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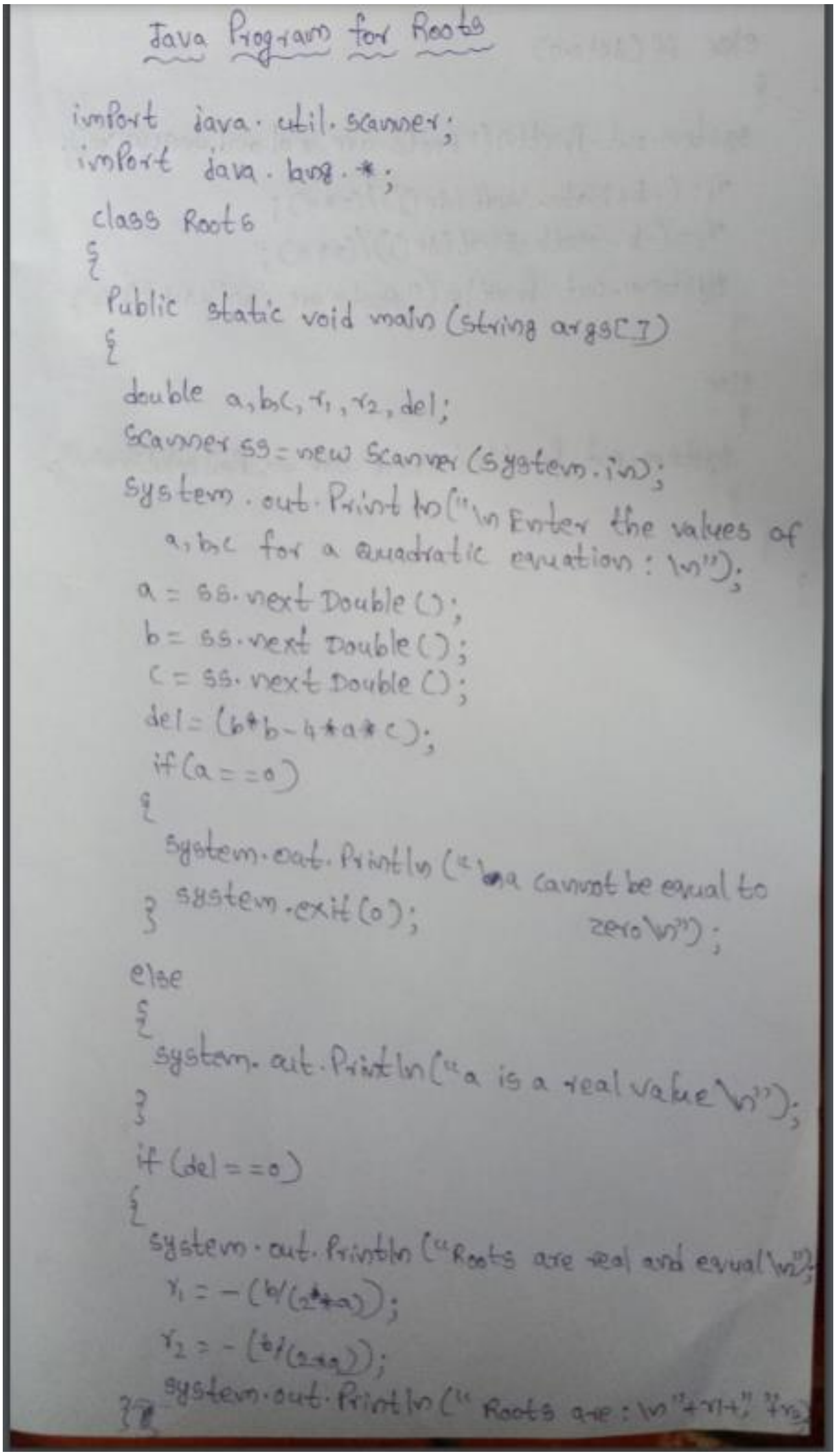
Section:3B

OOJ LAB OBSERVATION

Lab-Program-1:

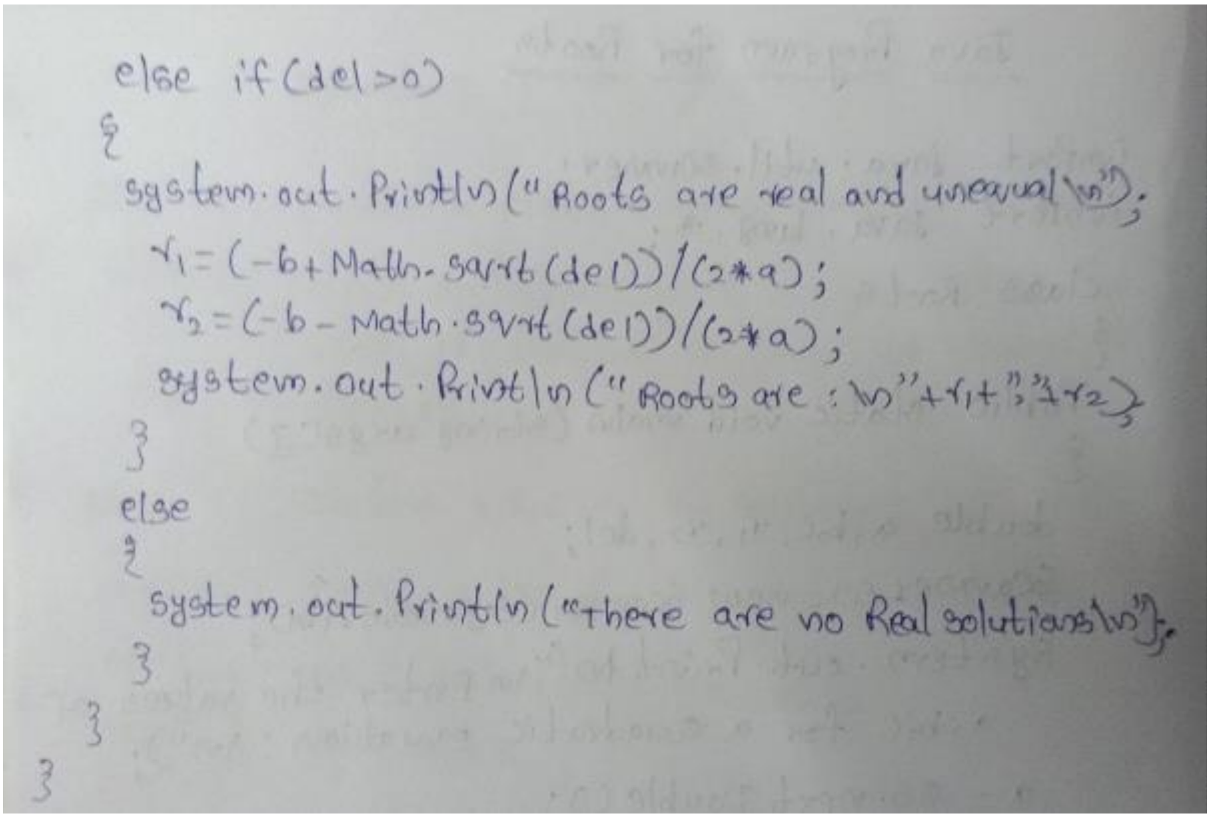
Develop a Java program that prints all real solutions to the quadratic equation ax2 +bx+c = 0

Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

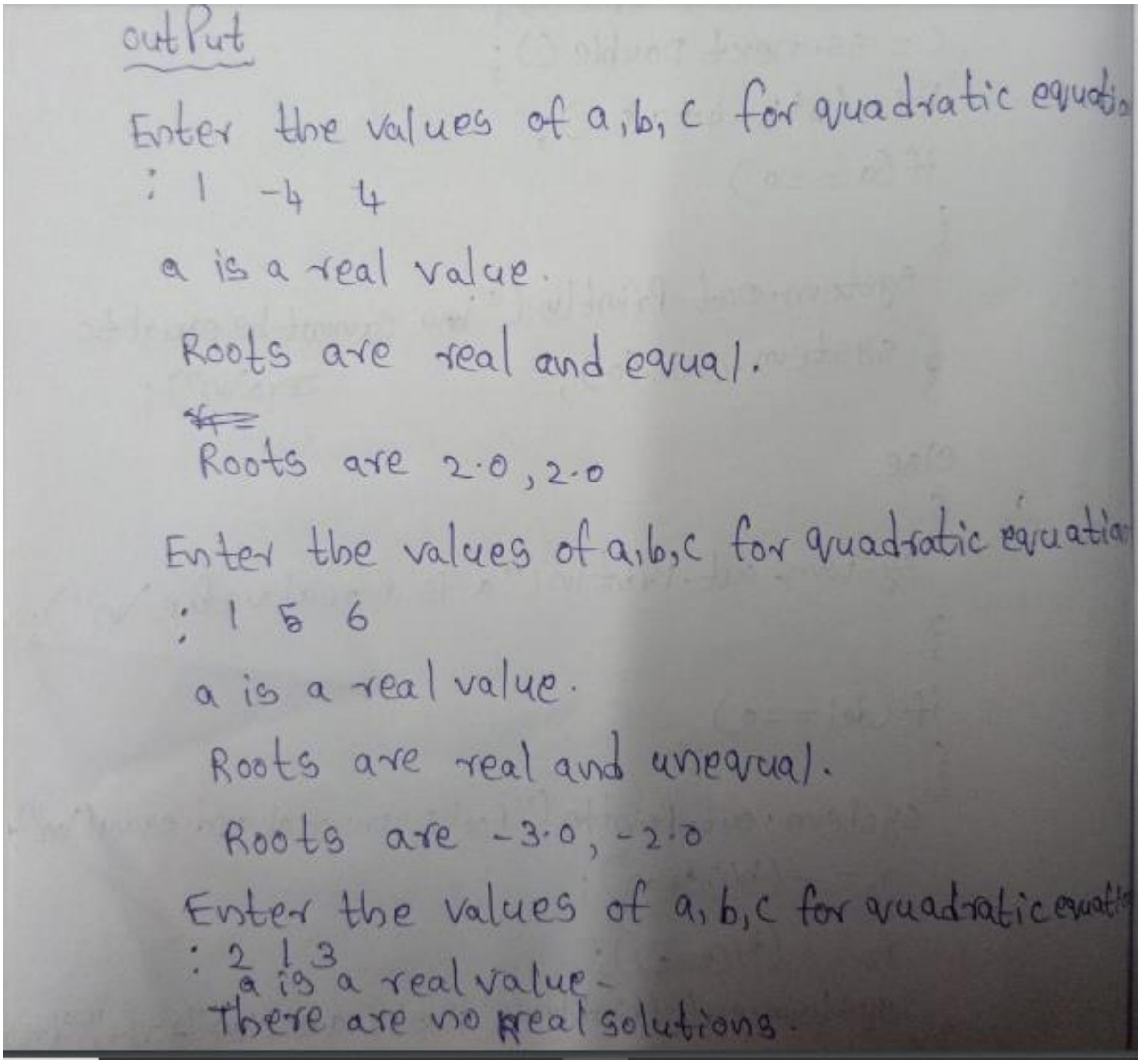


Java Program for Roots

```
import java.util.scanner;
import java.lang.*;
class Roots
{
 Public static void main (string args[])
 {
  double a,b,c,r1,r2,del;
  Scanner ss=new Scanner(system.in);
  system.out.Print ln("\n Enter the values of
     a,b,c for a quadratic equation : \n");
   a= ss.next Double ();
   b= ss.next Double();
   c= ss.next Double ();
   del=(b*b-4*a*c);
   if(a==0)
   {
    system.out.Println("\n a cannot be equal to
                                    zero\n");
    system.exit(0);
   }
  else
  {
   system.out.Println("a is a real value\n");
  }
  if(del==0)
  {
   system.out.Println("Roots are real and equal\n");
    r1=-(b/(2*a));
    r2=-(b/(2*a));
   system.out.Println(" Roots are : \n"+r1+" "+r2)
  }
```

