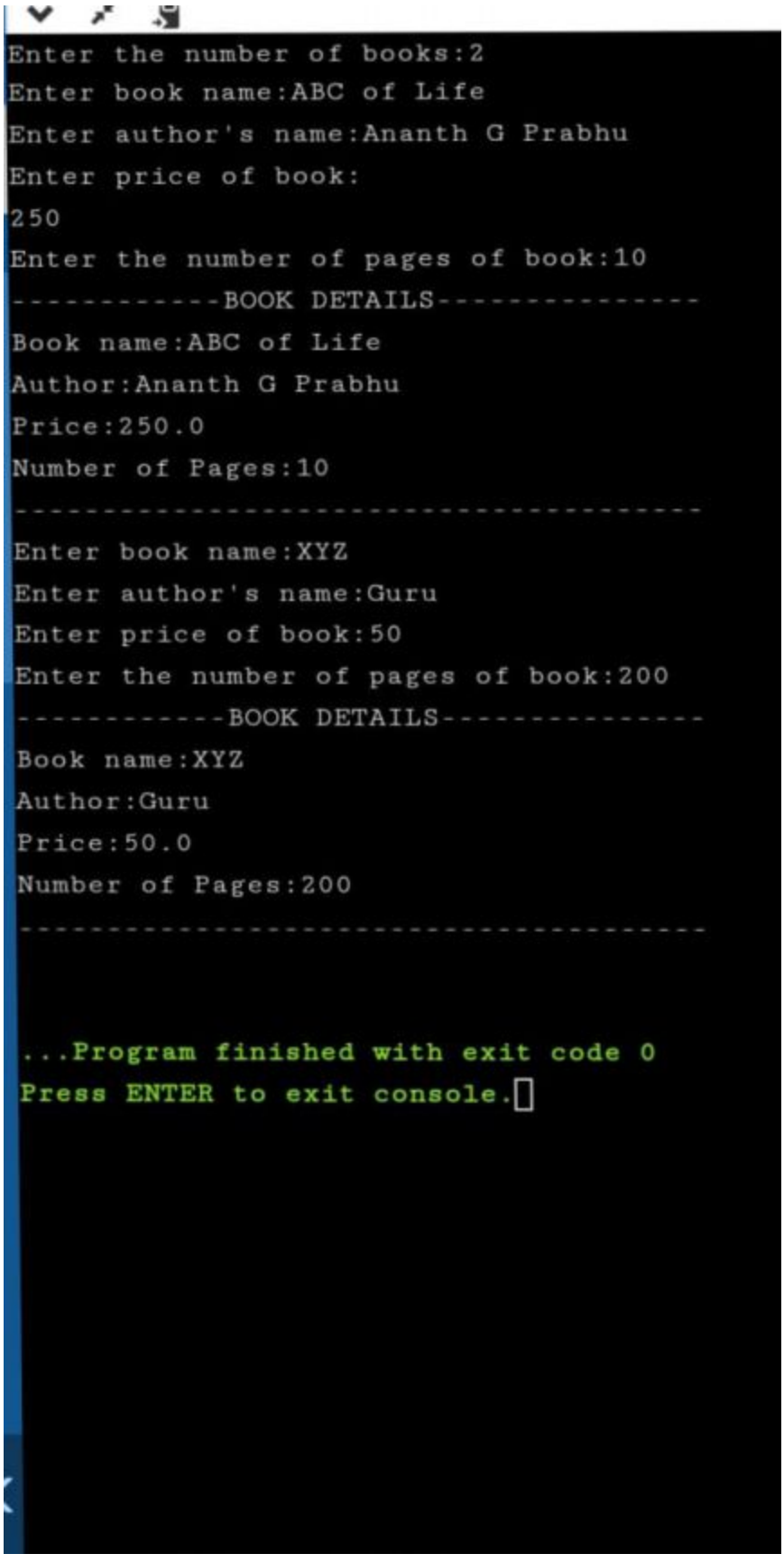
Lab Program - 3

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.


OnlineGDB beta
online compiler and debugger for c/c++
Welcome, Ananth G Prabhu
Create New Project
My Projects
Classroom
Learn Programming
Programming Questions
Logout
GOT AN OPINION?
Have fun taking surveys and get paid!
Run
Debug
Stop
Share
Save
Beautify
Language Java
Main.java
import java.util.Scanner;
class Book{
private String name;
private String author;
private double price;
private int num_pages;
Book(String s,String a,double p,int n)
{
name=s;
author=a;
price=p;
num_pages=n;
}
Book()
{
name="NULL";
author="NULL";
price=0;
num_pages=0;
}
void setdata()
{
Scanner input=new Scanner(System.in);
System.out.println("Enter the name of the book : ");
name=input.next();
input.nextLine();
System.out.println("Enter the author of the book : ");
author=input.next();
input.nextLine();
System.out.println("Enter the price of the book : ");
price=input.nextDouble();
System.out.println("Enter the number of pages in the book : ");
num_pages=input.nextInt();
}
void getdata()
{
System.out.println("The name of the book is : "+name);
System.out.println("The author of the book is : "+author);
System.out.println("The price of the book is : "+price);
System.out.println("Number of pages in the book are : "+num_pages);
}
public String toString()
{
return("name of the book : "+name+"\nauthor of the book : "+author
}
}
public class lab3{
public static void main(String args[]){
Scanner xx=new Scanner(System.in);
System.out.println("Enter the number of books : ");
int n=xx.nextInt();
Book b[]=new Book[n];
int i;
System.out.println("Enter the details of the book : ");
for(i=0;i<n;i++)
{
System.out.println("Enter the details of the "+(i+1)+" book");
b[i]=new Book();
b[i].setdata();
}
System.out.println("The details of the books are : ");
for(i=0;i<n;i++)
{
System.out.println("The details of the "+(i+1)+" book is : ");
System.out.println(b[i]);
}
}
}
input



```
");

: ");

 ");
the book : ");


ame);
+author);
price);
re : "+num_pages);


e book : "+author+"\nprice of the book : "+price+"\nnumber of pages in the book


");


 : ");

"+(i+1)+" book");


 : ");

)+" book is : ");
```


Enter the number of books:2
Enter book name:ABC of Life
Enter author's name:Ananth G Prabhu
Enter price of book:
250
Enter the number of pages of book:10
----------BOOK DETAILS----------
Book name:ABC of Life
Author:Ananth G Prabhu
Price:250.0
Number of Pages:10

Enter book name:XYZ
Enter author's name:Guru
Enter price of book:50
Enter the number of pages of book:200
----------BOOK DETAILS----------
Book name:XYZ
Author:Guru
Price:50.0
Number of Pages:200

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

BOOK JAVA CODE

```
import java.util.Scanner;

class Book
{
  private String book_name;
  private String author;
  private double price;
  private int no_of_pages;

  Book(String s, String a, double p, int n)
  {
   name = s;
   author = a;
   price = p;
   num_pages = n;
  }
  Book()
  {
   name = "NULL";
   author = "NULL";
   price = 0;
   num_pages = 0;
  }
  void Set data()
  {
  Scanner input = new Scanner(System.in);
   System.out.println("Enter the name of the book:");
   name = input.next();
   input.nextLine();
    System.out.println("Enter the author of the book:");
      author = input.next();
      input.nextLine();
    System.out.println("Enter the price of the book:");
```

```
price = input.nextDouble();
System.out.println("Enter the number of pages in the book:");
num_pages = input.nextInt();
}
void getdata()
{
System.out.println("The name of the book is:"+name);
System.out.println("The author of the book is:"+author);
System.out.println("The price of the book is:"+price);
System.out.println("Number of pages in the book are:"+num_pages);
}
public String toString()
{
return("name of the book:"+name+"\nauthor of the book:
"+author+"\n price of the book:"+price+"\n
number of pages in the book:"+num_pages);
}
}
Main
public class ~~Book~~ {
public static void main(String args[]){
Scanner xx = new Scanner(System.in);
System.out.println("Enter the number of books:");
int n= xx.nextInt();
Book b[] = new Book[n];
int i;
System.out.println("Enter the details of the ~~"+(i+1)+" book"~~);
~~b[i]~~ book:");
for(i=0;i<n;i++)
{
System.out.println("Enter the details of the"+(i+1)+"book");
b[i]=new Book();
b[i].setdata();
}
```

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

week8a - Notepad

File Edit Format View Help

```
        public void print_area()
        {
                area_tri=(geta()*getb())/2;
                System.out.println("The area of triangle is:"+area_tri);
        }
}
class circle extends shape
{
        private double area_circle;
        circle(int y)
        {
                setshape(0,y);
        }
        public void print_area()
        {
                area_circle=((3.14)*getb()*getb());
                System.out.println("Area of circle is:"+area_circle);
        }
}
public class week8a
{
        public static void main(String[]args){
                Scanner xx=new Scanner(System.in);
                int a,b;
                System.out.println("Enter the length of rectangle : ");
                a=xx.nextInt();
                System.out.println("Enter the breadth of rectangle : ");
                b=xx.nextInt();
                rectangle r= new rectangle(a,b);
                r.print_area();
                System.out.println("Enter the height of triangle : ");
                a=xx.nextInt();
                System.out.println("Enter the base of triangle : ");
                b=xx.nextInt();
                triangle t= new triangle(a,b);
                t.print_area();
                System.out.println("Enter the radius of circle : ");
                a=xx.nextInt();
                circle c= new circle(a);
                c.print_area();
        }
}
```

```
C:\Users\anant\JAVA A>javac week8a.java

C:\Users\anant\JAVA A>java week8a
Enter the length of rectangle :
6
Enter the breadth of rectangle :
3
Area of rectangle is:18
Enter the height of triangle :
9
Enter the base of triangle :
3
The area of triangle is:13.0
Enter the radius of circle :
2
Area of circle is:12.56

C:\Users\anant\JAVA A>
```

Abstract class of shapes

```
import java.util.Scanner;
abstract class shape;
{
    private int a, b;
    void set shape(int x, int y)
    {
        a=x;
        b=y;
    }
    int get a()
    {
     return a;
    }
    int get b()
    {
     return b;
    }
    abstract public void print_area();
}
class rectangle extends shape
{
    private int area_rect;
    rectangle(int x, int y)
    {
      set shape(x,y);
    }
     public void print_area()
     {
      area_rect = get a() * get b();
      System.out.println("Area of rectangle :" + area_rect);
     }
}
```

```
class triangle extends shape
{
private double area_tri;
triangle( int x, int y)
{
  set shape (x,y);
}
public void print_area()
{
 area_tri=(get a()* get b())/2;
System.out.println("The area of triangle is :" +area_tri);
}
}
class circle extends shape
{
  private double area_circle;
   circle(int y)
{
   set shape (0, y);
}
 public void print_area()
{
  area_circle = ((3.14)* get b()* get b());
  System.out.println("Area of circle is :" +area_circle);
}
}
 public class week8a
{
 public static void main(String [] args){
   Scanner xx= new Scanner (System.in);
 int a, b;
System.out.println("Enter the length of rectangle ");
 a=xx.nextInt();
```

week8a - Notepad

File Edit Format View Help

```
import java.util.Scanner;
abstract class shape
{
        private int a,b;
        void setshape(int x,int y)
        {
                a=x;
                b=y;
        }
        int geta()
        {
                return a;
        }
        int getb()
        {
                return b;
        }
        abstract public void print_area();
}
class rectangle extends shape
{
        private int area_rect;
        rectangle(int x,int y)
        {
                setshape(x,y);
        }
        public void print_area()
        {
                area_rect=geta()*getb();
                System.out.println("Area of rectangle is:"+area_rect);
        }
}
class triangle extends shape
{
        private double area_tri;
        triangle(int x,int y)
        {
                setshape(x,y);
        }
        public void print_area()
        {
                area_tri=(geta()*getb())/2;
```

```
System.out.println("Enter the breadth of rectangle:");
  b=xx.nextInt();
rectangle r= new rectangle (a, b);
r.print_area();
System.out.println("Enter the height of triangle:");
a=xx.nextInt();
System.out.println("Enter the base of triangle:");
b=xx.nextInt();
triangle t= new triangle(a,b);
t.print_area();
System.out.println("Enter the radius of circle:");
a= xx.nextInt();
circle c= new circle(a);
 c.print_area();
}
}
```

LAB 5

6.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

week8b - Notepad

File Edit Format View Help

```
import java.util.Scanner;

class Account
{
        private String name;
        private double account_no;
        private char account_type;
        private double balance;

        void getdata(char ch)
        {
                Scanner xx=new Scanner(System.in);
                System.out.print("Enter the name of the customer : ");
                name=xx.next();
                xx.nextLine();
                System.out.print("Enter the account number of the customer : ");
                account_no=xx.nextDouble();
                System.out.print("Enter the balance of the customer : ");
                balance=xx.nextDouble();
                account_type=ch;

        }
        void updatebalance(double x)
        {
                balance=balance+x;
        }
        void updatebalance1(double x)
        {
                balance=balance-x;
        }
        double getbalance()
        {
                return balance;
        }
        void displaybalance()
        {
                System.out.println("The balance is : "+balance);
        }
}

class Saving_Account extends Account{
        private double interest_rate;
```

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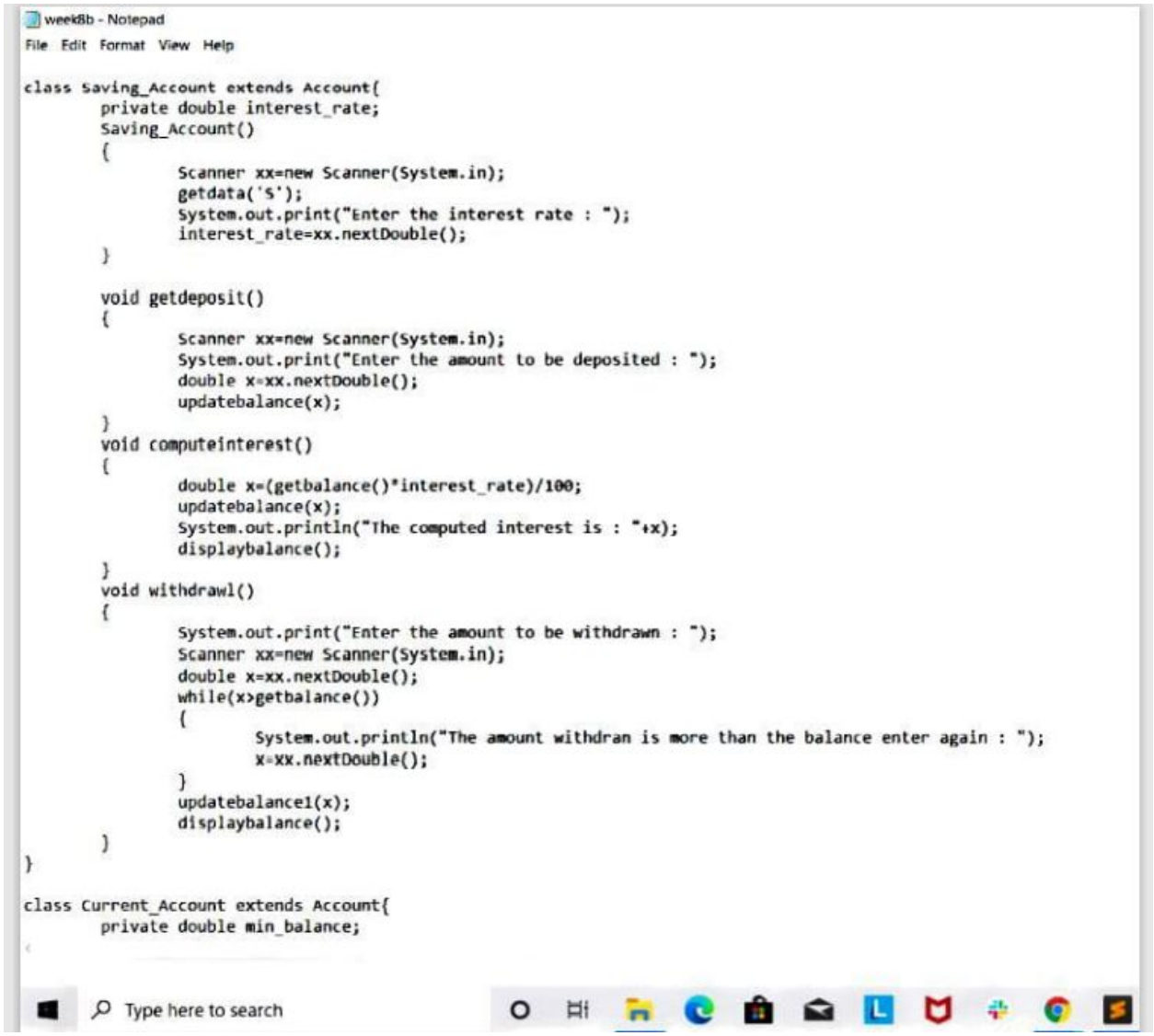
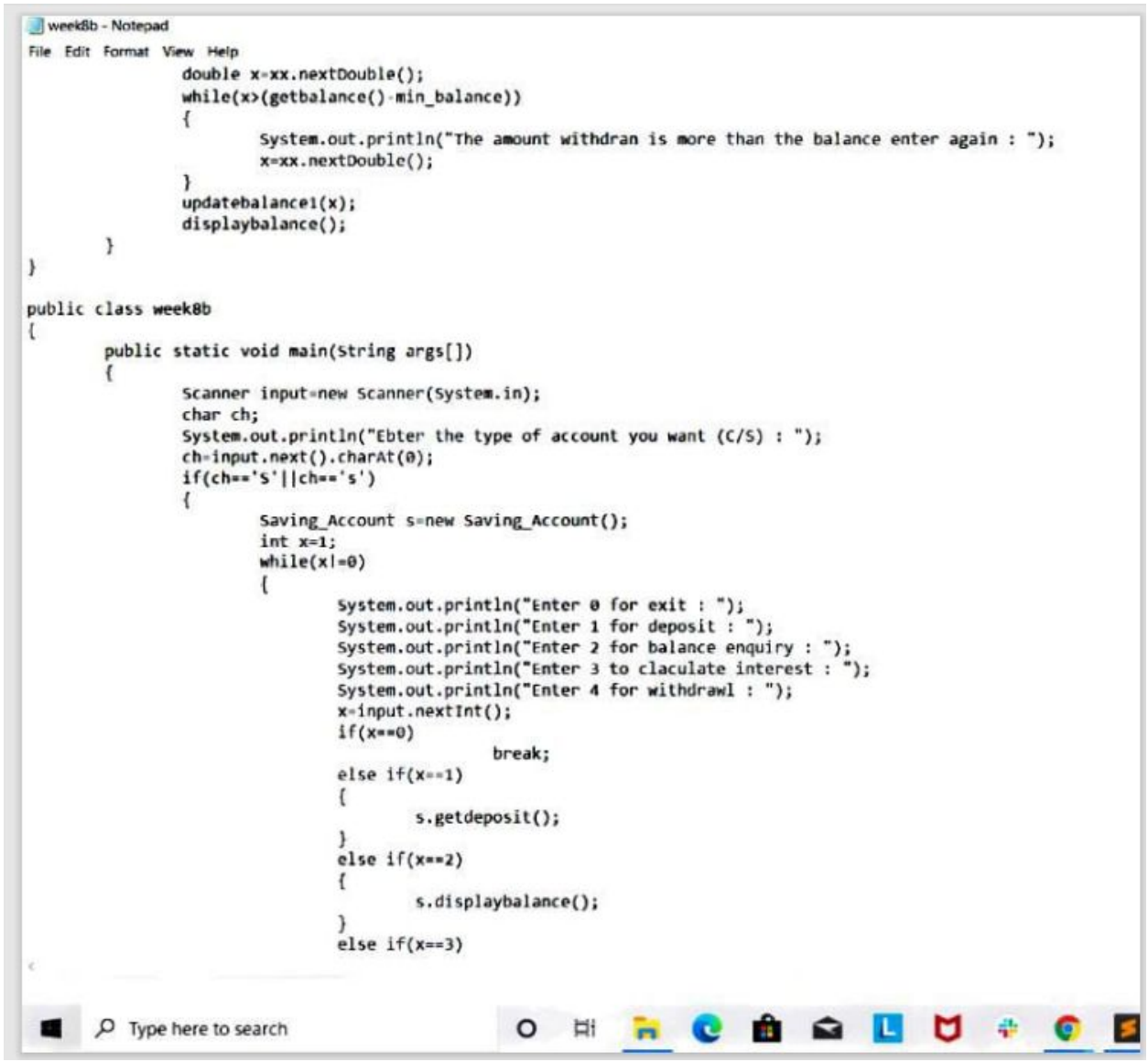

week8b - Notepad
File Edit Format View Help
class Saving_Account extends Account{
private double interest_rate;
Saving_Account()
{
Scanner xx=new Scanner(System.in);
getdata('S');
System.out.print("Enter the interest rate : ");
interest_rate=xx.nextDouble();
}
void getdeposit()
{
Scanner xx=new Scanner(System.in);
System.out.print("Enter the amount to be deposited : ");
double x=xx.nextDouble();
updatebalance(x);
}
void computeinterest()
{
double x=(getbalance()*interest_rate)/100;
updatebalance(x);
System.out.println("The computed interest is : "+x);
displaybalance();
}
void withdrawl()
{
System.out.print("Enter the amount to be withdrawn : ");
Scanner xx=new Scanner(System.in);
double x=xx.nextDouble();
while(x>getbalance())
{
System.out.println("The amount withdran is more than the balance enter again : ");
x=xx.nextDouble();
}
updatebalance1(x);
displaybalance();
}
}
class Current_Account extends Account{
private double min_balance;
Type here to search

week8b - Notepad

File Edit Format View Help

```
class Current_Account extends Account{
        private double min_balance;
        private int cheque_book;
        Current_Account()
        {
                Scanner xx=new Scanner(System.in);
                getdata('C');
                System.out.print("Enter the minimum balance : ");
                min_balance=xx.nextDouble();
        }

        void getdeposit()
        {
                Scanner xx=new Scanner(System.in);
                System.out.print("Enter the amount to be deposited : ");
                double x=xx.nextDouble();
                updatebalance(x);
        }
        void issuecheck()
        {
                Scanner xx=new Scanner(System.in);
                System.out.print("Enter the amount of the check : ");
                double x=xx.nextDouble();
                if(x>(getbalance()-min_balance))
                {
                        System.out.println("You have issued check of more than the minmum balance and you have been charged the penalty of 100 rupees");
                        updatebalance1(100);
                }
                else
                {
                        updatebalance1(x);
                }
                displaybalance();
        }
        void withdrawl()
        {
                System.out.print("Enter the amount to be withdrawn : ");
                Scanner xx=new Scanner(System.in);
                double x=xx.nextDouble();
                while(x>(getbalance()-min_balance))
                {
```


week8b - Notepad

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```
                double x=xx.nextDouble();
                while(x>(getbalance()-min_balance))
                {
                        System.out.println("The amount withdran is more than the balance enter again : ");
                        x=xx.nextDouble();
                }
                updatebalance1(x);
                displaybalance();
        }
}

public class week8b
{
        public static void main(String args[])
        {
                Scanner input=new Scanner(System.in);
                char ch;
                System.out.println("Ebter the type of account you want (C/S) : ");
                ch=input.next().charAt(0);
                if(ch=='S'||ch=='s')
                {
                        Saving_Account s=new Saving_Account();
                        int x=1;
                        while(x!=0)
                        {
                                System.out.println("Enter 0 for exit : ");
                                System.out.println("Enter 1 for deposit : ");
                                System.out.println("Enter 2 for balance enquiry : ");
                                System.out.println("Enter 3 to claculate interest : ");
                                System.out.println("Enter 4 for withdrawl : ");
                                x=input.nextInt();
                                if(x==0)
                                        break;
                                else if(x==1)
                                {
                                        s.getdeposit();
                                }
                                else if(x==2)
                                {
                                        s.displaybalance();
                                }
                                else if(x==3)
```

Type here to search

week8b - Notepad

File Edit Format View Help

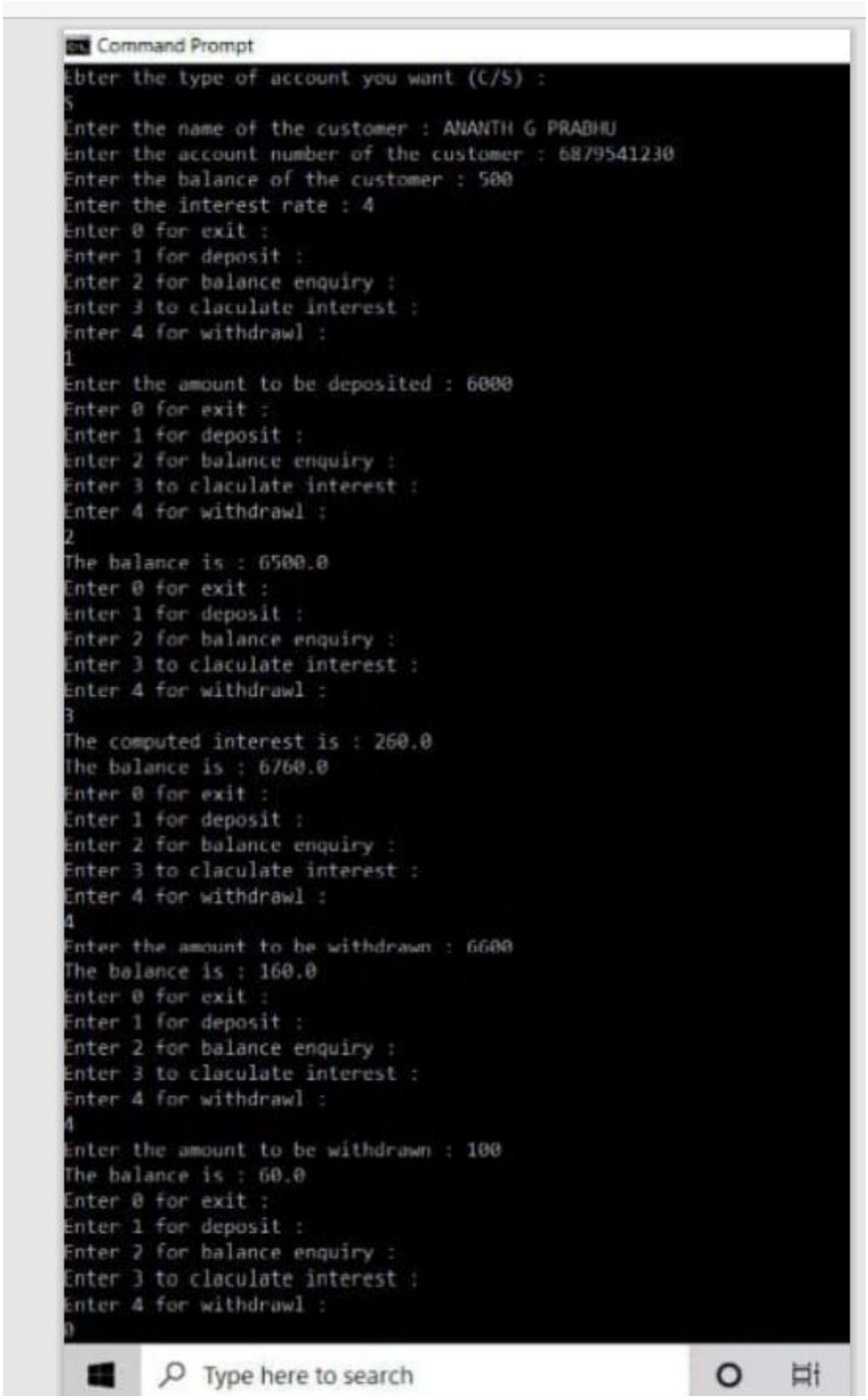
```
                                        s.displaybalance();
                                }
                                else if(x==3)
                                {
                                        s.computeinterest();
                                }
                                else if(x==4)
                                {
                                        s.withdrawl();
                                }

                        }
                }
                else
                {
                        Current_Account s=new Current_Account();
                        int x=1;
                        while(x!=0)
                        {
                                System.out.println("Enter 0 for exit : ");
                                System.out.println("Enter 1 for deposit : ");
                                System.out.println("Enter 2 for balance enquiry : ");
                                System.out.println("Enter 3 to apply for cheque : ");
                                System.out.println("Enter 4 for withdrawl : ");
                                x=input.nextInt();
                                if(x==0)
                                                break;
                                else if(x==1)
                                {
                                        s.getdeposit();
                                }
                                else if(x==2)
                                {
                                        s.displaybalance();
                                }
                                else if(x==3)
                                {
                                        s.issuecheck();
                                }
                                else if(x==4)
                                {
                                        s.withdrawl();
```

week8b - Notepad

File Edit Format View Help

```
                        else if(x==4)
                        {
                                s.withdrawl();
                        }

                }
        }
        else
        {
                Current_Account s=new Current_Account();
                int x=1;
                while(x!=0)
                {
                        System.out.println("Enter 0 for exit : ");
                        System.out.println("Enter 1 for deposit : ");
                        System.out.println("Enter 2 for balance enquiry : ");
                        System.out.println("Enter 3 to apply for cheque : ");
                        System.out.println("Enter 4 for withdrawl : ");
                        x=input.nextInt();
                        if(x==0)
                                        break;
                        else if(x==1)
                        {
                                s.getdeposit();
                        }
                        else if(x==2)
                        {
                                s.displaybalance();
                        }
                        else if(x==3)
                        {
                                s.issuecheck();
                        }
                        else if(x==4)
                        {
                                s.withdrawl();
                        }

                }
        }
    }
}
```


Command Prompt
Microsoft Windows [Version 10.0.19041.572]
(c) 2020 Microsoft Corporation. All rights reserved.
C:\Users\anant>cd JAVA A
C:\Users\anant\JAVA A>javac week8b.java
C:\Users\anant\JAVA A>java week8b
Ebter the type of account you want (C/S) :
C
Enter the name of the customer : Ananth G Prabhu
Enter the account number of the customer : 1575855255
Enter the balance of the customer : 6000
Enter the minimum balance : 2000
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to apply for cheque :
Enter 4 for withdrawl :
1
Enter the amount to be deposited : 5778
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to apply for cheque :
Enter 4 for withdrawl :
2
The balance is : 11778.0
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to apply for cheque :
Enter 4 for withdrawl :
3
Enter the amount of the check : 3800
The balance is : 7978.0
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to apply for cheque :
Enter 4 for withdrawl :
4
Enter the amount to be withdrawn : 900
The balance is : 7078.0
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to apply for cheque :
Enter 4 for withdrawl :
0
Type here to search


Command Prompt
Ebter the type of account you want (C/S) :
S
Enter the name of the customer : ANANTH G PRABHU
Enter the account number of the customer : 6879541230
Enter the balance of the customer : 500
Enter the interest rate : 4
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to claculate interest :
Enter 4 for withdrawl :
1
Enter the amount to be deposited : 6000
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to claculate interest :
Enter 4 for withdrawl :
2
The balance is : 6500.0
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to claculate interest :
Enter 4 for withdrawl :
3
The computed interest is : 260.0
The balance is : 6760.0
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to claculate interest :
Enter 4 for withdrawl :
4
Enter the amount to be withdrawn : 6600
The balance is : 160.0
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to claculate interest :
Enter 4 for withdrawl :
4
Enter the amount to be withdrawn : 100
The balance is : 60.0
Enter 0 for exit :
Enter 1 for deposit :
Enter 2 for balance enquiry :
Enter 3 to claculate interest :
Enter 4 for withdrawl :
0
Type here to search

Savings Account and Current account