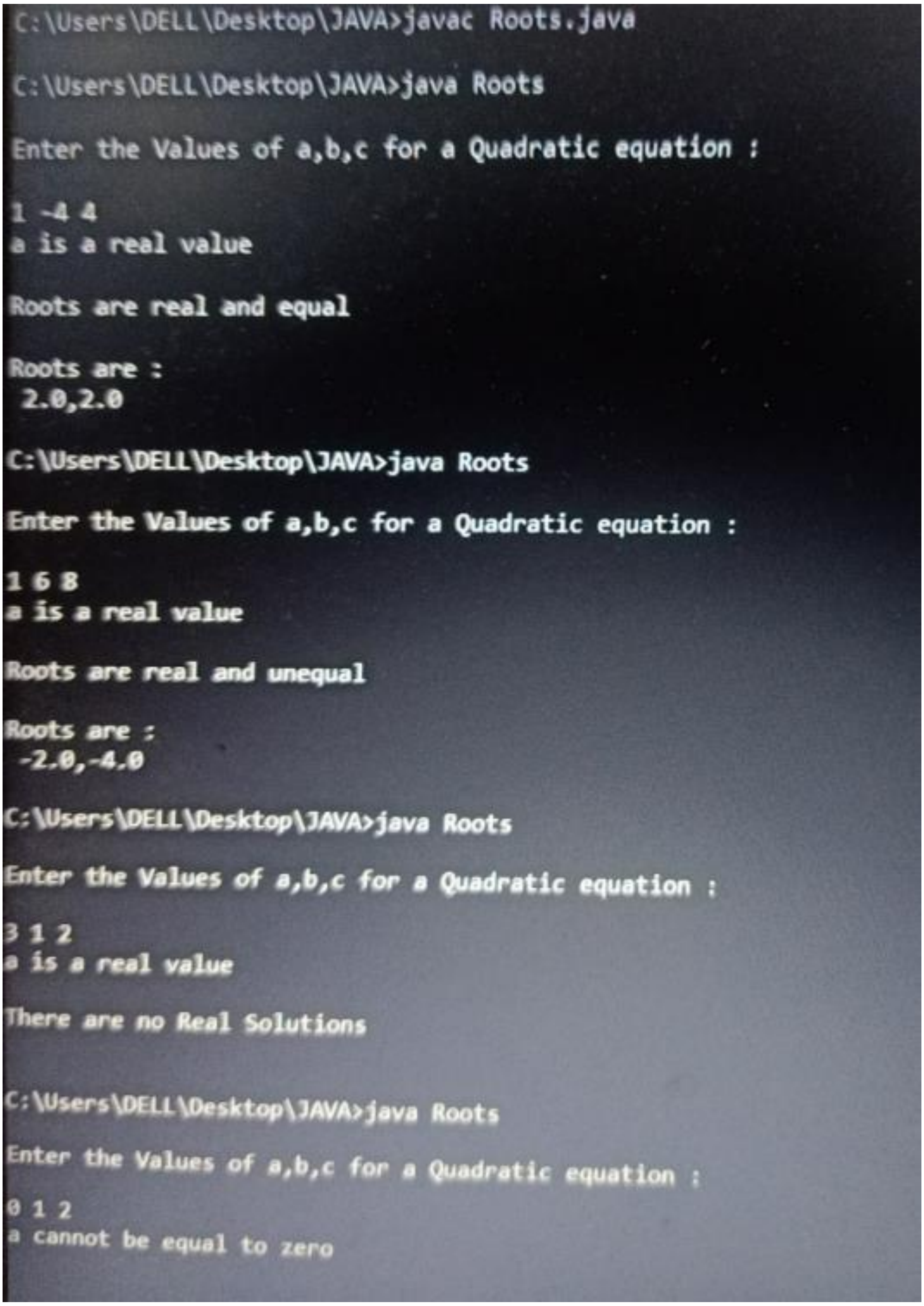


```
else if(del>0)
{
 system.out.Println("Roots are real and unequal\n");
  r1=(-b+Math.sqrt(del))/(2*a);
  r2=(-b-Math.sqrt(del))/(2*a);
  system.out.Println("Roots are :\n"+r1+","+r2);
 }
 else
 {
  system.out.Println("There are no Real solutions\n");
 }
}
}
```



outPut

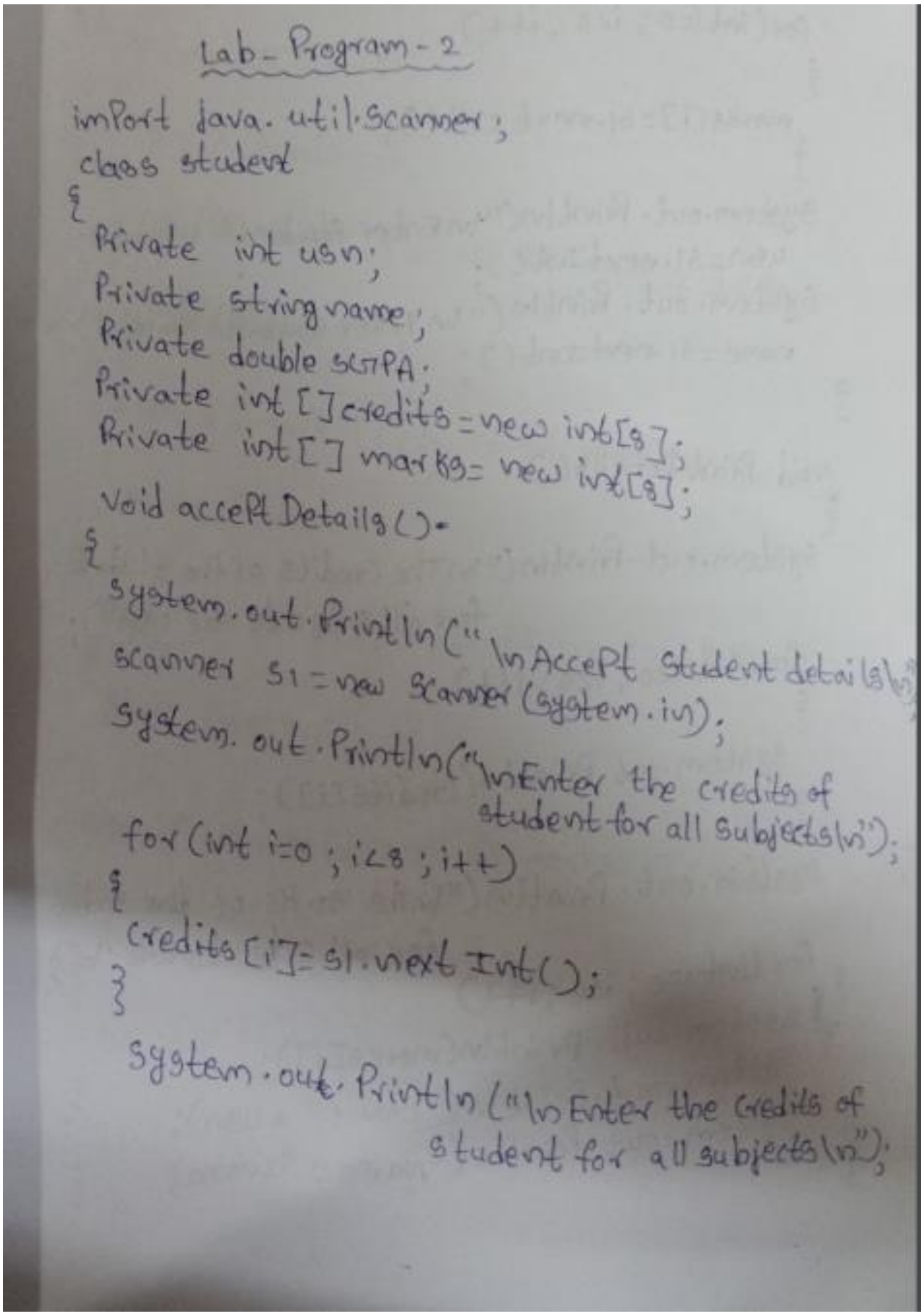
```
Enter the values of a,b,c for quadratic equatio
: 1 -4 4
 a is a real value.
  Roots are real and equal.
  Roots are 2.0,2.0
 Enter the values of a,b,c for quadratic equation
 : 1 5 6
  a is a real value.
   Roots are real and unequal.
    Roots are -3.0,-2.0
  Enter the values of a,b,c for quadratic equatio
  : 2 1 3
   a is a real value.
  There are no real solutions.
```



```
C:\Users\DELL\Desktop\JAVA>javac Roots.java

C:\Users\DELL\Desktop\JAVA>java Roots

Enter the Values of a,b,c for a Quadratic equation :

1 -4 4
a is a real value

Roots are real and equal

Roots are :
 2.0,2.0

C:\Users\DELL\Desktop\JAVA>java Roots

Enter the Values of a,b,c for a Quadratic equation :

1 6 8
a is a real value

Roots are real and unequal

Roots are :
 -2.0,-4.0

C:\Users\DELL\Desktop\JAVA>java Roots

Enter the Values of a,b,c for a Quadratic equation :

3 1 2
a is a real value

There are no Real Solutions

C:\Users\DELL\Desktop\JAVA>java Roots

Enter the Values of a,b,c for a Quadratic equation :

0 1 2
a cannot be equal to zero
```

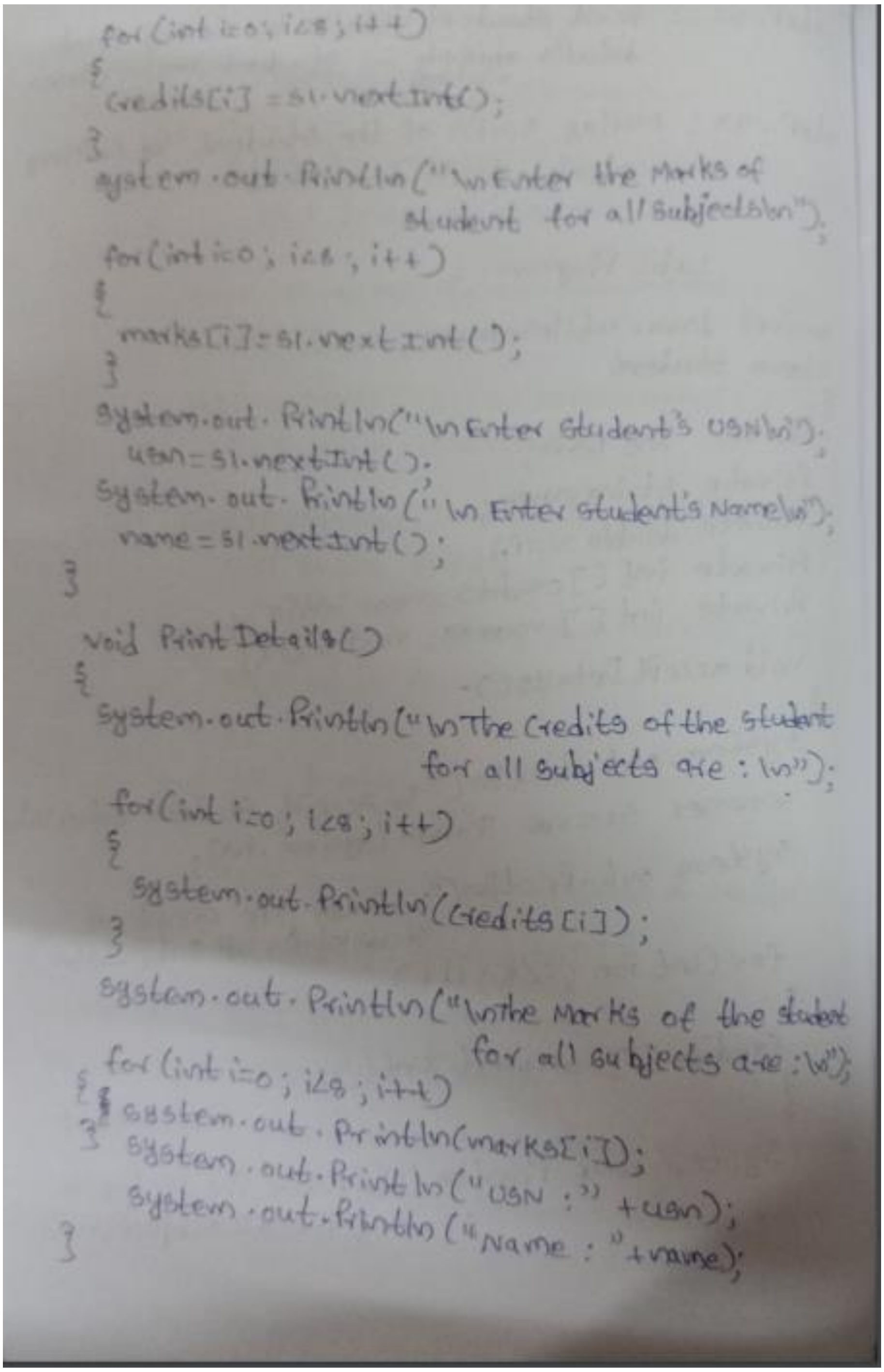
Lab-Program-2:

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 SGPA of a student

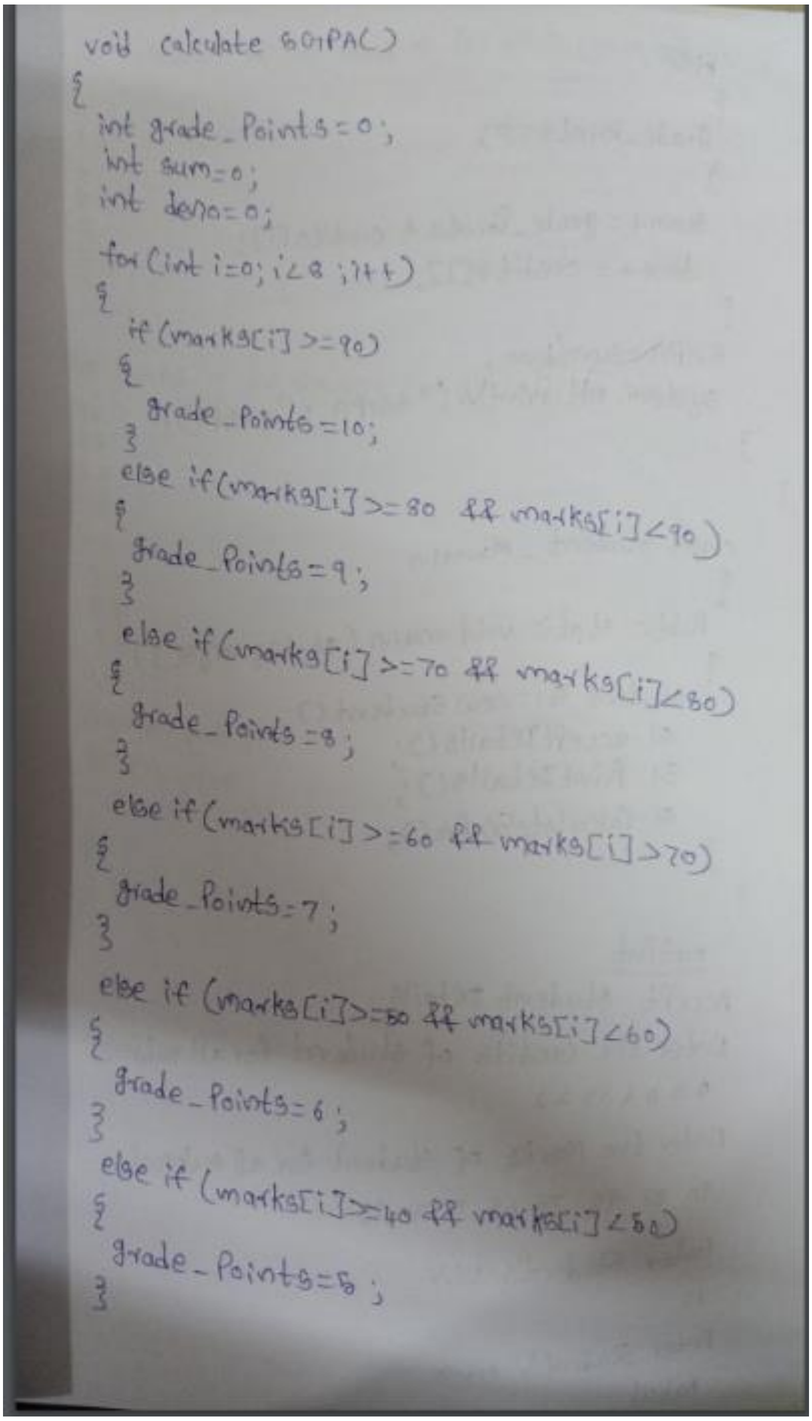


Lab - Program - 2

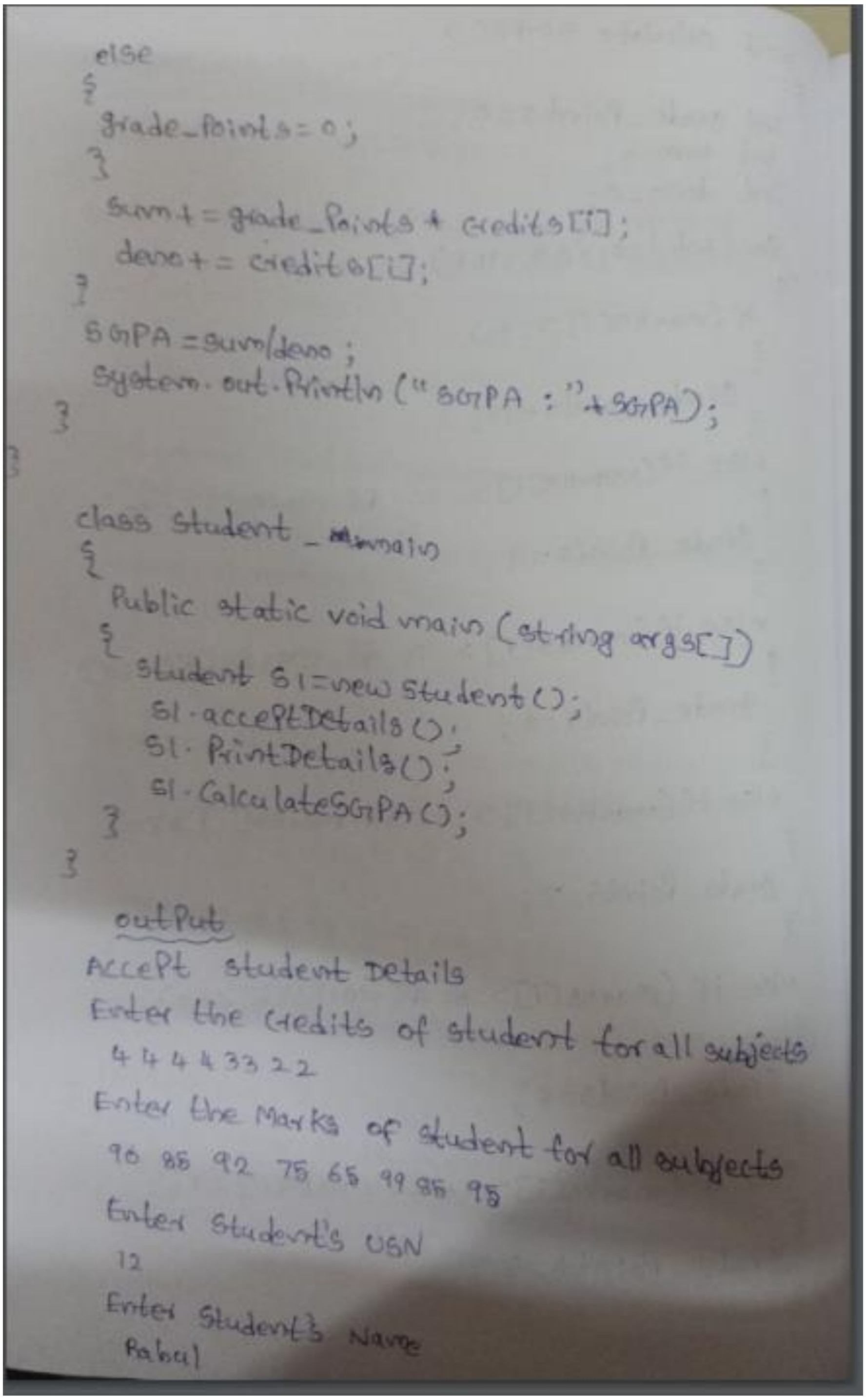
```
import java. util.scanner;
class student
{
 Private  int usn;
 Private string name;
 Private double SGPA;
 Private int []credits = new int[8];
 Private  int [] marks= new int[8];
 Void accept Details()-
{
 system.out.Println(" \nAccept Student details\n")
 scanner s1 = new scanner (system.in);
 system. out. Println("\nEnter the credits of
                        student for all Subjects\n");
 for (int i=0 ; i<8 ; i++)
 {
 credits [i]= s1.next Int();
 }
 system. out. Println ("\nEnter the credits of
                        student for all subjects\n");
```



```
  for (int i=0; i<8; i++)
  {
   credits[i] = s1.nextInt();
  }
  system.out.Println("\nEnter the Marks of
                         student for all subjects\n");
  for(int i=0; i<8; i++)
  {
   marks[i]=s1.nextInt();
  }
  system.out.Println("\nEnter student's USN\n");
   usn=s1.nextInt().
  system.out.Println("\nEnter student's Name\n");
   name=s1.nextInt();
}

 void PrintDetails()
 {
  system.out.Println("\nThe credits of the student
                          for all subjects are :\n");
  for(int i=0; i<8; i++)
  {
   system.out.Println(credits[i]);
  }
  system.out.Println("\nthe Marks of the student
                          for all subjects are :\n");
  for (int i=0; i<8; i++)
 { { system.out.Println(marks[i]);
 }  system.out.Println("USN : " +usn);
    system.out.Println("Name : "+name);
}
```