```
import java.util.Scanner;
class Account
{
  private String name;
  private double account_no;
  private char account_type;
  private double balance;
  void getdata(char ch)
  {
    Scanner xx=new Scanner(System.in);
    System.out.print("Enter the name of the customer:");
    name=xx.next();
    xx.nextLine();
  System.out.print("Enter the account number of customer:");
  account_no=xx.nextDouble();
  System.out.print("Enter the balance of the customer:");
    balance=xx.nextDouble();
    account_type=ch;
  }
    void updatebalance(double x)
  {
      balance=balance+x;
  }
  void updatebalance1(double x)
  {
    balance=balance-x;
  }
    double getbalance()
  {
    return balance;
  }
    void displaybalance()
  {
```

```
System.out.println("The balance is :" +balance);
}
}
class Saving-Account extends Account{
    private double interest-rate;
    Saving-Account()
{
Scanner xx = new Scanner (System.in);
getdata ('S');
System.out.print("Enter the interest rate :");
    interest-rate = xx.nextDouble();
}
 void getdeposit()
{
  Scanner xx = new Scanner(System.in);
  System.out.print("Enter the amount to be deposited:");
   double x = xx.next Double();
   update.balance.(x);
}
 void compute.interest()
{
double x = (get balance.()* interest-rate)/100;
  update.balance.(x);
 System.out.println("The computed interest is:" +x);
  display balance.();
}
 void withdraw()
{
  System.out.print("Enter the amount to be withdrawn:");
   Scanner xx = new Scanner (System.in);
    double x = xx.next Double();
     while(x>get balance())
    {
```

```
System.out.println("The amount withdrawn is more than
the balance enter again : ");
x = xx.nextDouble();
}
updatebalance1(x);
displaybalance();
}
}
class Current_Account extends Account {
private double min_balance;
private int cheque_book;
Current_Account()
{
Scanner xx = new Scanner(System.in);
getdata('c');
system.out.print("Enter the minimum balance : ");
min_balance = xx.nextDouble();
}
void getdeposit()
{
Scanner xx = new Scanner(System.in);
System.out.print("Enter the amount to be deposited ");
double x = xx.nextDouble();
update balance(x);
}
void issuecheck()
{
Scanner xx = new Scanner(System.in);
System.out.print("Enter the amount of the check: ");
double x = xx.nextDouble();
if (x > (getbalance() - min_balance))
{
```