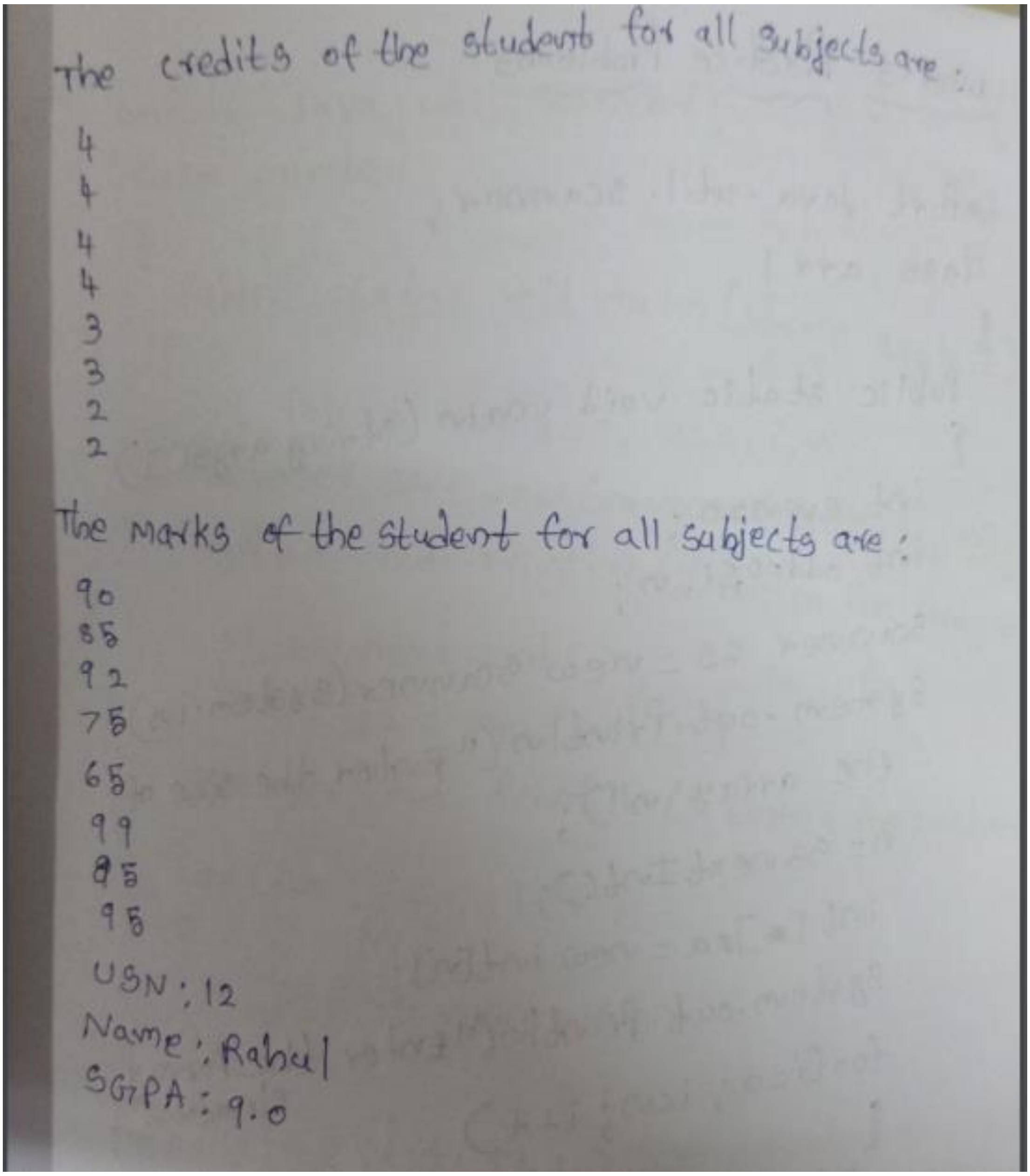
```
void calculate SGPA()
{
 int grade_Points=0;
 int sum=0;
 int deno=0;
 for(int i=0;i<8;i++)
 {
   if(marks[i]>=90)
   {
    grade_Points=10;
   }
   else if(marks[i]>=80 && marks[i]<90)
   {
    grade_Points=9;
   }
   else if(marks[i]>=70 && marks[i]<80)
   {
    grade_Points=8;
   }
  else if(marks[i]>=60 && marks[i]>70)
  {
   grade_Points=7;
  }
  else if (marks[i]>=50 && marks[i]<60)
  {
   grade_Points=6;
  }
  else if (marks[i]>=40 && marks[i]<50)
  {
   grade_Points=5;
  }
```



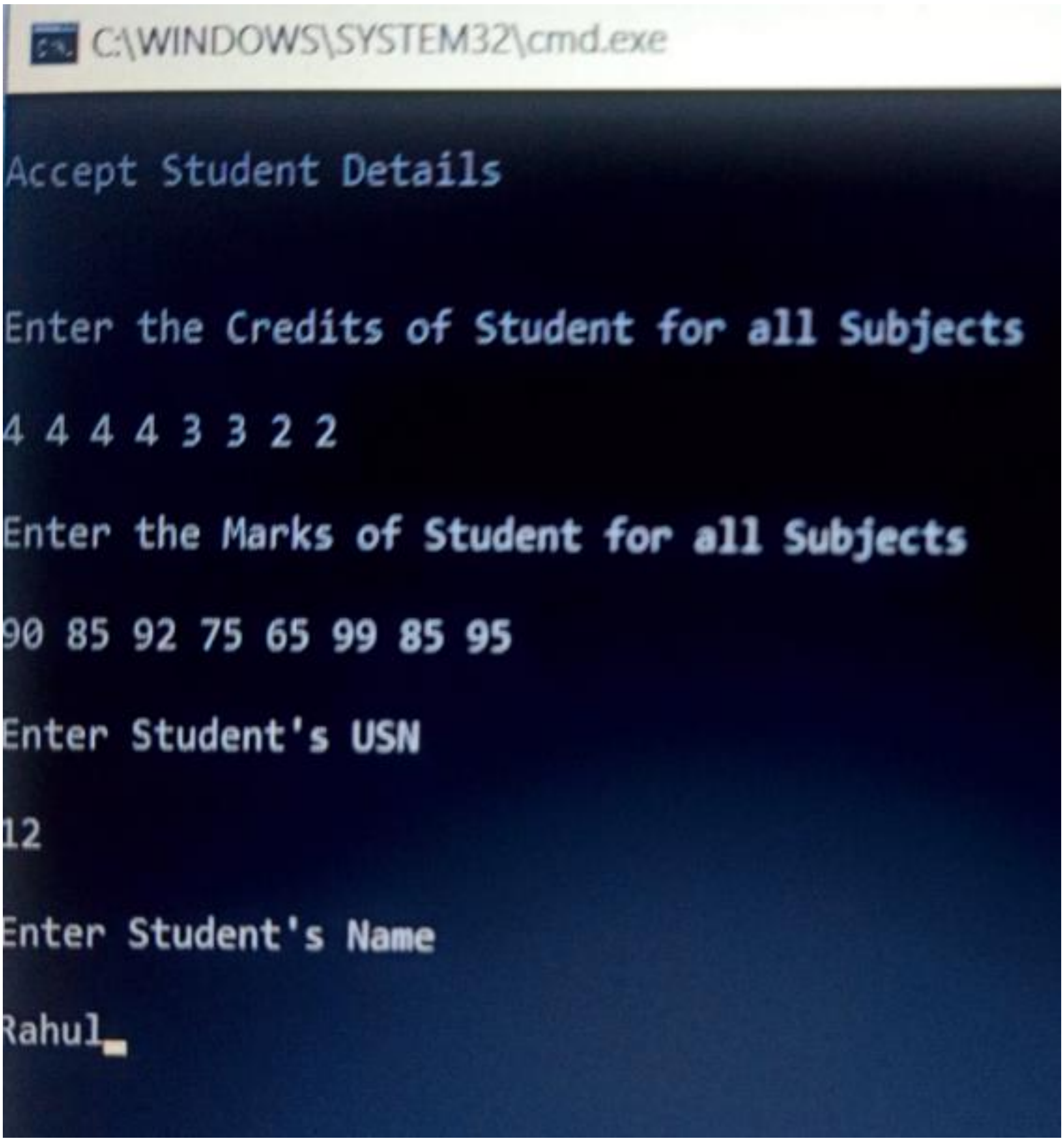
```
  else
  {
   grade_Points=0;
  }
   sum+=grade_Points * credits[i];
    deno+=credits[i];
 }
 SGPA=sum/deno;
 System.out.Println("SGPA : "+SGPA);
}
}

class Student_main
{
  Public static void main(string args[])
  {
    Student S1=new Student();
     S1.acceptDetails();
     S1.PrintDetails();
     S1.CalculateSGPA();
  }
}
```