```
System.out.println("You have issued check of more than the
minimum balance & you have been charged the penalty of
100 rupees");
update balance1(100);
}
else
{
 update balance1(x);
}
displaybalance();
}
 void withdrawl()
{
System.out.print("Enter the amount to be withdrawn:");
  Scanner xx = new Scanner(System.in);
double x = xx.next Double();
while(x>(get balance() - min - balance))
{
System.out.println("The amount withdrawn is more than
the balance enter again:");
 x = xx.nextDouble();
}
 update balance1(x);
displaybalance();
 }
}
public class week8b
{
  public static void main(string args[])
{
  Scanner input = new Scanner(System.in);
   Char ch;
System.out.println("Enter the type of account you want
                    (C/S):");
```

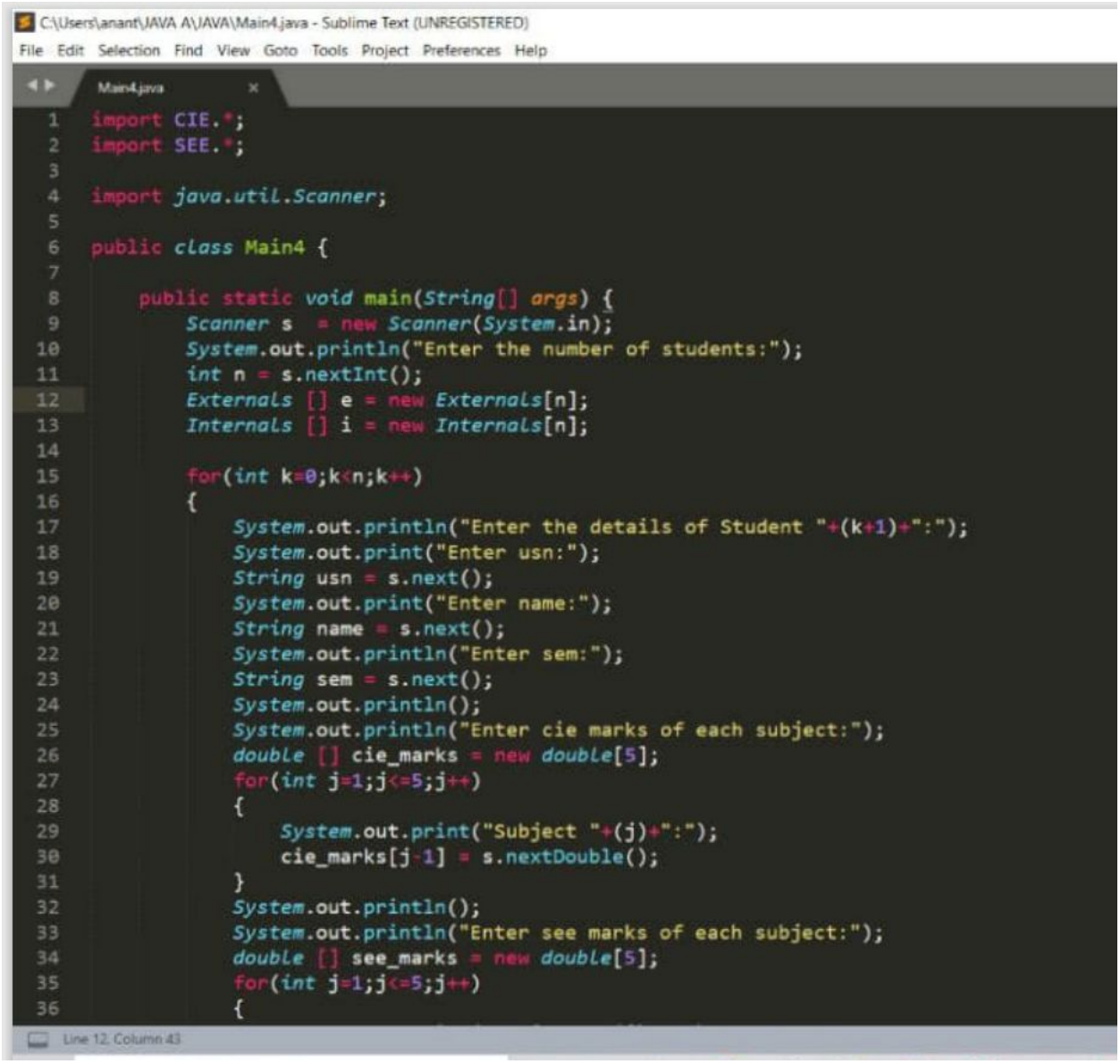
```
ch= input.next().charAt(0);
if(ch== 'S' || ch== 's')
{
Saving_Account s= new Saving_Account();
int x=1;
while(x!=0)
{
System.out.println("Enter 0 for exit: ");
System.out.println("Enter 1 for deposit: ");
System.out.println("Enter 2 for balance enquiry: ");
System.out.println("Enter 3 to calculate interest: ");
System.out.println("Enter 4 for withdrawl: ");
x=input.nextInt();
if(x==0)
  break;
else if(x==1)
{
 s.getdeposit();
}
 else if(x==2)
{
 s.displaybalance();
}
 else if(x==3)
{
  s.computeinterest();
}
 else if(x==4)
{
  s.withdrawl();
}
}
}
```

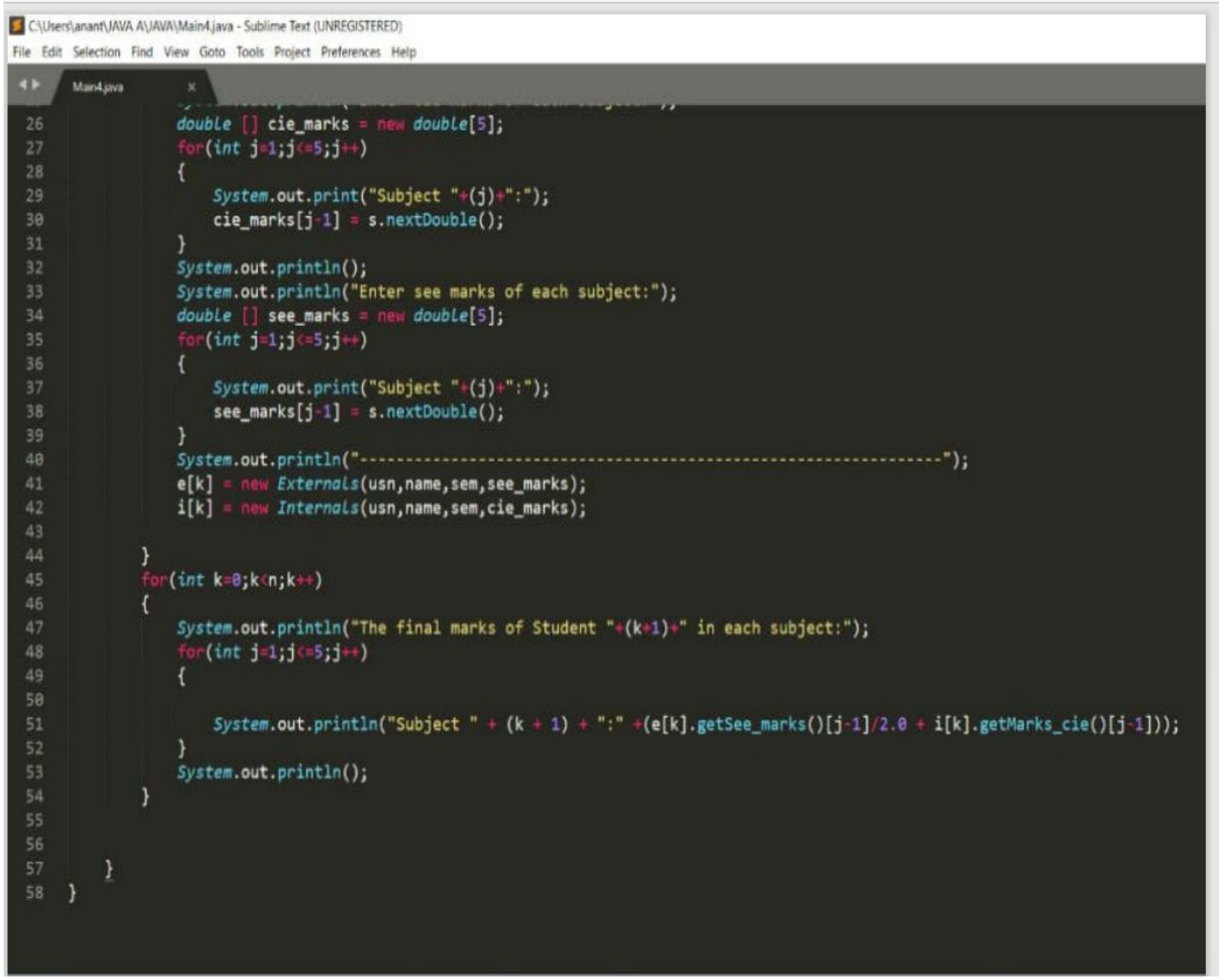
```
else
{
Current_Account S = new Current_Account();
 int x=1;
 while (x!=0)
{
System.out.println("Enter 0 for exit :");
System.out.println("Enter 1 for deposit :");
System.out.println("Enter 2 for balance enquiry :");
System.out.println("Enter 3 to apply for cheque :");
System.out.println("Enter 4 for withdraw :");
 x=input.nextInt();
 if (x==0)
  break;
 else if (x==1)
 {
   S.getdeposit();
 }
 else if (x==2)
 {
 S.displaybalance();
 }
 else if (x==3)
 {
 S.issuecheck();
 }
 else if (x==4)
 {
 S.withdrawl();
 }
 }
 }
 }
 }
```

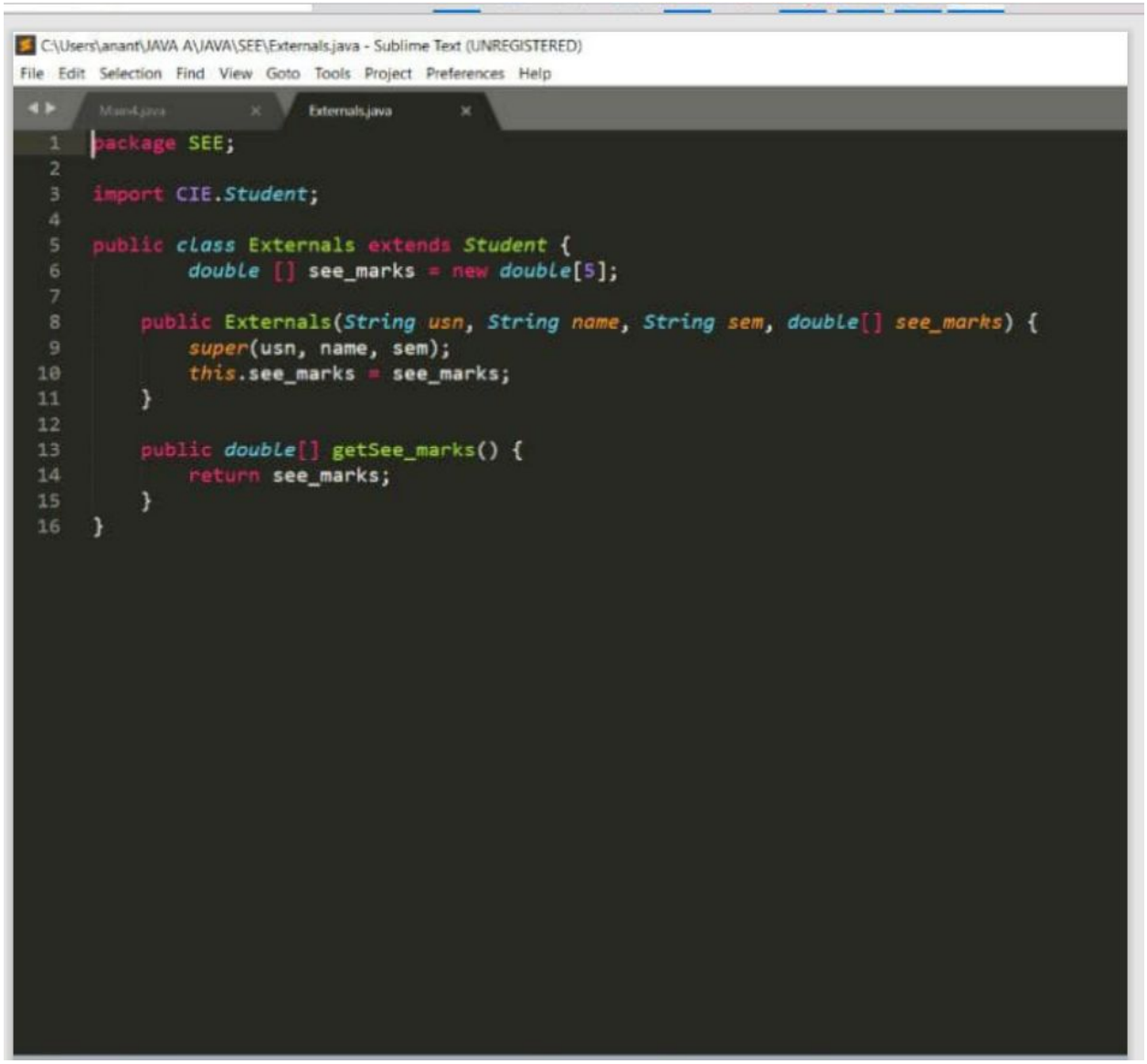
Lab Program 6

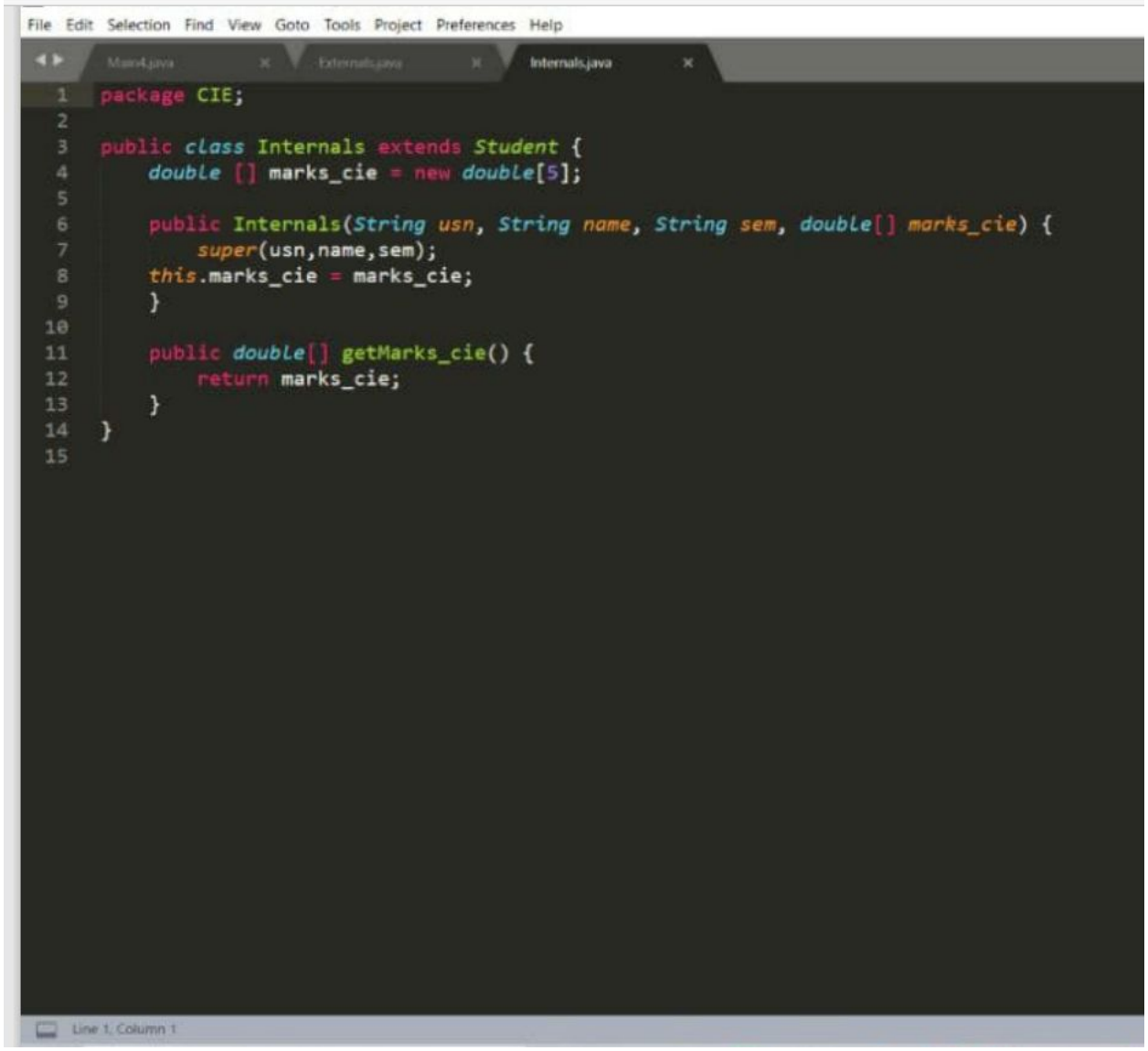
Solve this program and write the procedure you have used to execute this in your observation

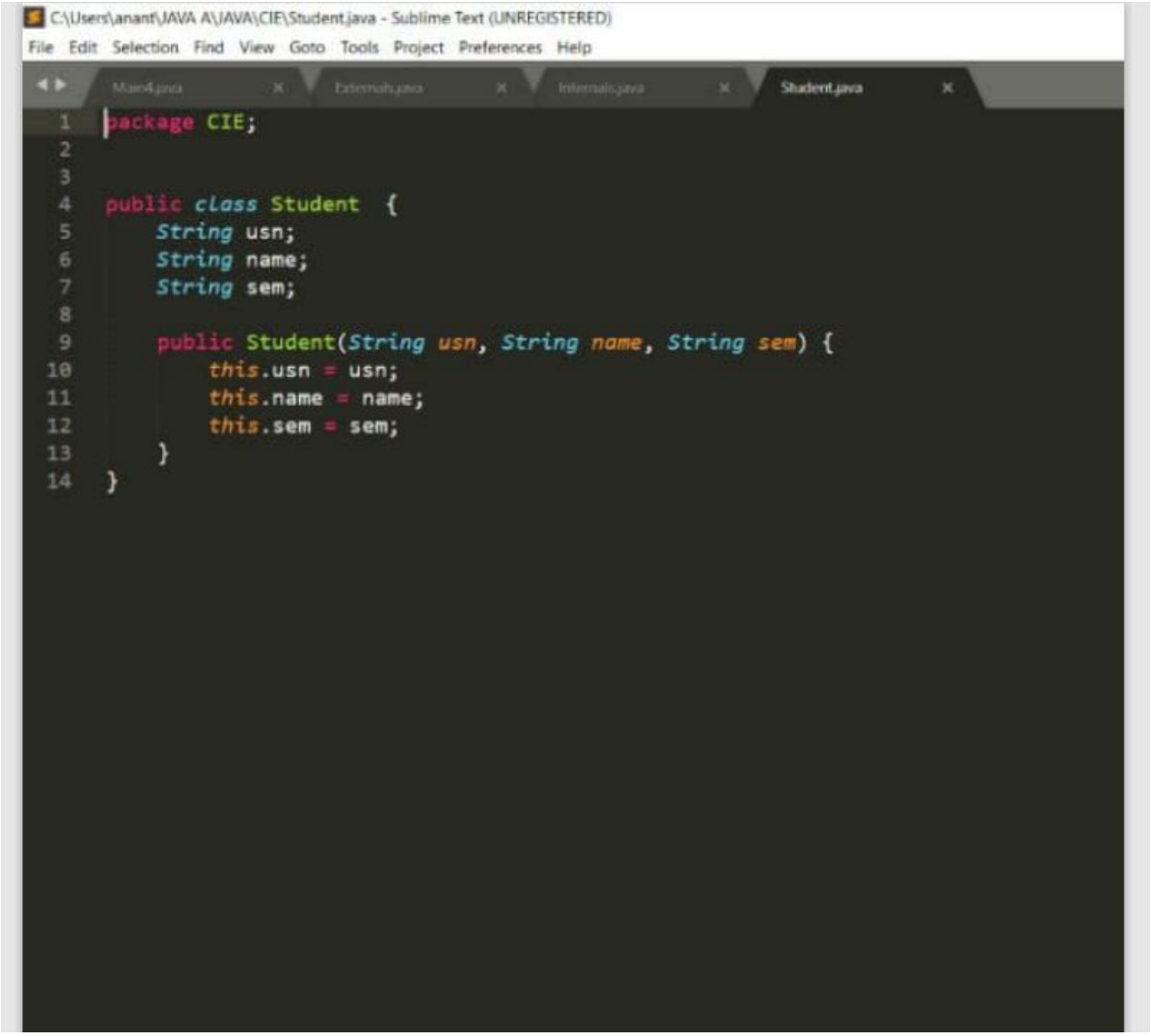
Create a package CIE which has two classes- Student and Internals. The class Personal has members like usn, name, sem. The class Internals has an array that stores the internal marks scored in five courses of the current semester of the student. Create another package SEE which has the class External which is a derived class of Student. This class has an array that stores the SEE marks scored in five courses of the current semester of the student. Import the two packages in a file that declares the final marks of n students in all five courses.

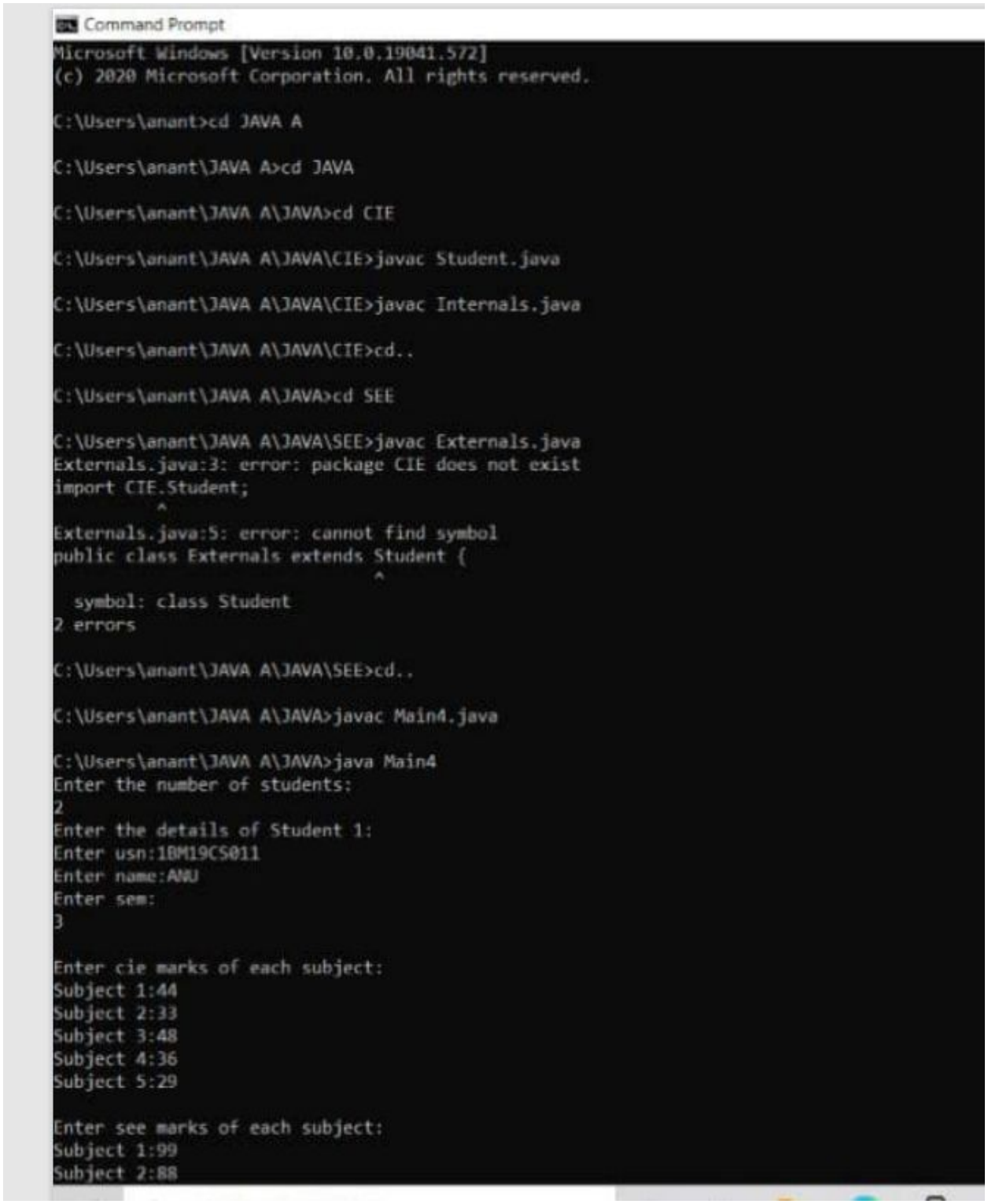

C:\Users\anant\JAVA A\JAVA\Main4.java - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
Main4.java
import CIE.*;
import SEE.*;
import java.util.Scanner;
public class Main4 {
public static void main(String[] args) {
Scanner s = new Scanner(System.in);
System.out.println("Enter the number of students:");
int n = s.nextInt();
Externals [] e = new Externals[n];
Internals [] i = new Internals[n];
for(int k=0;k<n;k++)
{
System.out.println("Enter the details of Student "+(k+1)+":");
System.out.print("Enter usn:");
String usn = s.next();
System.out.print("Enter name:");
String name = s.next();
System.out.println("Enter sem:");
String sem = s.next();
System.out.println();
System.out.println("Enter cie marks of each subject:");
double [] cie_marks = new double[5];
for(int j=1;j<=5;j++)
{
System.out.print("Subject "+(j)+":");
cie_marks[j-1] = s.nextDouble();
}
System.out.println();
System.out.println("Enter see marks of each subject:");
double [] see_marks = new double[5];
for(int j=1;j<=5;j++)
{
Line 12, Column 43

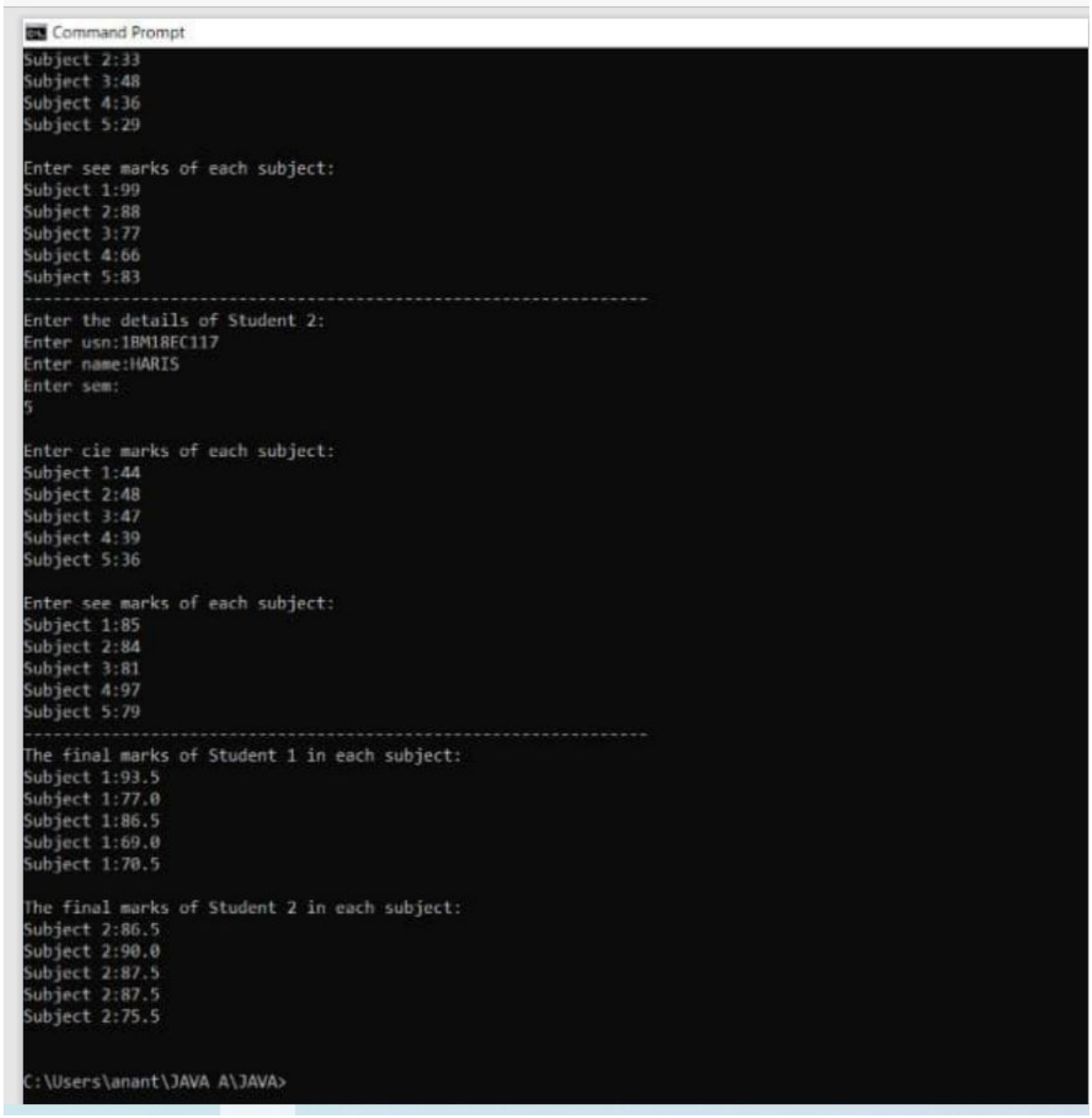

C:\Users\anant\JAVA A\JAVA\Main4.java - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
Main4.java
double [] cie_marks = new double[5];
for(int j=1;j<=5;j++)
{
System.out.print("Subject "+(j)+":");
cie_marks[j-1] = s.nextDouble();
}
System.out.println();
System.out.println("Enter see marks of each subject:");
double [] see_marks = new double[5];
for(int j=1;j<=5;j++)
{
System.out.print("Subject "+(j)+":");
see_marks[j-1] = s.nextDouble();
}
System.out.println("----------");
e[k] = new Externals(usn,name,sem,see_marks);
i[k] = new Internals(usn,name,sem,cie_marks);
}
for(int k=0;k<n;k++)
{
System.out.println("The final marks of Student "+(k+1)+" in each subject:");
for(int j=1;j<=5;j++)
{
System.out.println("Subject " + (k + 1) + ":" +(e[k].getSee_marks()[j-1]/2.0 + i[k].getMarks_cie()[j-1]));
}
System.out.println();
}
}
}


C:\Users\anant\JAVA A\JAVA\SEE\Externals.java - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
Externals.java
package SEE;
import CIE.Student;
public class Externals extends Student {
double [] see_marks = new double[5];
public Externals(String usn, String name, String sem, double[] see_marks) {
super(usn, name, sem);
this.see_marks = see_marks;
}
public double[] getSee_marks() {
return see_marks;
}
}


File Edit Selection Find View Goto Tools Project Preferences Help
Internals.java
package CIE;
public class Internals extends Student {
double [] marks_cie = new double[5];
public Internals(String usn, String name, String sem, double[] marks_cie) {
super(usn,name,sem);
this.marks_cie = marks_cie;
}
public double[] getMarks_cie() {
return marks_cie;
}
}
Line 1, Column 1


C:\Users\anant\JAVA A\JAVA\CIE\Student.java - Sublime Text (UNREGISTERED)
File Edit Selection Find View Goto Tools Project Preferences Help
Student.java
package CIE;
public class Student {
String usn;
String name;
String sem;
public Student(String usn, String name, String sem) {
this.usn = usn;
this.name = name;
this.sem = sem;
}
}


Command Prompt
Microsoft Windows [Version 10.0.19041.572]
(c) 2020 Microsoft Corporation. All rights reserved.
C:\Users\anant>cd JAVA A
C:\Users\anant\JAVA A>cd JAVA
C:\Users\anant\JAVA A\JAVA>cd CIE
C:\Users\anant\JAVA A\JAVA\CIE>javac Student.java
C:\Users\anant\JAVA A\JAVA\CIE>javac Internals.java
C:\Users\anant\JAVA A\JAVA\CIE>cd..
C:\Users\anant\JAVA A\JAVA>cd SEE
C:\Users\anant\JAVA A\JAVA\SEE>javac Externals.java
Externals.java:3: error: package CIE does not exist
import CIE.Student;
^
Externals.java:5: error: cannot find symbol
public class Externals extends Student {
^
symbol: class Student
2 errors
C:\Users\anant\JAVA A\JAVA\SEE>cd..
C:\Users\anant\JAVA A\JAVA>javac Main4.java
C:\Users\anant\JAVA A\JAVA>java Main4
Enter the number of students:
2
Enter the details of Student 1:
Enter usn:1BM19CS011
Enter name:ANU
Enter sem:
3
Enter cie marks of each subject:
Subject 1:44
Subject 2:33
Subject 3:48
Subject 4:36
Subject 5:29
Enter see marks of each subject:
Subject 1:99
Subject 2:88


Command Prompt
Subject 2:33
Subject 3:48
Subject 4:36
Subject 5:29
Enter see marks of each subject:
Subject 1:99
Subject 2:88
Subject 3:77
Subject 4:66
Subject 5:83
Enter the details of Student 2:
Enter usn:1BM18EC117
Enter name:HARIS
Enter sem:
5
Enter cie marks of each subject:
Subject 1:44
Subject 2:48
Subject 3:47
Subject 4:39
Subject 5:36
Enter see marks of each subject:
Subject 1:85
Subject 2:84
Subject 3:81
Subject 4:97
Subject 5:79
The final marks of Student 1 in each subject:
Subject 1:93.5
Subject 1:77.0
Subject 1:86.5
Subject 1:69.0
Subject 1:70.5
The final marks of Student 2 in each subject:
Subject 2:86.5
Subject 2:90.0
Subject 2:87.5
Subject 2:87.5
Subject 2:75.5
C:\Users\anant\JAVA A\JAVA>

Packages

```
import CIE.*;
import SEE.*;
import java.util.Scanner;
public class Main4{
public static void main(String[]args){
Scanner S = new Scanner(System.in);
System.out.println("Enter the number of students:");
int n = S.nextInt();
Externals[] e = new Externals[n];
Internals[] i = new Internals[n];
for(int K=0; K<n; K++)
{
system.out.println("Enter the details of Students
"+(K+1)+":");
System.out.print("Enter usn:");
  String usn = S.next();
System.out.print("Enter name:");
  String name = S.next();
System.out.println("Enter sem:");
  String sem = S.next();
System.out.println();
System.out.println("Enter cie marks of each subject:");
double[] cie-marks = new double[5];
for(int j=1; j<=5; j++)
{
  System.out.print("Subject"+(j)+":");
    cie-marks[j-1] = S.nextDouble();
}
System.out.println("-----------");
e[K] = new Externals(usn, name, sem, see-marks);
i[K] = new Internals(usn, name, sem, cie-marks);
}
  for(int K=0; K<n; K++)
{
```

```
System.out.println("The final marks of student "+(k+1)+" in each subject :");
  for(int j=1; j<=5; j++)
{
System.out.println("Subject "+(k+1)+" :"+e[k].getSee_marks()[j-1]+" "
                   +i[k].getMarks_cie()[j-1]);
  }
  System.out.println();
}
}
}
```

Packages:-

1)
```
package CIE;
public class Student {
String usn;
String name;
String sem;
public Student(String usn, String name, String sem){
this.usn = usn;
this.name = name;
this.sem = sem;
}
}
```

2)
```
package CIE;
public class Internals extends Student{
double[] marks_cie = new double[5];
public Internals(String usn, String name, String sem,
double[] marks_cie){
  super(usn, name, sem);
this.marks_cie = marks_cie;
}
public double[] getMarks_cie() {
```

```
return marks - cie;
}
}

package SEE;
import CIE.Student;
public class Externals extends Student {
double[] see_marks = new double[5];
public Externals (String usn, String name, String sem,
double[] see_marks){
super (usn, name, Sem);
this.see_marks = see_marks;
}
public double[] getSee_marks (){
return see_marks;
}
}
```

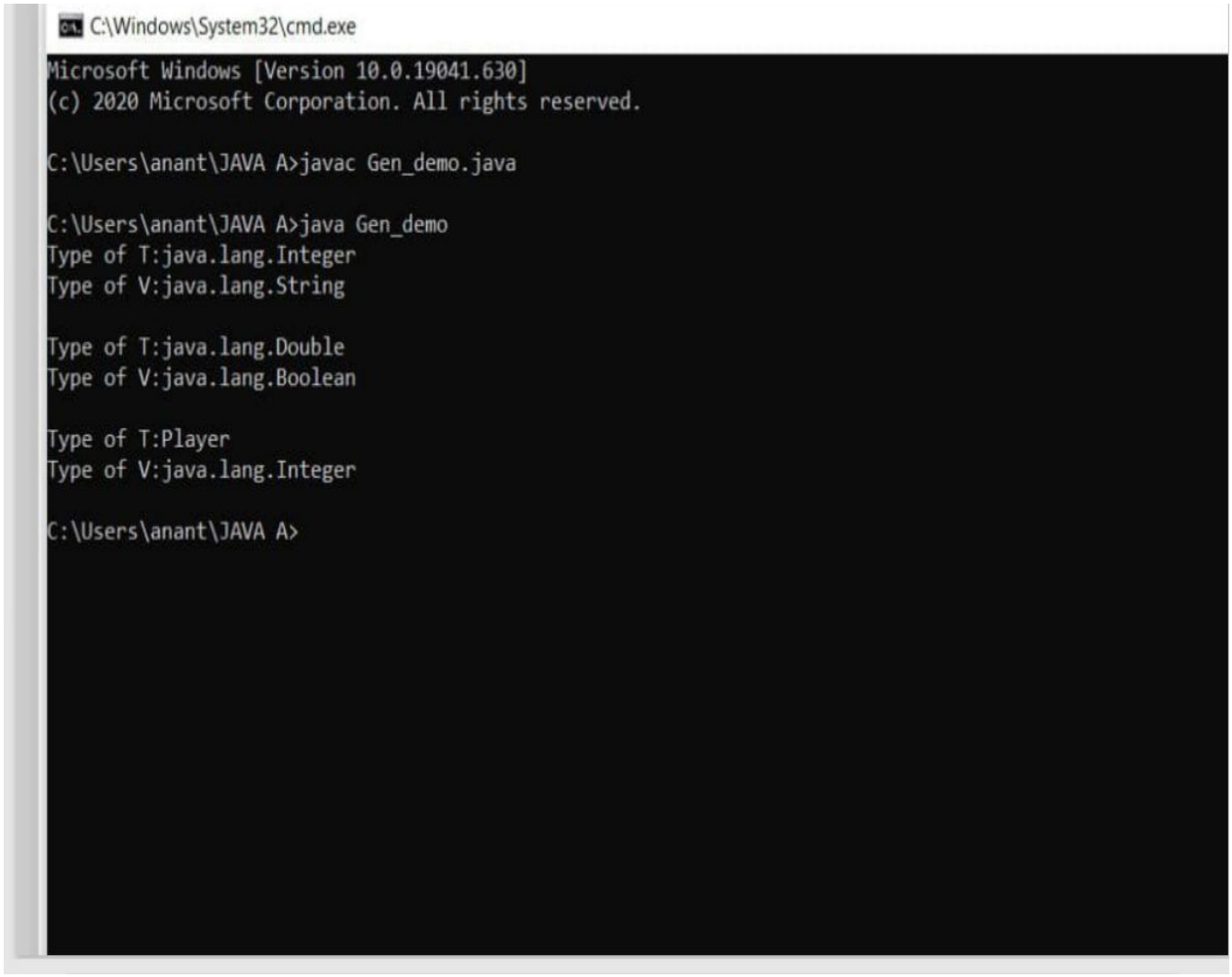
Labprogram 7

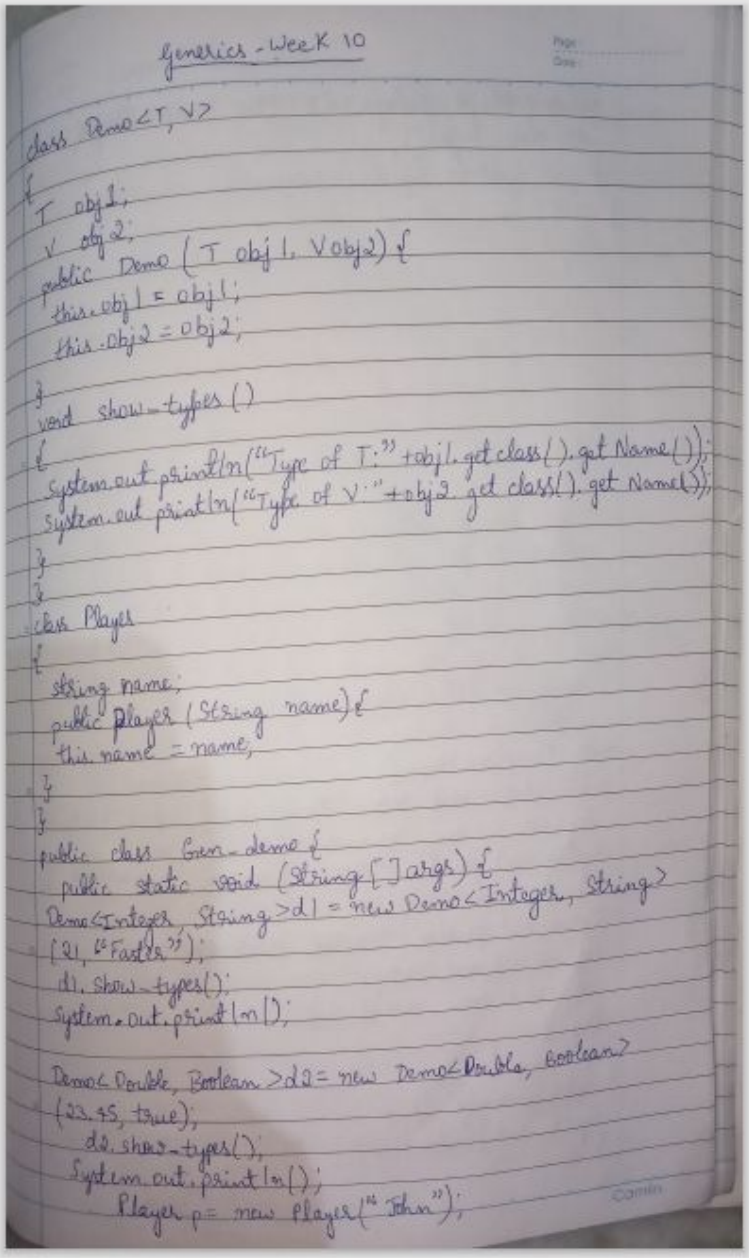
Write a program to demonstrate generics with multiple object parameters.

Gen_demo.java - Notepad

File Edit Format View Help

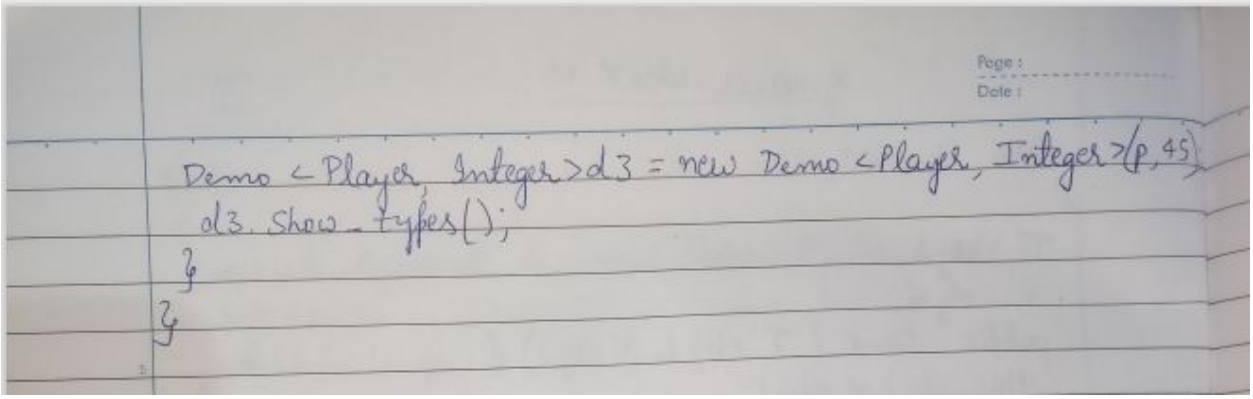
```
class Demo<T, V>
{
    T obj1;
    V obj2;

    public Demo(T obj1, V obj2) {
        this.obj1 = obj1;
        this.obj2 = obj2;
    }

    void show_types()
    {
        System.out.println("Type of T:"+obj1.getClass().getName());
        System.out.println("Type of V:"+obj2.getClass().getName());
    }
}

class Player
{
    String name;

    public Player(String name) {
        this.name = name;
    }
}
public class Gen_demo {

    public static void main(String[] args) {
            Demo<Integer, String> d1 = new Demo<Integer, String>(21, "Faster");
            d1.show_types();
        System.out.println();