output

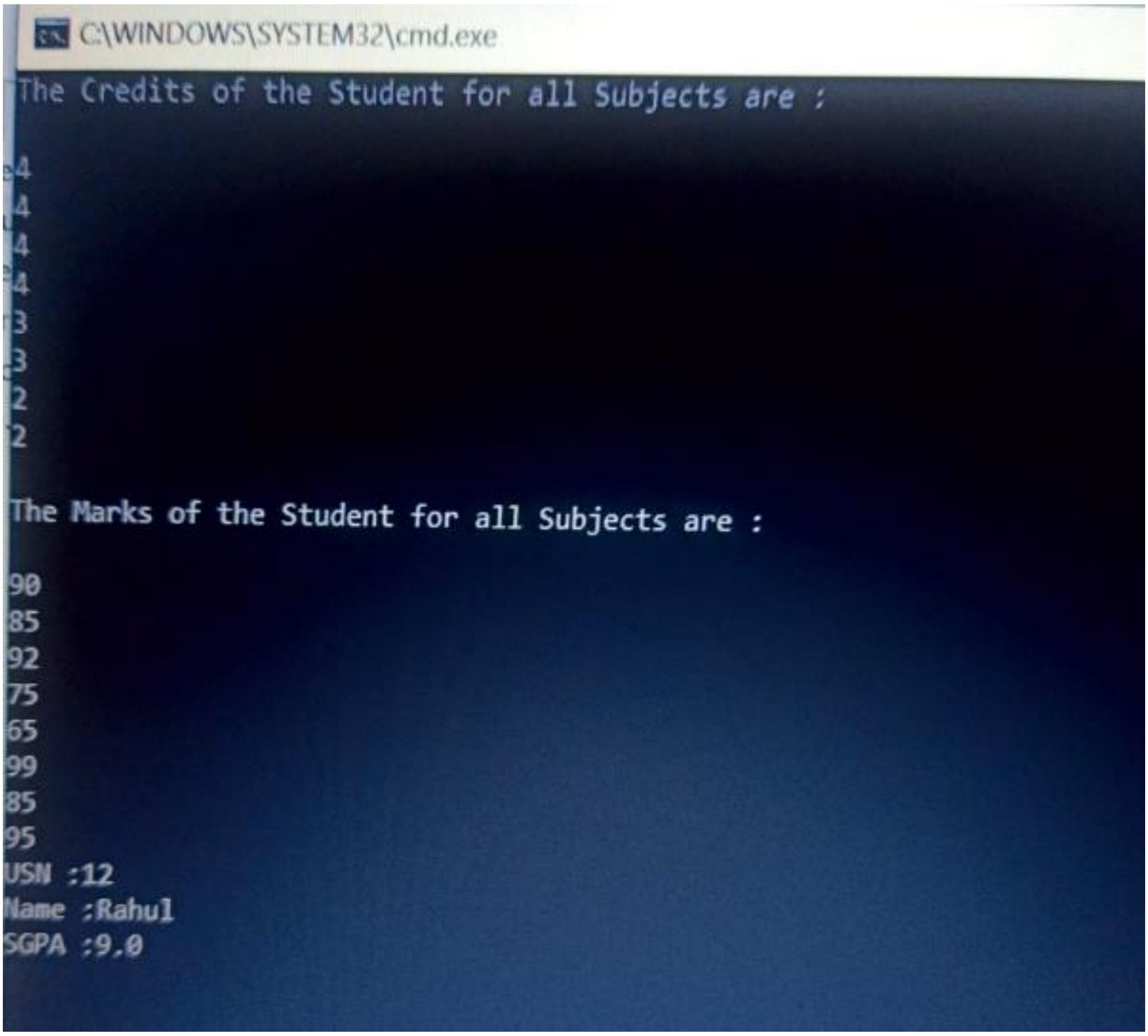
```
Accept student Details
Enter the Credits of student for all subjects
 4 4 4 4 3 3 2 2
Enter the Marks of student for all subjects
 90 85 92 75 65 99 85 95
Enter Student's USN
 12
Enter Student's Name
 Rahul
```



```
The credits of the student for all subjects are :
4
4
4
4
3
3
2
2
The marks of the student for all subjects are :
90
85
92
75
65
99
85
95
USN : 12
Name : Rahul
SGPA : 9.0
```



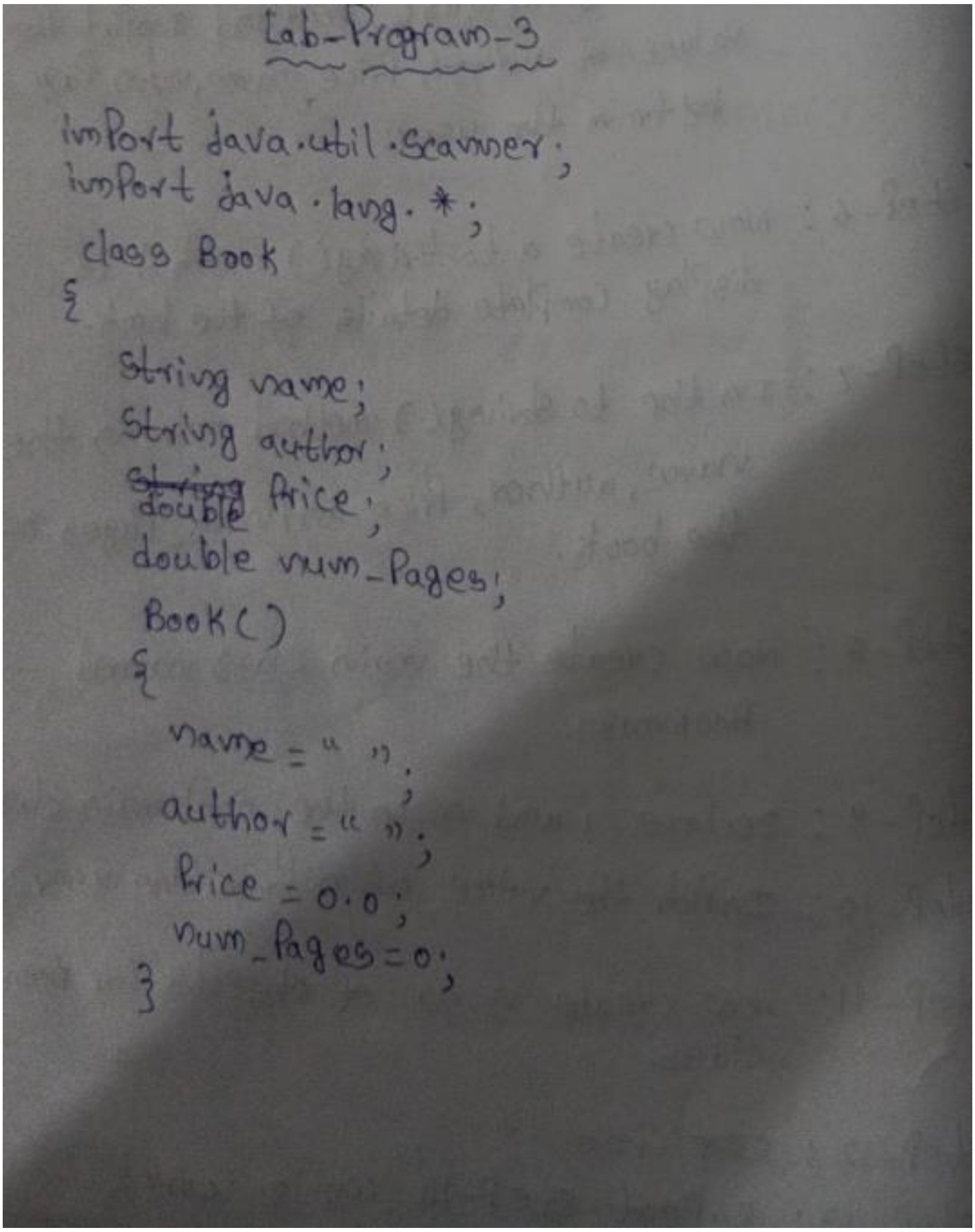
```
Accept Student Details

Enter the Credits of Student for all Subjects
4 4 4 4 3 3 2 2
Enter the Marks of Student for all Subjects
90 85 92 75 65 99 85 95
Enter Student's USN
12
Enter Student's Name
Rahul_
```



```
The Credits of the Student for all Subjects are :

4
4
4
4
3
3
2
2

The Marks of the Student for all Subjects are :

90
85
92
75
65
99
85
95
USN :12
Name :Rahul
SGPA :9.0
```

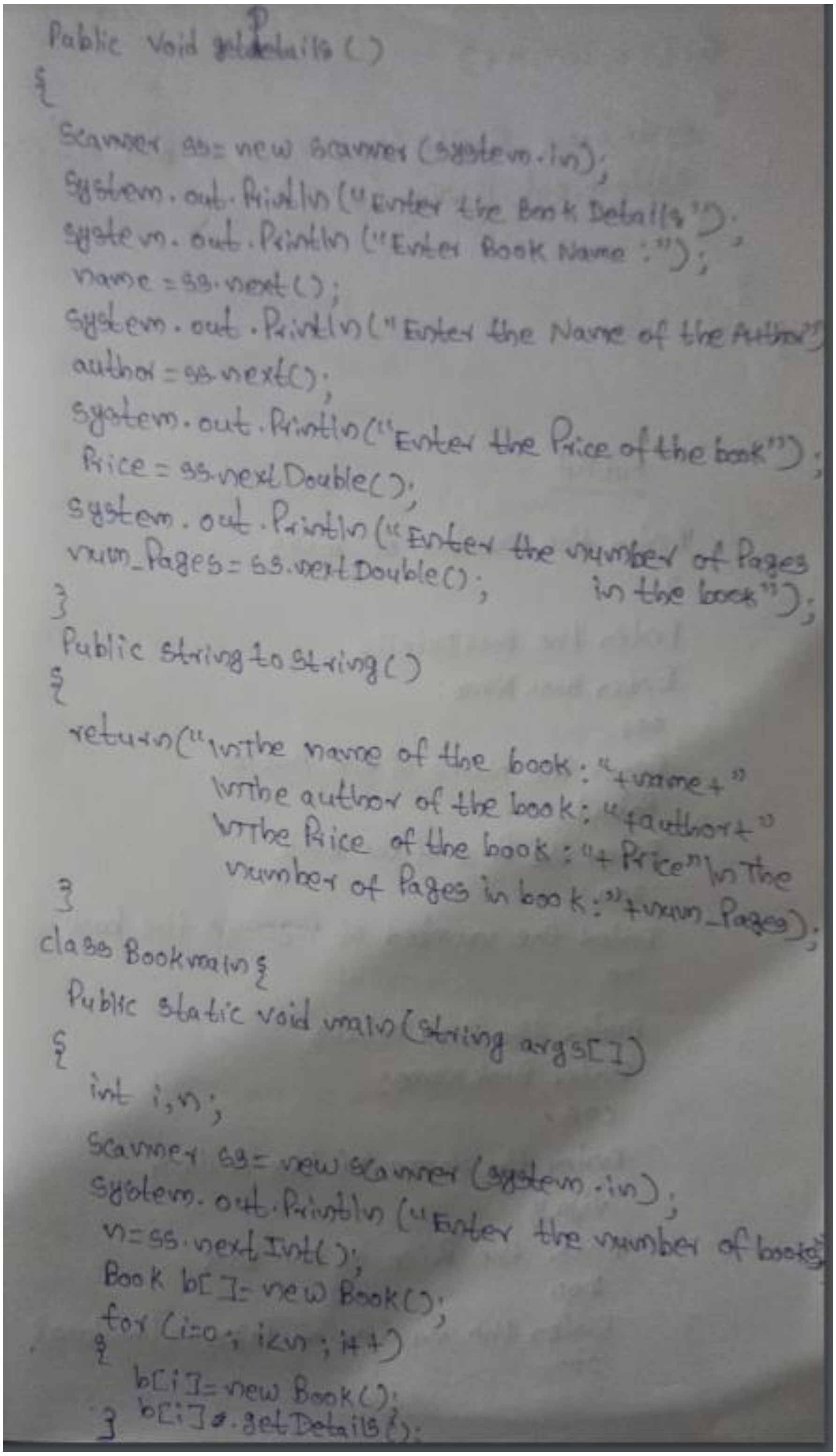
Lab-Program-3:

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 a book object



Lab-Program-3

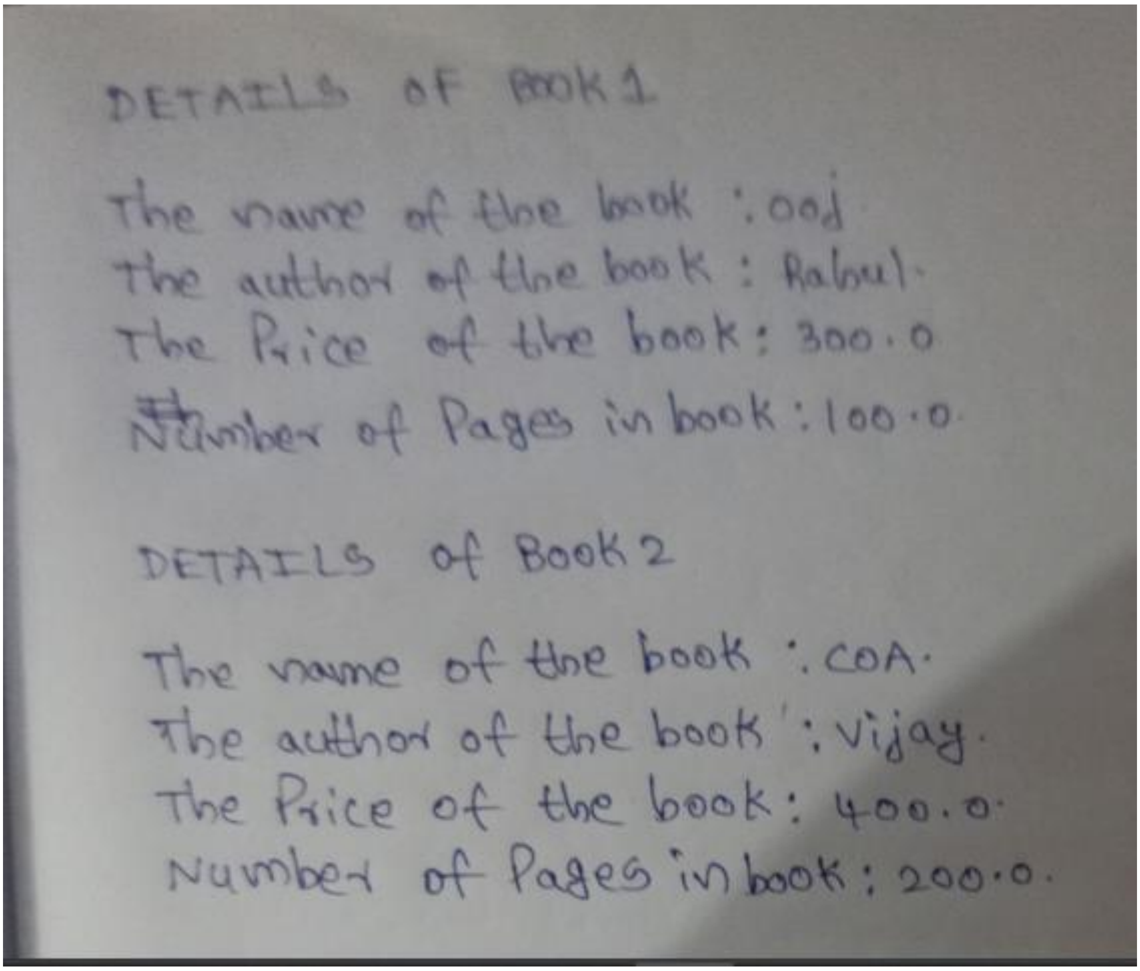
```
import java.util.Scanner;
import java.lang.*;
 class Book
{
    String name;
    String author;
    ~~String~~ double price;
    double num_Pages;
     Book()
     {
        name = " ";
        author = " ";
         price = 0.0;
        num_Pages=0;
     }
```



```
Public void getDetails ()
{
 Scanner ss= new Scanner (system.in);
 system.out.Println("Enter the Book Details");
 system.out.Println ("Enter Book Name :");
  name =ss.next();
 system.out.Println("Enter the Name of the Author")
  author =ss.next();
 system.out.Println("Enter the Price of the book");
  Price = ss.nextDouble();
 system.out.Println("Enter the number of Pages
 num_Pages= ss.nextDouble();              in the book");
}
 Public string toString()
{
 return("\nthe name of the book: "+name+"
            \nthe author of the book: "+author+"
            \nThe Price of the book: "+Price"\nThe
             number of Pages in book:"+num_Pages);
}
class Bookmain{
 Public static void main(string args[])
{
  int i,n;
  Scanner ss= new Scanner (system.in);
  system.out.Println ("Enter the number of books
   n=ss.nextInt();
   Book b[]= new Book();
   for (i=0; i<n; i++)
   {
     b[i]=new Book();
   } b[i].getDetails();
  for (i=0; i<n; i++)
  {
   system.out.Println ("DETAILS OF Book"+(i+1));
   system.out.Println (b[i]);
  }
 }
}
```

outPut

```
Enter the number of books
2
Enter the BookDetails
Enter Book Name:
ooj
Enter the Name of the Author
Rahul
Enter the Price of the book
300
Enter the number of Pages in the book
100
Enter the Book Details
Enter Book Name:
COA.
Enter the Name of the Author
vijay
Enter the Price of the book
400
Enter the number of Pages in the book
200
```

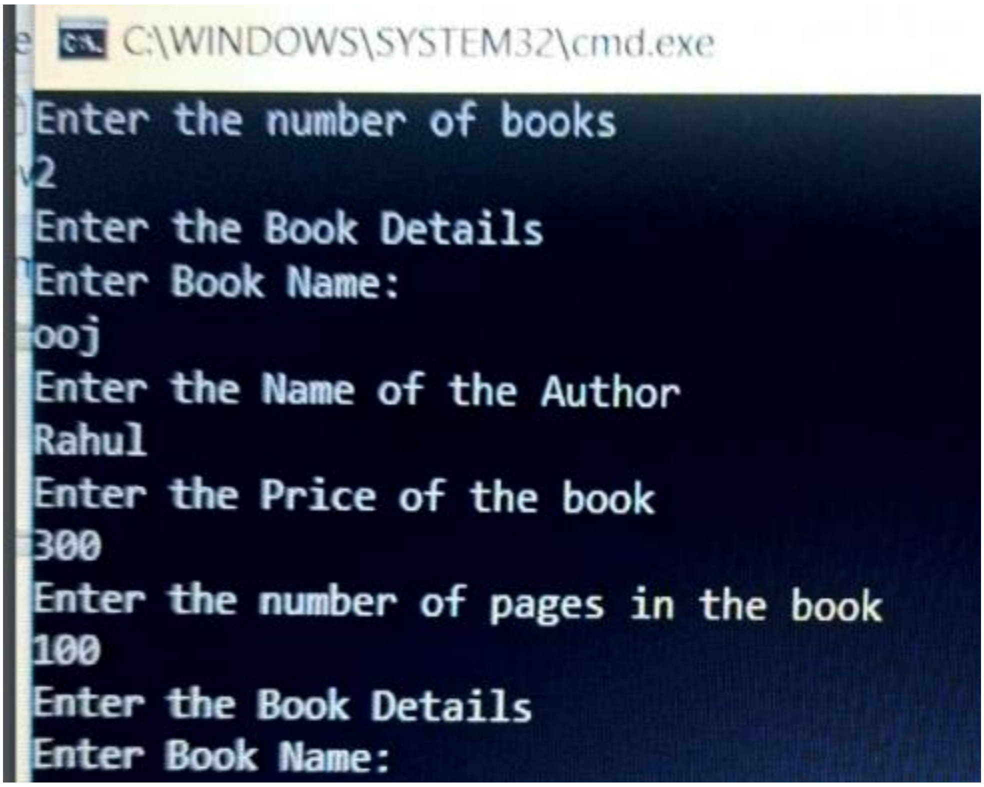


DETAILS OF BOOK 1

The name of the book :. ooj
The author of the book : Rahul.
The Price of the book : 300.0
Number of Pages in book : 100.0.

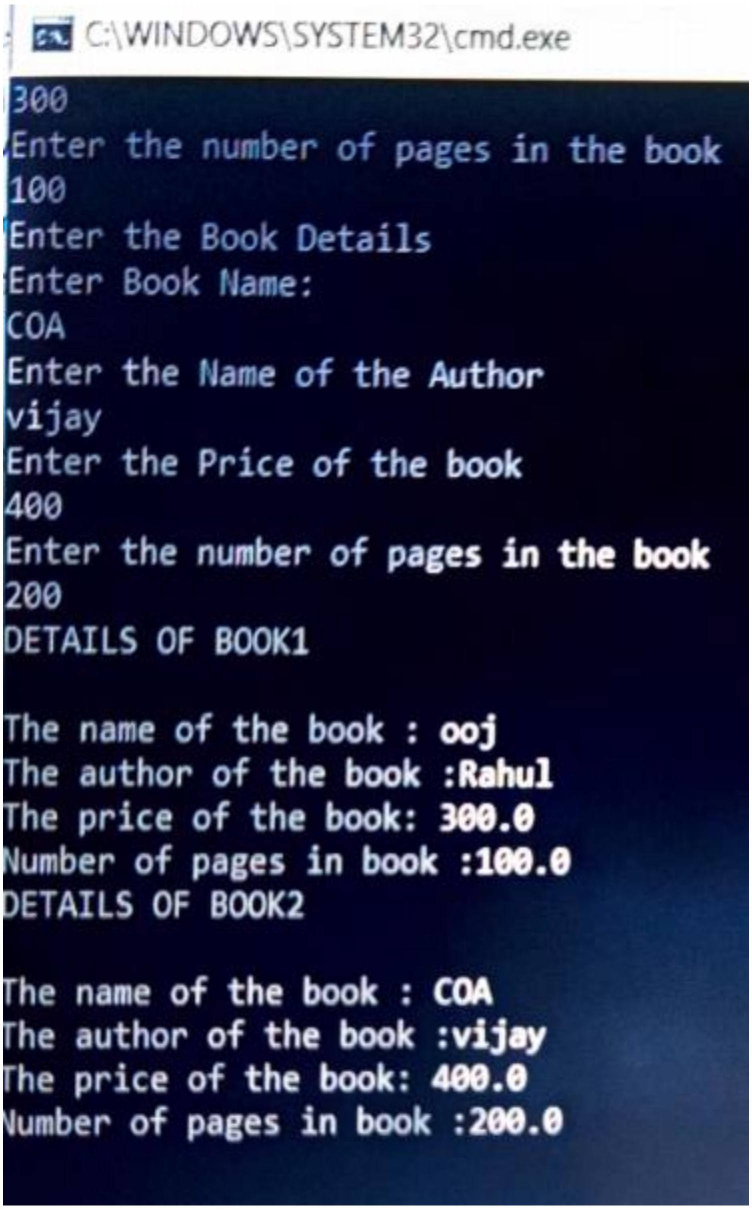
DETAILS of Book 2

The name of the book :. COA.
The author of the book :. vijay.
The Price of the book : 400.0.
Number of Pages in book : 200.0.