            Demo<Double, Boolean> d2 = new Demo<Double, Boolean>(23.45, true);
            d2.show_types();
        System.out.println();

            Player p = new Player("John");

        Demo<Player, Integer> d3 = new Demo<Player, Integer>(p, 45);
        d3.show_types();
    }
}
```


C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19041.630]
(c) 2020 Microsoft Corporation. All rights reserved.
C:\Users\anant\JAVA A>javac Gen_demo.java
C:\Users\anant\JAVA A>java Gen_demo
Type of T:java.lang.Integer
Type of V:java.lang.String
Type of T:java.lang.Double
Type of V:java.lang.Boolean
Type of T:Player
Type of V:java.lang.Integer
C:\Users\anant\JAVA A>



generics - Week 10

```
class Demo<T, V>
{
T obj1;
V obj2;
public Demo (T obj1, V obj2) {
this.obj1 = obj1;
this.obj2 = obj2;
}
void show_types()
{
System.out.println("Type of T:" +obj1.getclass().getName());
System.out.println("Type of V:" +obj2.getclass().getName());
}
}
class Player
{
String name;
public Player (String name){
this.name = name;
}
}
public class Gen_demo {
  public static void (String[] args) {
Demo<Integer, String>d1 = new Demo<Integer, String>
(21, "Faster");
d1.show_types();
System.out.println();

Demo<Double, Boolean>d2 = new Demo<Double, Boolean>
(23.45, true);
   d2.show_types();
System.out.println();
     Player p= new Player("John");
```



```
Demo <Player, Integer>d3 = new Demo <Player, Integer>(p, 45);
 d3.show_types();
}
}
```

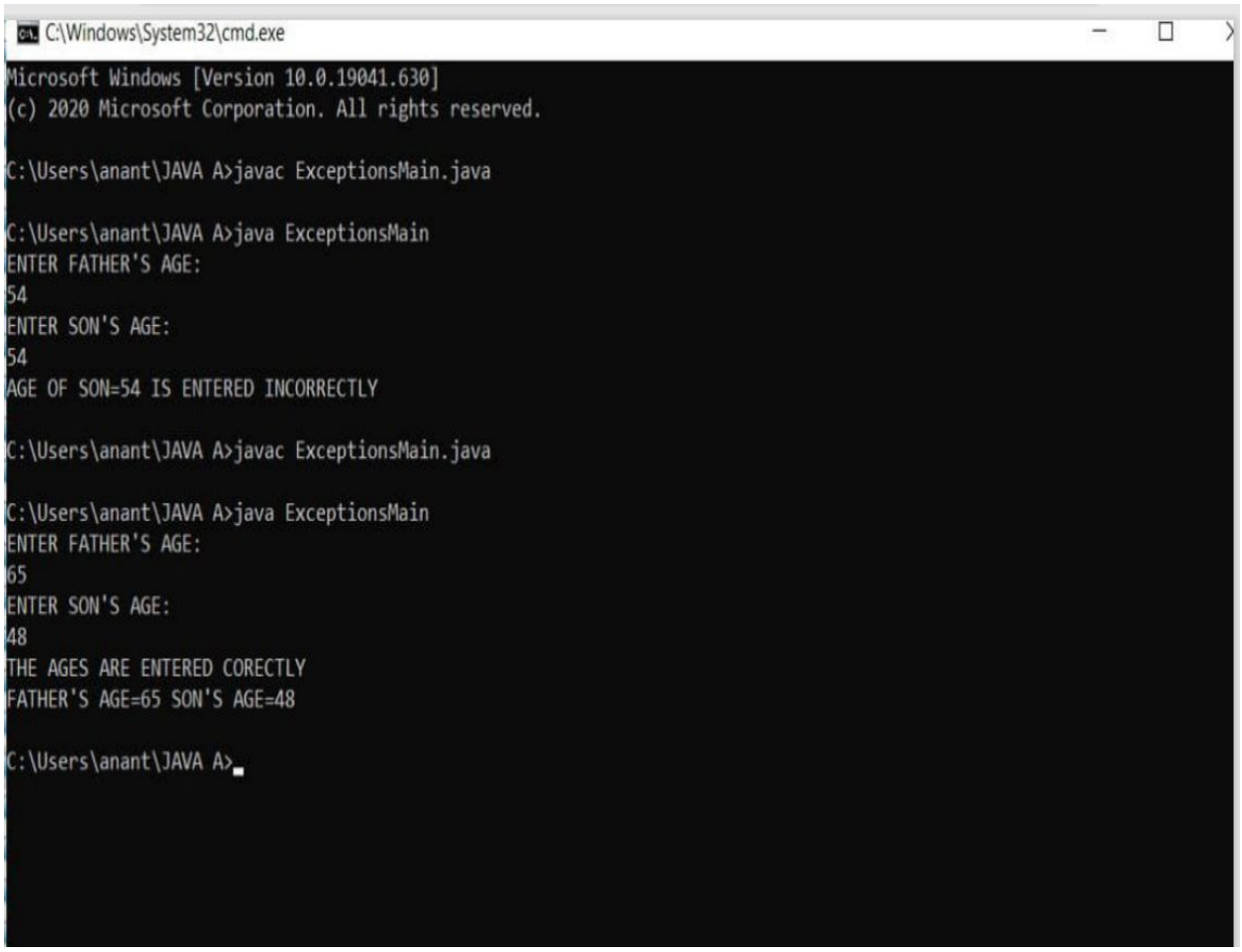
Lab Program 8

Write a program that demonstrates handling of exceptions in the inheritance tree. Create a base class called “Father” and derived class called “Son” which extends the base class. In Father class, implement a constructor which takes the age and throws the exception Wrong Age( ) when the input age=father’s age.

```
import java.util.Scanner;

class WrongAge extends Exception {
    int age;

    WrongAge(int x) {
        age = x;
    }

    public String toString() {
        return "AGE OF SON=" + age + " IS ENTERED INCORRECTLY";
    }
}

class father {
    int a;

    father(int x) {
        a = x;
    }
}

class son extends father {
    int age;

    son(int fage, int sage) {
        super(fage);
        age = sage;
    }

    void compute() throws WrongAge {
        if (age >= a) {
            throw new WrongAge(age);
        } else {
            System.out.println("THE AGES ARE ENTERED CORECTLY");
            System.out.println("FATHER'S AGE=" + a + "\t" + "SON'S AGE=" + age);
        }
    }

}

class ExceptionsMain {
```

File Edit Format View Help

```
class father {
    int a;

    father(int x) {
        a = x;
    }
}

class son extends father {
    int age;

    son(int fage, int sage) {
        super(fage);
        age = sage;
    }

    void compute() throws WrongAge {
        if (age >= a) {
            throw new WrongAge(age);
        } else {
            System.out.println("THE AGES ARE ENTERED CORECTLY");
            System.out.println("FATHER'S AGE=" + a + "\t" + "SON'S AGE=" + age);
        }
    }

}

class ExceptionsMain {
    public static void main(String args[]) {
        Scanner s = new Scanner(System.in);
        System.out.println("ENTER FATHER'S AGE:");
        int f = s.nextInt();
        System.out.println("ENTER SON'S AGE:");
        int so = s.nextInt();
        son ss = new son(f, so);
        try {
            ss.compute();
        } catch (WrongAge e) {
            System.out.println(e);
        }
    }
}
```


C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.19041.630]
(c) 2020 Microsoft Corporation. All rights reserved.
C:\Users\anant\JAVA A>javac ExceptionsMain.java
C:\Users\anant\JAVA A>java ExceptionsMain
ENTER FATHER'S AGE:
54
ENTER SON'S AGE:
54
AGE OF SON=54 IS ENTERED INCORRECTLY
C:\Users\anant\JAVA A>javac ExceptionsMain.java
C:\Users\anant\JAVA A>java ExceptionsMain
ENTER FATHER'S AGE:
65
ENTER SON'S AGE:
48
THE AGES ARE ENTERED CORECTLY
FATHER'S AGE=65 SON'S AGE=48
C:\Users\anant\JAVA A>

Week 10 - Lab Program 2

```
import java.util.Scanner;
class WrongAge extends Exception{
  int age;
WrongAge(int x) {
   age=x;
}
public String toString() {
 return "AGE OF SON =" + age + "IS ENTERED INCORRECTLY";
 }
}
class father {
 int a;
father(int x) {
 a=x;
 }
}
class son extends father {
int age;
Son(int fage, int sage){
super(fage);
age = sage;
}
void compute() throws WrongAge{
if (age>=a) {
throw new WrongAge(age);
} else {
System.out.println("The AGES are entered CORECTLY");
System.out.println("FATHER'S AGE =" +a+ "\t" +
"SON'S AGE =" + age);
 }
}
}
```

Father - Son Exception

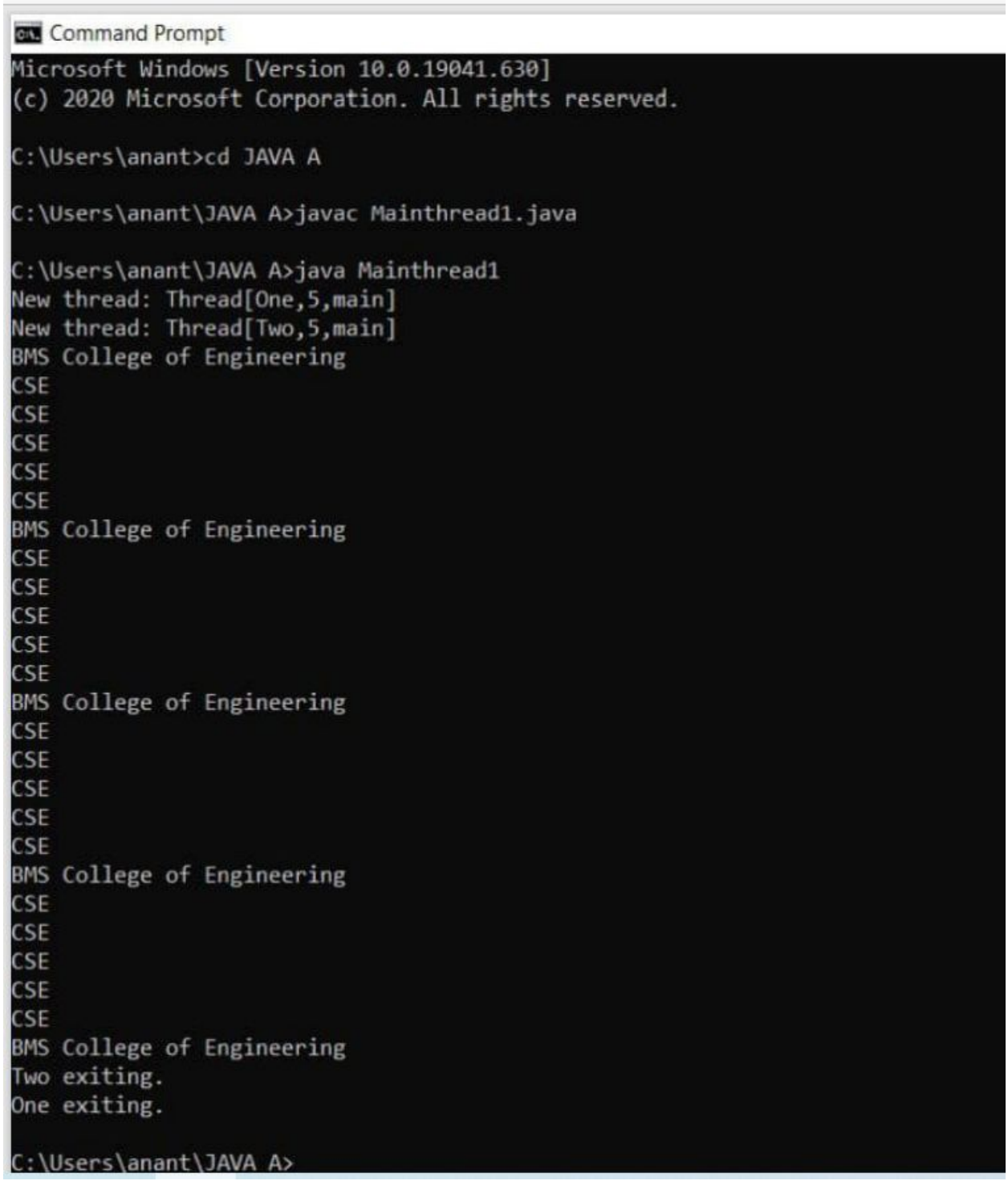
```
class ExceptionsMain{
public static void main(String args[]){
  Scanner S = new Scanner(System.in);
System.out.println("ENTER FATHER'S AGE:");
int f = S.nextInt();
System.out.println("ENTER SON'S AGE:");
int SO = S.next Int();
Son SS = new Son(f, So);
try {
SS. compute();
} catch(wrongAge e) {
  System.out.println(e);
} }
}
```

LAB PROGRAM: 9

Write a program which creates two threads, one thread displaying “BMS College of Engineering” once every ten seconds and another displaying “CSE” once every two seconds.

File Edit Format View Help