C:\WINDOWS\SYSTEM32\cmd.exe

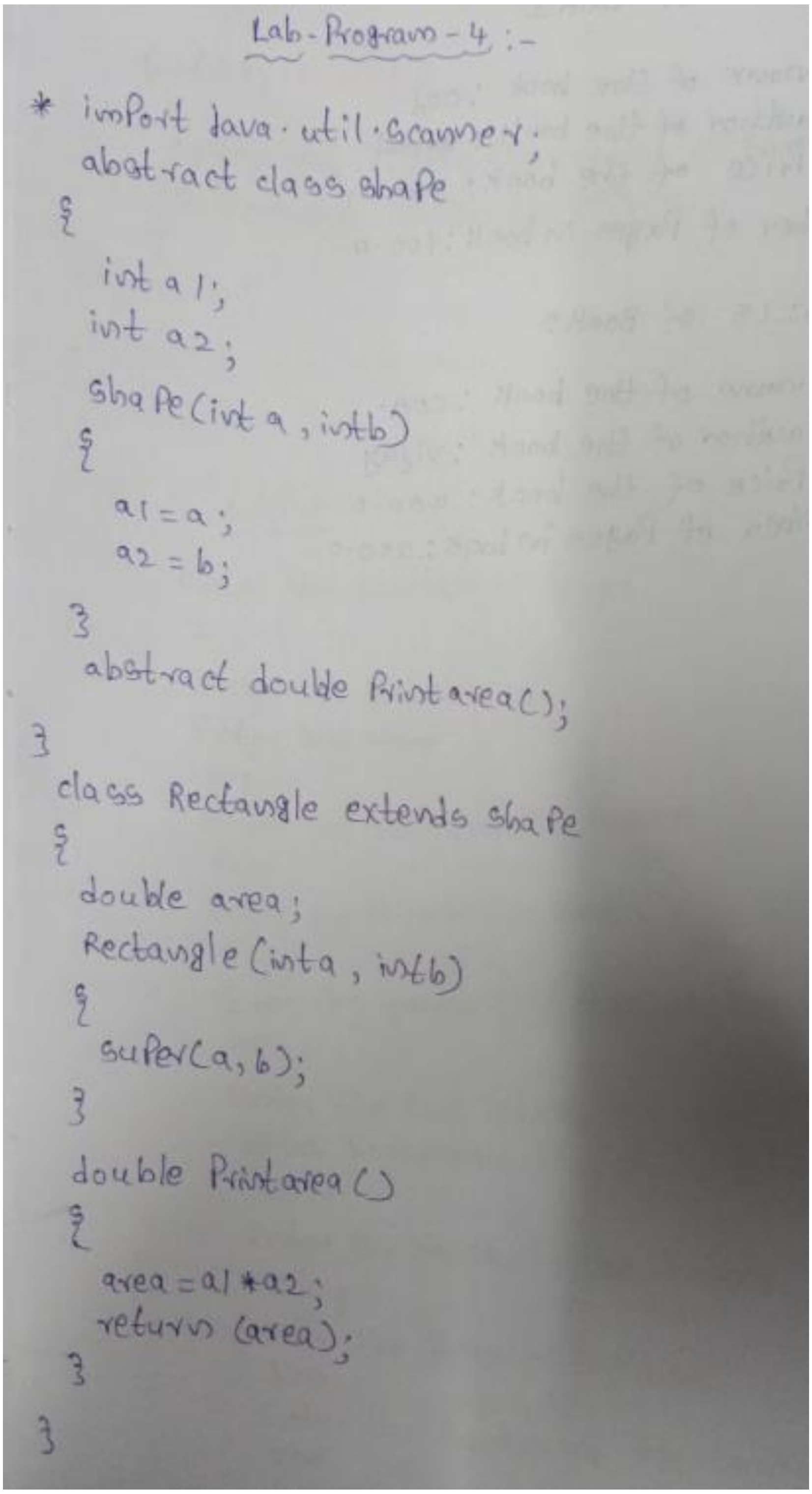
```
Enter the number of books
2
Enter the Book Details
Enter Book Name:
ooj
Enter the Name of the Author
Rahul
Enter the Price of the book
300
Enter the number of pages in the book
100
Enter the Book Details
Enter Book Name:
```



```
300
Enter the number of pages in the book
100
Enter the Book Details
Enter Book Name:
COA
Enter the Name of the Author
vijay
Enter the Price of the book
400
Enter the number of pages in the book
200
DETAILS OF BOOK1

The name of the book : ooj
The author of the book :Rahul
The price of the book: 300.0
Number of pages in book :100.0
DETAILS OF BOOK2

The name of the book : COA
The author of the book :vijay
The price of the book: 400.0
Number of pages in book :200.0
```

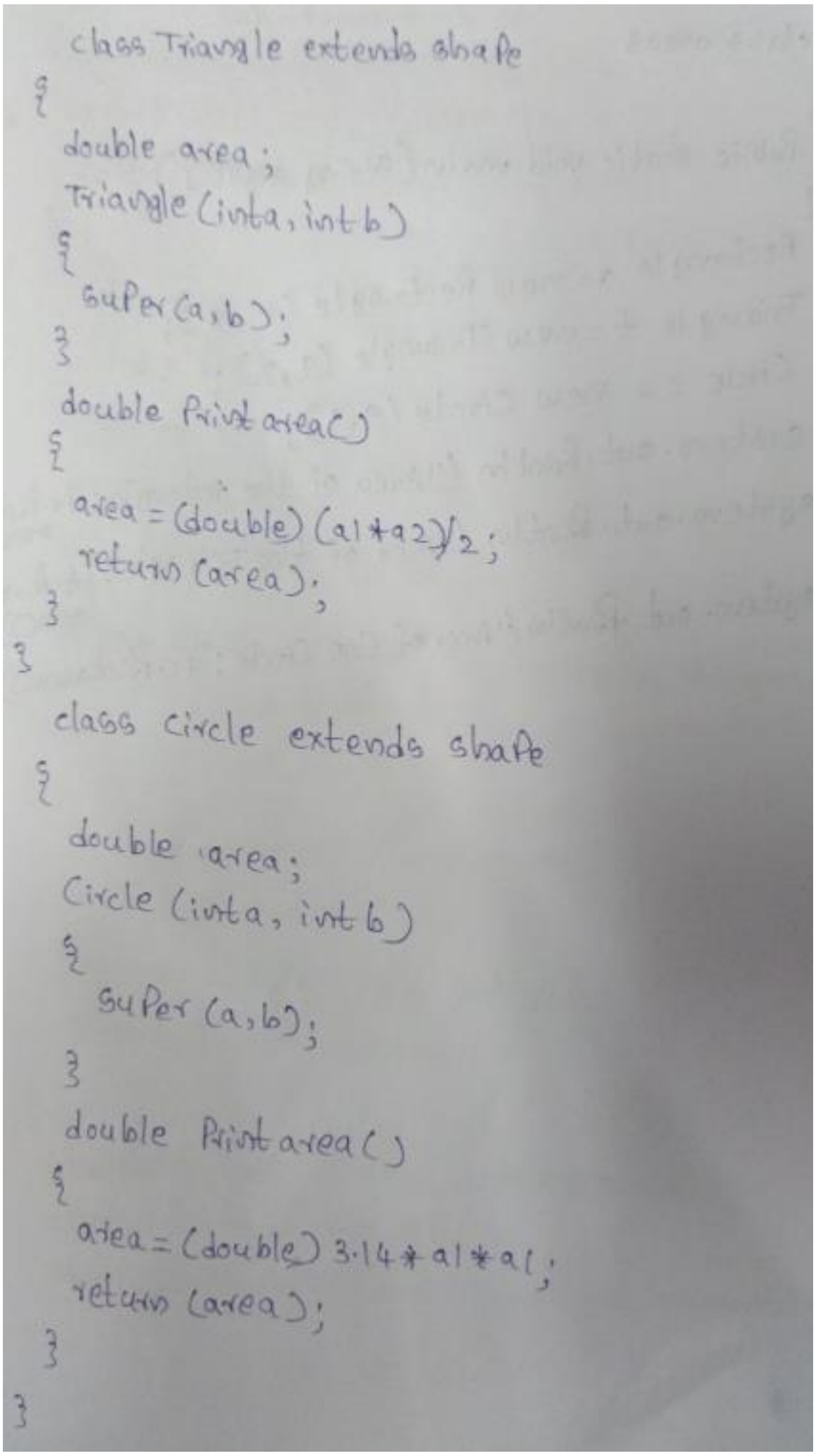
Lab-Program-4:

Develop a Java program to create an abstract class named Shape that contains two integers and an empty method named printArea( ). Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape. Each one of the classes contain only the method printArea( ) that prints the area of the given shape