```
class NewThread implements Runnable {
    String name;
    Thread t;
    NewThread(String threadName) {
        name = threadName;
        t = new Thread(this, name);
        System.out.println("New thread: " + t);
        t.start();
    }

    public void run() {
        try {
            if (t.getName().equals("One")) {
                for (int i = 5; i > 0; i--) {
                    System.out.println("BMS College of Engineering");
                    Thread.sleep(10000);
                }
            }
            else{
                for (int i = 20; i > 0; i--) {
                    System.out.println("CSE");
                    Thread.sleep(2000);
            }
            }
        }
        catch(InterruptedException e){
            System.out.println(name + "Interrupted");
        }
        System.out.println(name + " exiting.");
    }
}

public class Mainthread1 {

    public static void main(String[] args) {
        new NewThread("One");
        new NewThread("Two");
    }
}
```

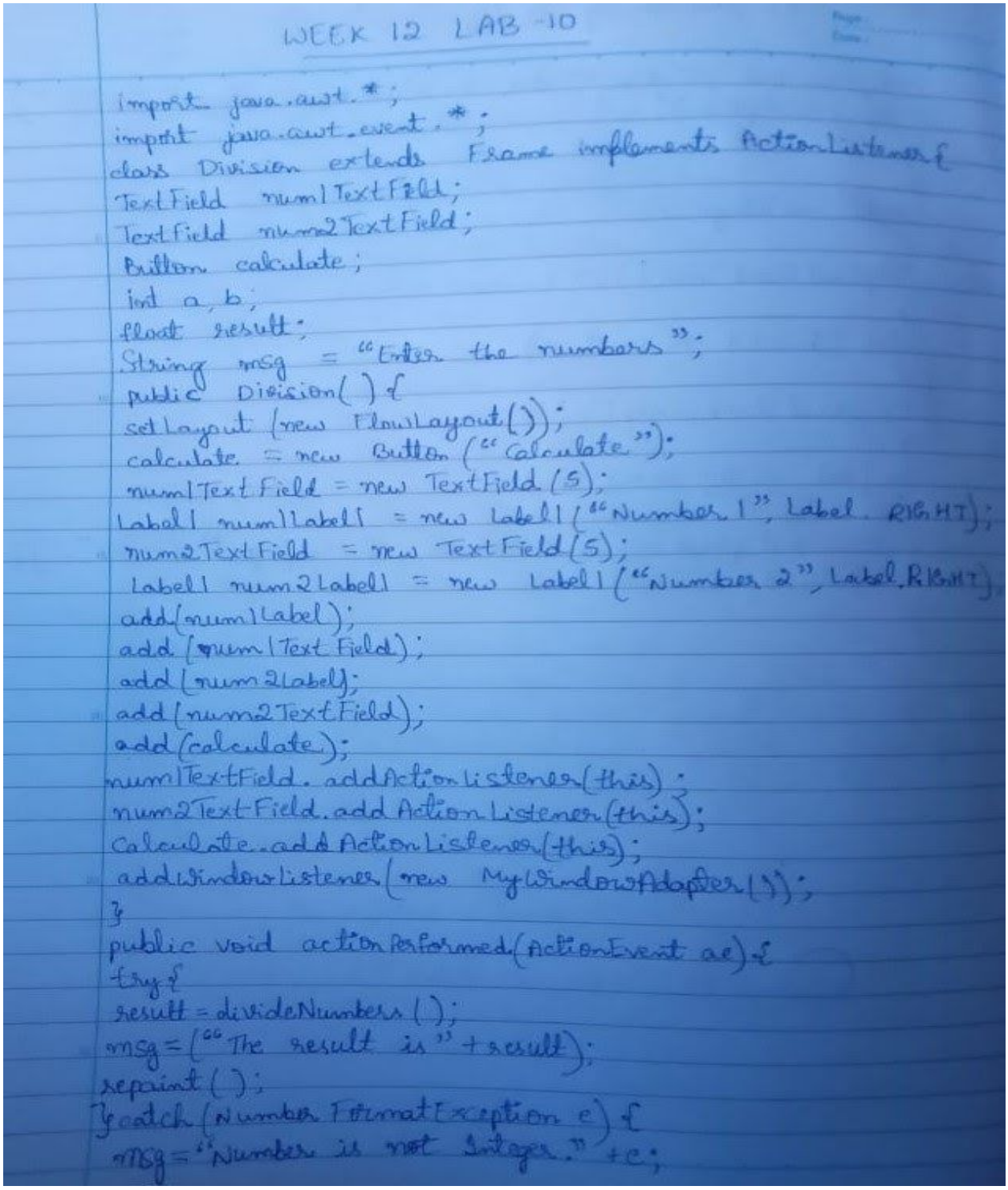

Command Prompt
Microsoft Windows [Version 10.0.19041.630]
(c) 2020 Microsoft Corporation. All rights reserved.
C:\Users\anant>cd JAVA A
C:\Users\anant\JAVA A>javac Mainthread1.java
C:\Users\anant\JAVA A>java Mainthread1
New thread: Thread[One,5,main]
New thread: Thread[Two,5,main]
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
Two exiting.
One exiting.
C:\Users\anant\JAVA A>

WEEK 11 OOJ PROGRAM

```
class NewThread implements Runnable {
String name;
Thread t;
NewThread(String threadName) {
name = threadName;
t = new Thread(this, name);
System.out.println("New thread:" + t);
t.start();
}
public void run() {
try {
if(t.getName().equals("One")) {
for (int i= 5; i>0; i--) {
System.out.println("BMS COLLEGE of Engineering");
Thread.sleep(10000);
}
}
else {
for (int i= 20; i>0; i--){
    System.out.println("CSE");
 Thread.sleep(2000);
}
}
}
catch (InterruptedException e) {
 System.out.println(name + "Interrupted");
}
System.out.println(name + "exiting.");
}}
public class Mainthread1 {
public static void main(String[] args) {
new NewThread("One");
new NewThread("Two");
}
```

Lab program 10

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.



WEEK 12 LAB -10

```
import java.awt.*;
import java.awt.event.*;
class Division extends Frame implements ActionListener{
TextField num1TextField;
TextField num2TextField;
Button calculate;
int a, b;
float result;
String msg = "Enter the numbers";
public Division(){
setLayout(new FlowLayout());
calculate = new Button("Calculate");
num1TextField = new TextField(5);
Label1 num1Label1 = new Label1("Number 1", Label.RIGHT);
num2TextField = new TextField(5);
Label1 num2Label1 = new Label1("Number 2", Label.RIGHT);
add(num1Label);
add(num1TextField);
add(num2Label);
add(num2TextField);
add(calculate);
num1TextField.addActionListener(this);
num2TextField.addActionListener(this);
Calculate.addActionListener(this);
addWindowListener(new MyWindowAdapter());
}
public void actionPerformed(ActionEvent ae){
try{
result = divideNumbers();
msg=("The result is" +result);
repaint();
}catch(NumberFormatException e){
msg="Number is not Integer." +e;
```

```
repaint();
}catch(ArithmaticException e){
msg="Divide By Zero not Allowed."+e;
repaint()
}
}
public float divideNumbers(){
a=Integer.parseInt(num1TextField.getText());
b=Integer.parseInt(num2TextField.getText());
if(b==0){
throw new ArithmeticException();
}
return (float) a/b;
}
public void paint(Graphics g){
g.drawString(msg,50,100);
}
public static void main(String args[]){
Division div=new Division();
div.setSize(new Dimension(500,500));
div.setTitle("Division Calculator");
div.setVisible(true);
}
}
class MyWindowAdapter extends WindowAdapter{
public void windowClosing(WindowEvent event){
System.exit(0);
}
}
```

Division.java - Notepad

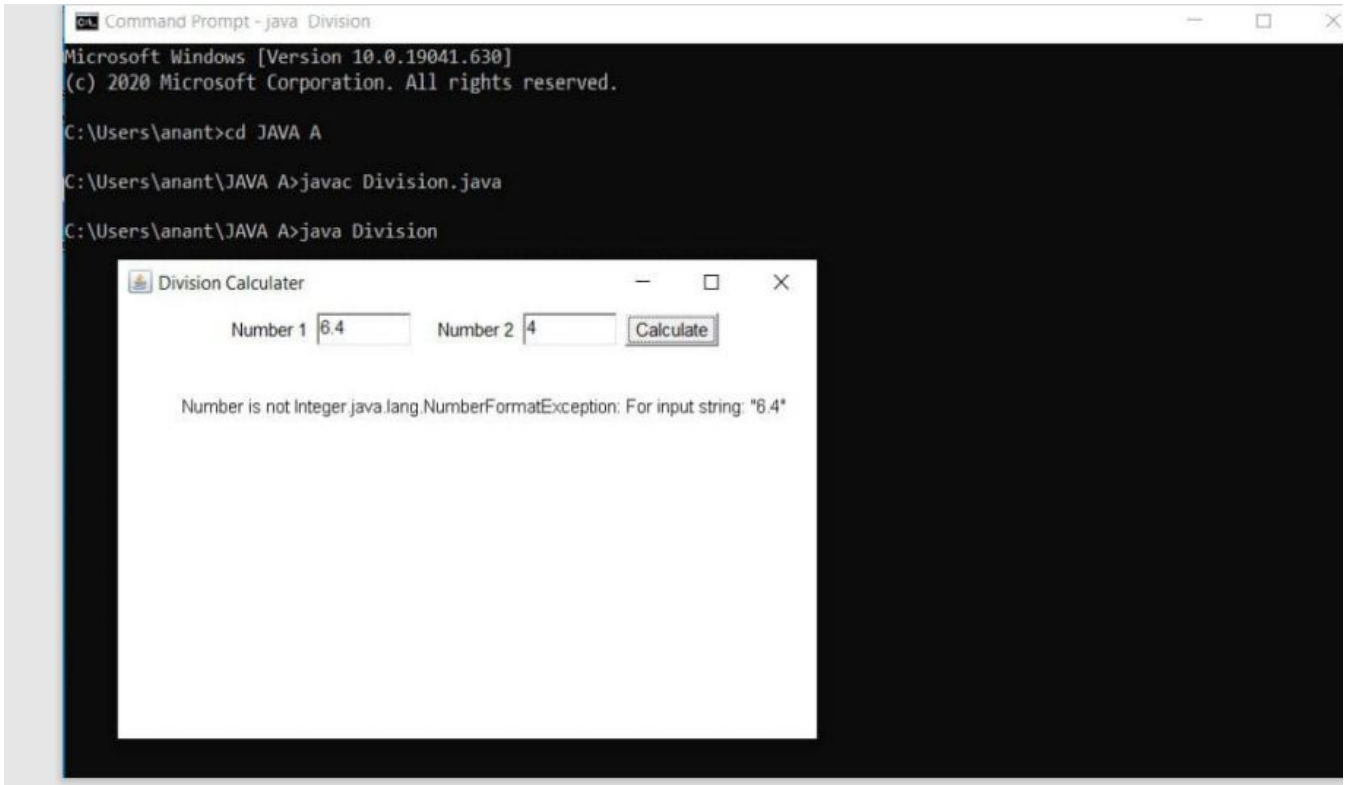
File Edit Format View Help

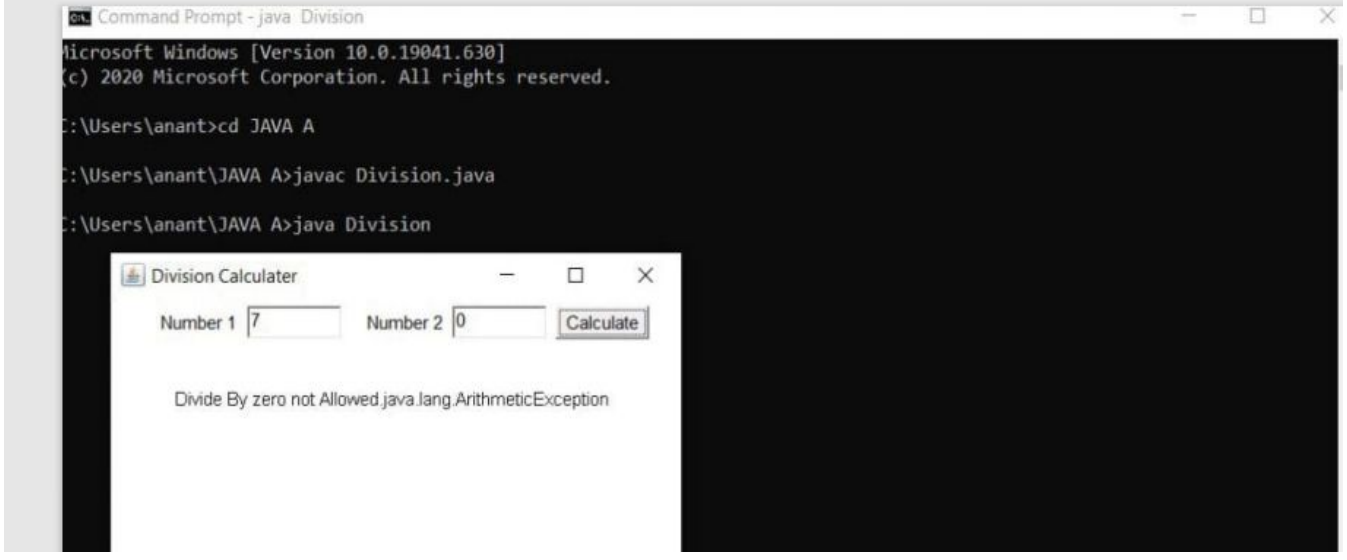
```
import java.awt.*;
import java.awt.event.*;
class Division extends Frame implements ActionListener{
    TextField num1TextField;
    TextField num2TextField;
    Button calculate;
    int a,b;
    float result;
    String msg="Enter the numbers";
    public Division(){

        setLayout(new FlowLayout());

        calculate=new Button("Calculate");
        num1TextField=new TextField(5);
        Label num1Label=new Label("Number 1",Label.RIGHT);
        num2TextField=new TextField(5);
        Label num2Label=new Label("Number 2",Label.RIGHT);

        add(num1Label);
        add(num1TextField);
        add(num2Label);
        add(num2TextField);
        add(calculate);
        num1TextField.addActionListener(this);
        num2TextField.addActionListener(this);
        calculate.addActionListener(this);

        addWindowListener(new MyWindowAdapter());
    }
    public void actionPerformed(ActionEvent ae){
        try{
            result=divideNumbers();
            msg=("The result is "+result);
            repaint();
        }catch(NumberFormatException e){
            msg="Number is not Integer."+e;
            repaint();
        }catch(ArithmeticException e){
            msg="Divide By zero not Allowed."+e;
```

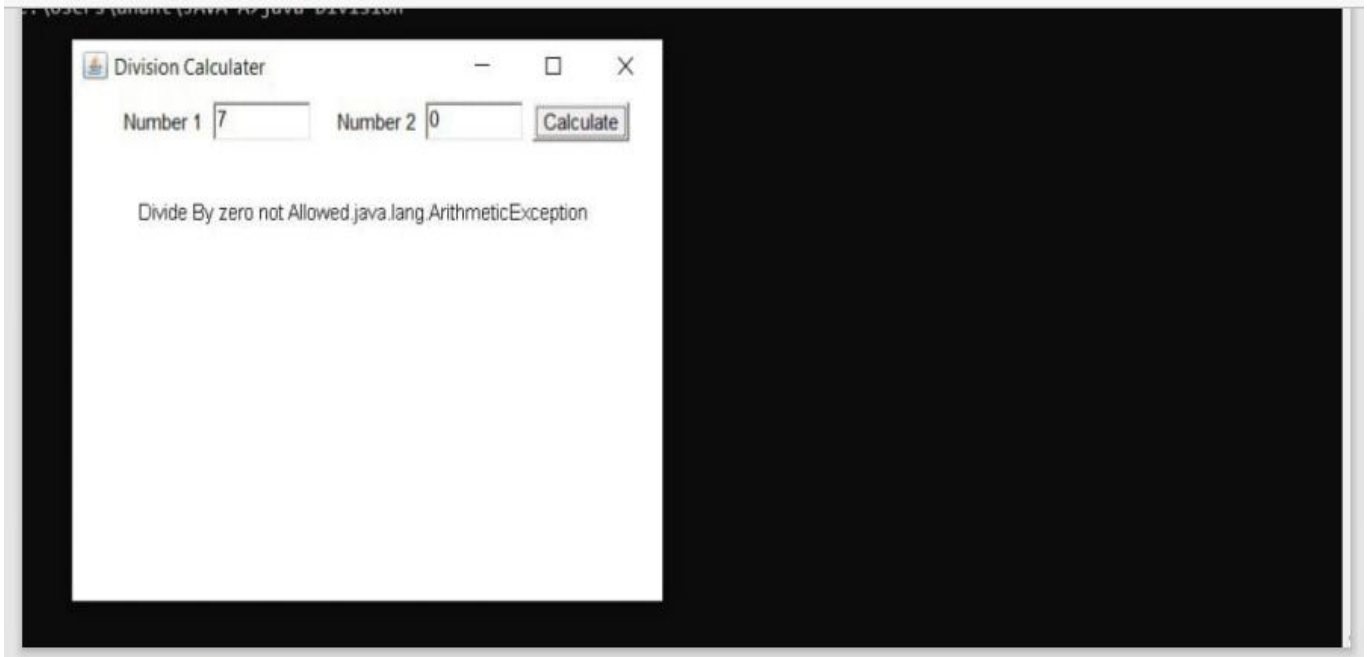
Division.java - Notepad

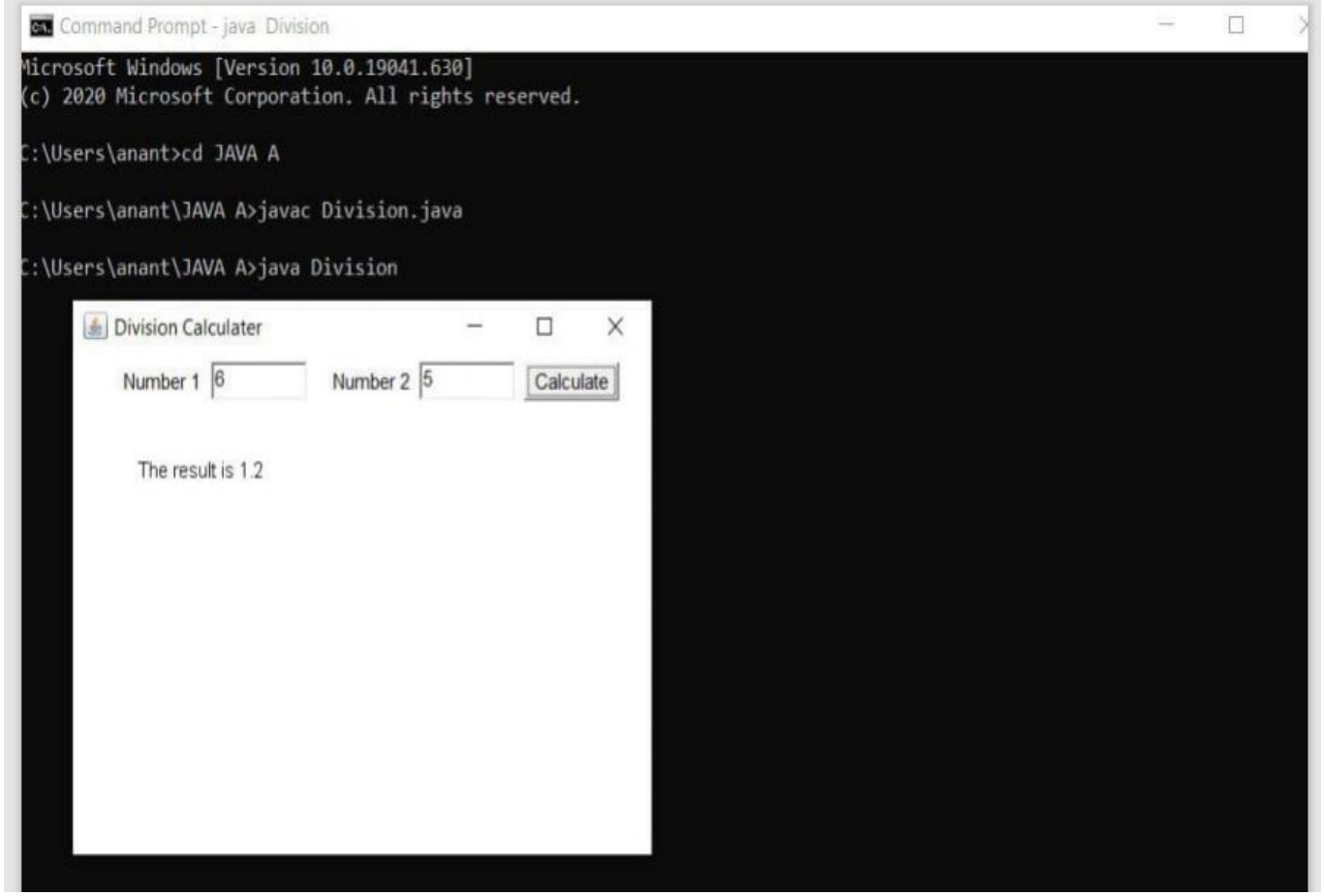
File Edit Format View Help

```
        calculate.addActionListener(this);

        addWindowListener(new MyWindowAdapter());
    }
    public void actionPerformed(ActionEvent ae){
        try{
            result=divideNumbers();
            msg=("The result is "+result);
            repaint();
        }catch(NumberFormatException e){
            msg="Number is not Integer."+e;
            repaint();
        }catch(ArithmeticException e){
            msg="Divide By zero not Allowed."+e;
            repaint();
        }
    }
    public float divideNumbers(){
        a=Integer.parseInt(num1TextField.getText());
        b=Integer.parseInt(num2TextField.getText());
        if(b==0){
            throw new ArithmeticException();
        }
        return (float)a/b;
    }
    public void paint(Graphics g){
        g.drawString(msg,50,100);
    }
    public static void main(String args[]){
        Division div=new Division();
        div.setSize(new Dimension(500,500));
        div.setTitle("Division Calculater");
        div.setVisible(true);
    }
}
class MyWindowAdapter extends WindowAdapter{
    public void windowClosing(WindowEvent event){
        System.exit(0);
    }
}
```


Command Prompt - java Division
Microsoft Windows [Version 10.0.19041.630]
(c) 2020 Microsoft Corporation. All rights reserved.
C:\Users\anant>cd JAVA A
C:\Users\anant\JAVA A>javac Division.java
C:\Users\anant\JAVA A>java Division
Division Calculater
Number 1 6.4
Number 2 4
Calculate
Number is not Integer.java.lang.NumberFormatException: For input string: "6.4"


Command Prompt - java Division
Division Calculater
Number 1 7
Number 2 0
Calculate
Divide By zero not Allowed.java.lang.ArithmeticException


Division Calculater
Number 1 7
Number 2 0
Calculate
Divide By zero not Allowed java.lang.ArithmeticException


Command Prompt - java Division
Microsoft Windows [Version 10.0.19041.630]
(c) 2020 Microsoft Corporation. All rights reserved.
C:\Users\anant>cd JAVA A
C:\Users\anant\JAVA A>javac Division.java
C:\Users\anant\JAVA A>java Division
Division Calculater
Number 1 6
Number 2 5
Calculate
The result is 1.2

Lab Program 10

Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

DivInt.java - Notepad

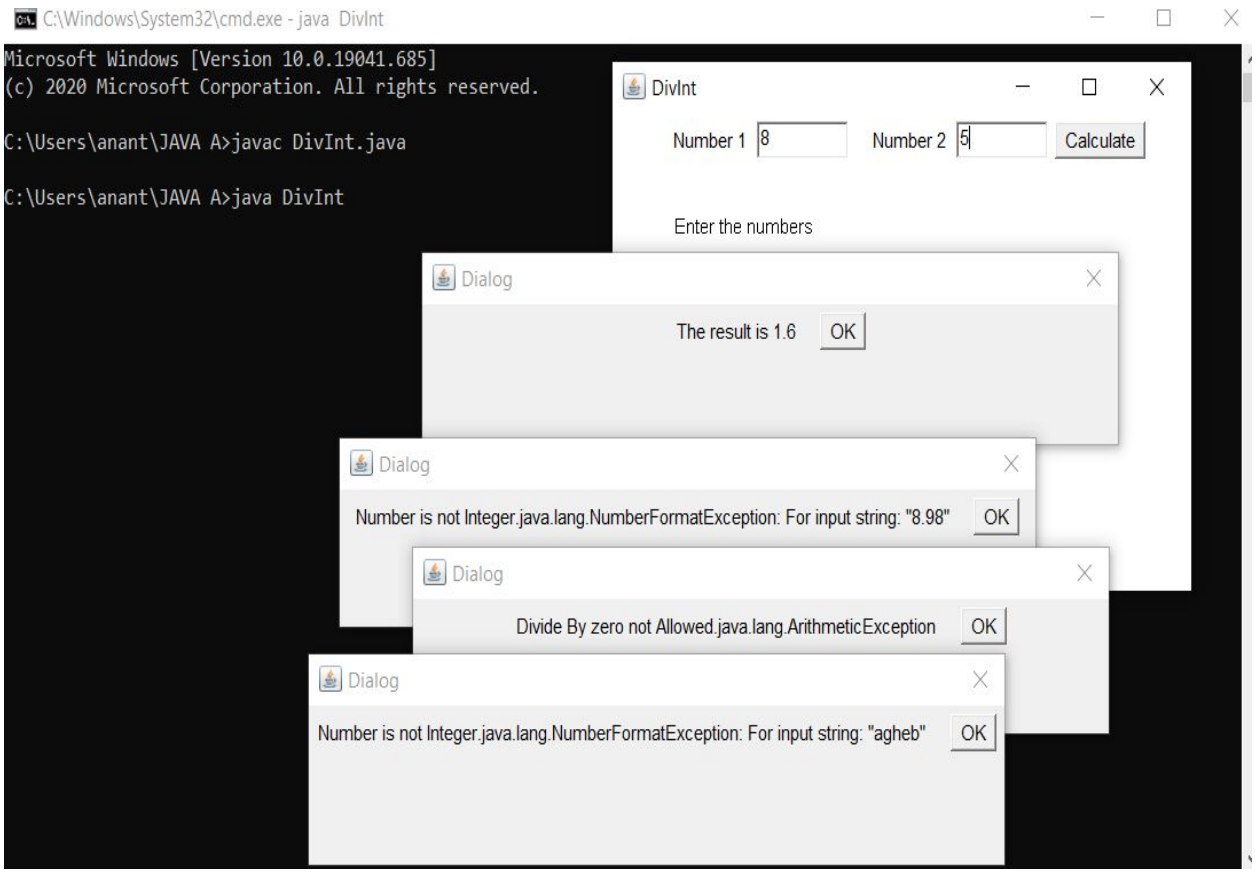
File Edit Format View Help

```
import java.awt.event.*;
import java.awt.*;


class SampleDialog extends Dialog implements ActionListener {
        DivInt bld;
        SampleDialog(Frame parent, String title) {
                super(parent, title, false);
                bld=(DivInt)parent;
                setLayout(new FlowLayout());
                setSize(500, 200);
                add(new Label(bld.msg));
                Button b;
                add(b = new Button("OK"));
                b.addActionListener(this);
        }
        public void actionPerformed(ActionEvent ae) {
                dispose();
        }
}


public class DivInt extends Frame implements ActionListener {
        TextField num1TextField;
    TextField num2TextField;
    Button calculate;
    int a,b;
    float result;
    String msg="Enter the numbers";
    public DivInt(){

        setLayout(new FlowLayout());

        calculate=new Button("Calculate");
        num1TextField=new TextField(5);
        Label num1Label=new Label("Number 1",Label.RIGHT);
        num2TextField=new TextField(5);
        Label num2Label=new Label("Number 2",Label.RIGHT);

        add(num1Label);
        add(num1TextField);
        add(num2Label);
        add(num2TextField);
        add(calculate);
        num1TextField.addActionListener(this);
        num2TextField.addActionListener(this);
        calculate.addActionListener(this);

        addWindowListener(new MyWindowAdapter());
```

DivInt.java - Notepad

File Edit Format View Help

```
        num1TextField.addActionListener(this);
        num2TextField.addActionListener(this);
        calculate.addActionListener(this);

        addWindowListener(new MyWindowAdapter());
    }

 public void actionPerformed(ActionEvent ae) {
        try{
                result=divideNumbers();
                msg=("The result is "+result);
        }catch(NumberFormatException e){
                msg="Number is not Integer."+e;
        }catch(ArithmeticException e){
                msg="Divide By zero not Allowed."+e;
        }
        SampleDialog d = new
        SampleDialog(this, "Dialog");
        d.setVisible(true);
 }

    public float divideNumbers(){
        a=Integer.parseInt(num1TextField.getText());
        b=Integer.parseInt(num2TextField.getText());
        if(b==0){
            throw new ArithmeticException();
        }
        return (float)a/b;
    }

    public void paint(Graphics g){
        g.drawString(msg,50,100);
    }

    public static void main(String args[]){
        DivInt aa=new DivInt();
                aa.setSize(new Dimension(500,500));
                aa.setTitle("DivInt");
                aa.setVisible(true);
    }
}


class MyWindowAdapter extends WindowAdapter {
        public void windowClosing(WindowEvent we) {
                System.exit(0);
        }
}
```


C:\Windows\System32\cmd.exe - java DivInt
Microsoft Windows [Version 10.0.19041.685]
(c) 2020 Microsoft Corporation. All rights reserved.
C:\Users\anant\JAVA A>javac DivInt.java
C:\Users\anant\JAVA A>java DivInt
DivInt
Number 1 8
Number 2 5
Calculate
Enter the numbers
Dialog
The result is 1.6
OK
Dialog
Number is not Integer.java.lang.NumberFormatException: For input string: "8.98"
OK
Dialog
Divide By zero not Allowed.java.lang.ArithmeticException
OK
Dialog
Number is not Integer.java.lang.NumberFormatException: For input string: "agheb"
OK

Week 13

```
import java.awt.event.*;
import java.awt.*;

class SampleDialog extends Dialog implements ActionListener{
DivInt bld;
SampleDialog(Frame parent, String title){
super(parent, title, false);
bld = (DivInt) parent;
setLayout(new FlowLayout());
setSize(500,200);
add(new Label(bld.msg));
Button b;
add(b = new Button("OK"));
b.addActionListener(this);
}
public void actionPerformed(ActionEvent ae){
dispose();
}}
public class DivInt extends Frame implements ActionListener{
TextField num1TextField;
TextField num2TextField;
Button calculate;
int a,b;
float result;
String msg = "Enter the numbers";
public DivInt(){
setLayout(new FlowLayout());
calculate = new Button("Calculate");
num1TextField = new TextField(5);
Label num1Label = new Label("Number 1", Label.RIGHT);
num2TextField = new TextField(5);
Label num2Label = new Label("Number 2", Label.RIGHT);
```

```
add(num1Label);
add(num1TextField);
add(num2Label);
add(num2TextField);
add(calculate);
num1TextField.addActionListener(this);
num2TextField.addActionListener(this);
calculate.addActionListener(this);
addWindowListener(new MyWindowAdapter());
}
public void actionPerformed(ActionEvent ae){
try{
result = divideNumbers();
msg = ("The result is" +result);
} catch (NumberFormatException e){
msg = "Number is not Integer." +e;
} catch (ArithematicException e){
msg = "Divide By zero not Allowed." +e;
}
SampleDialog d = new
SampleDialog (this, "Dialog");
d.setVisible(true);
}
public float divideNumbers(){
a = Integer.parseInt(num1TextField.getText());
b = Integer.parseInt(num2TextField.getText());
```

```
if(b==0){
throw new ArithmeticException();
}
return (float)a/b;
}
public void paint(Graphics g){
g.drawString(msg, 50, 100);
}
public static void main(String args[]){
DivInt aa = new DivInt();
aa.setSize(new Dimension(500,500));
aa.setTitle("DivInt");
aa.setVisible(true);
}
}
class MyWindowAdapter extends WindowAdapter{
public void windowClosing(WindowEvent we){
System.exit(0);
}
}
```