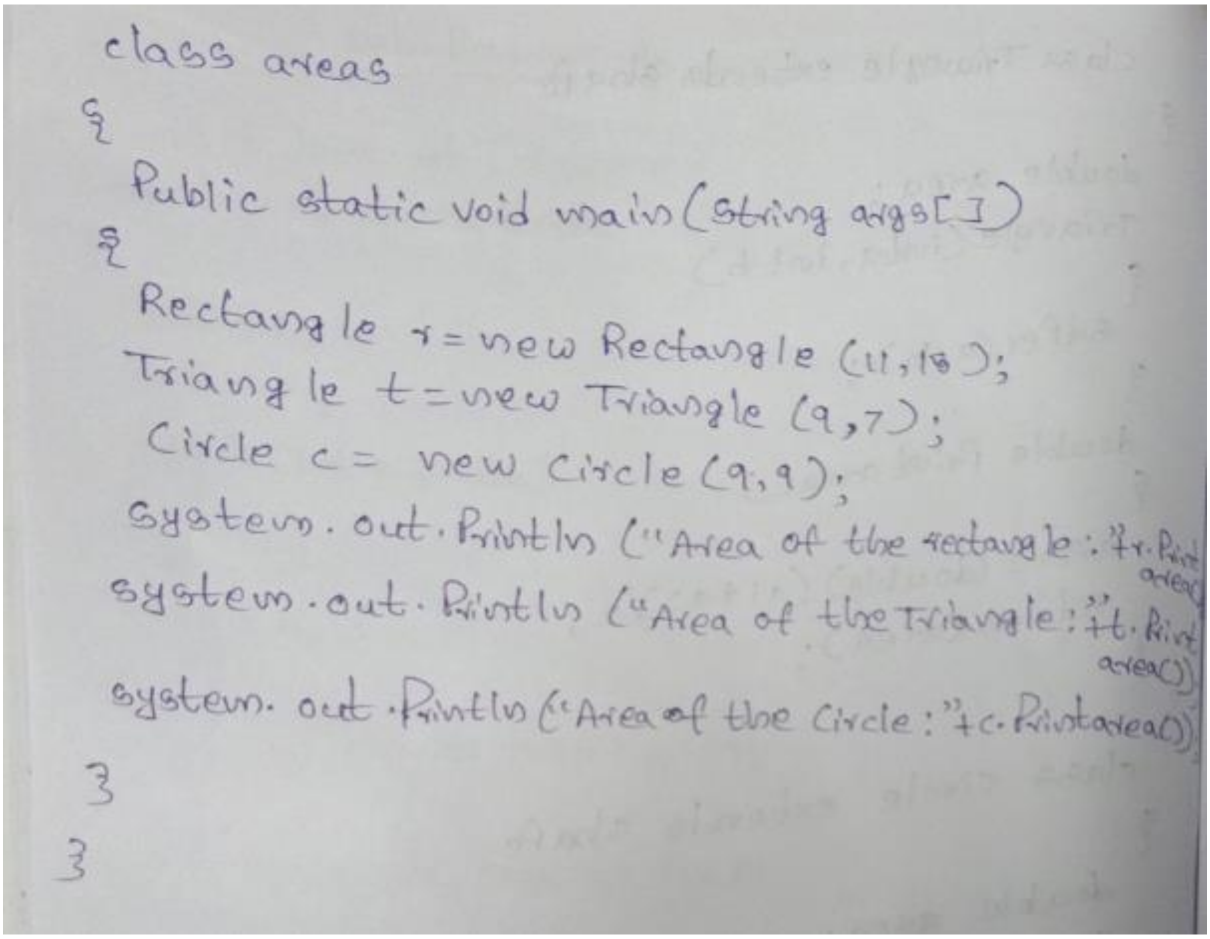


Lab-Program-4 :-

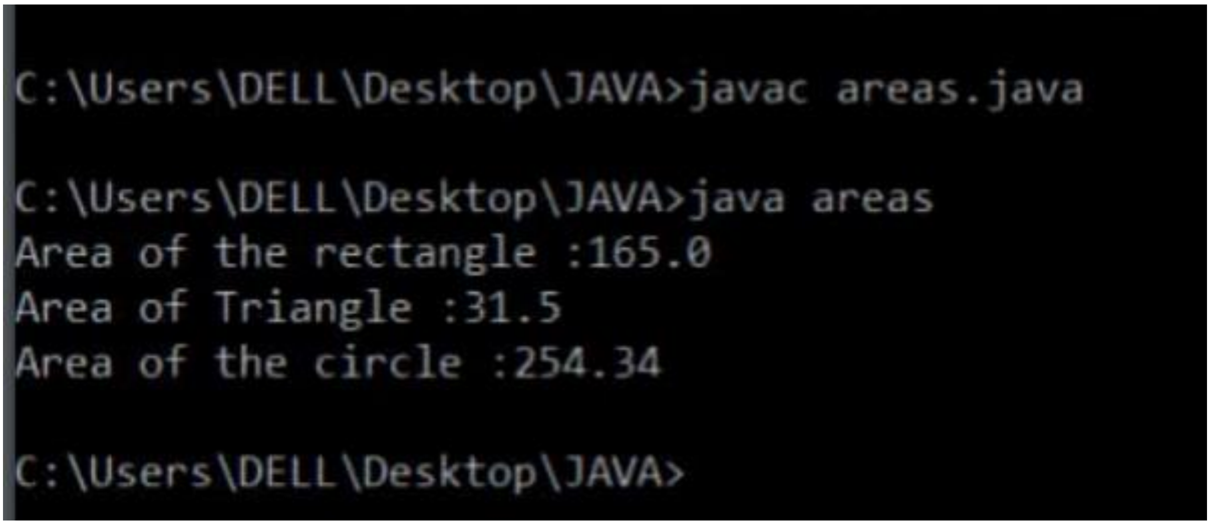
```
* import java.util.Scanner;
  abstract class shape
 {
   int a1;
   int a2;
   shape(int a, intb)
   {
     a1 = a;
     a2 = b;
   }
   abstract double Printarea();
}
 class Rectangle extends shape
 {
   double area;
   Rectangle (inta, intb)
   {
    super(a, b);
   }
   double Printarea()
   {
    area = a1 * a2;
    return (area);
   }
 }
```



```
 class Triangle extends shape
{
 double area;
 Triangle (inta, int b)
 {
  super(a,b);
 }
 double Print area()
 {
  area = (double) (a1*a2)/2;
  return (area);
 }
}
 class circle extends shape
{
 double area;
 Circle (inta, int b)
 {
   super (a,b);
 }
 double Print area()
 {
  area = (double) 3.14*a1*a1;
  return (area);
 }
}
```



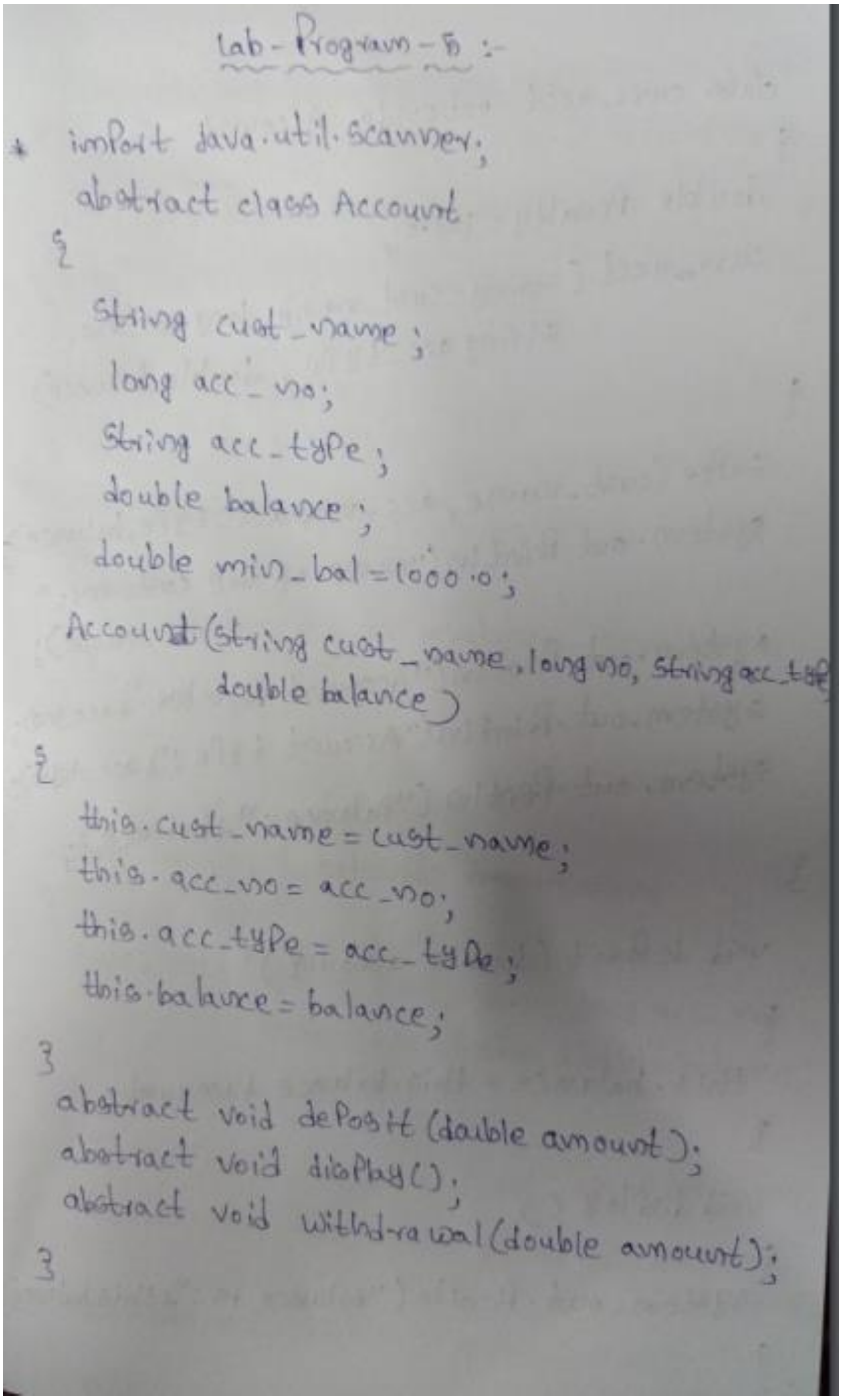
```
class areas
{
 Public static void main(String args[])
 {
  Rectangle r=new Rectangle (11,18);
  Triangle t=new Triangle (9,7);
  Circle c= new Circle(9,9);
  system.out.Println ("Area of the rectangle:"+r.Print
                                                  area(
  system.out.Println ("Area of the Triangle:"+t.Print
                                                  area())
  system.out.Println("Area of the Circle:"+c.Printarea())
 }
}
```



```
C:\Users\DELL\Desktop\JAVA>javac areas.java

C:\Users\DELL\Desktop\JAVA>java areas
Area of the rectangle :165.0
Area of Triangle :31.5
Area of the circle :254.34

C:\Users\DELL\Desktop\JAVA>
```

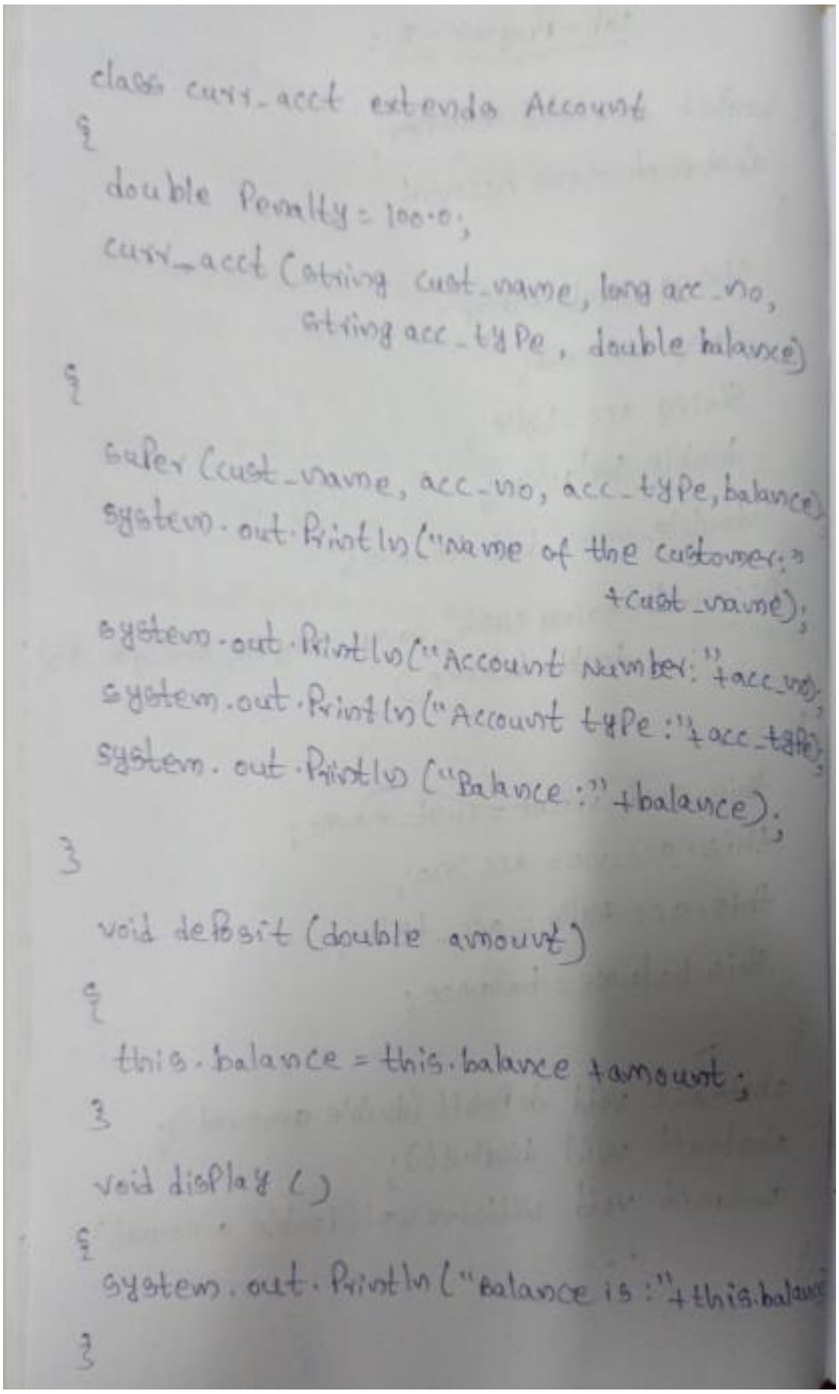
Lab-Program-5:

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

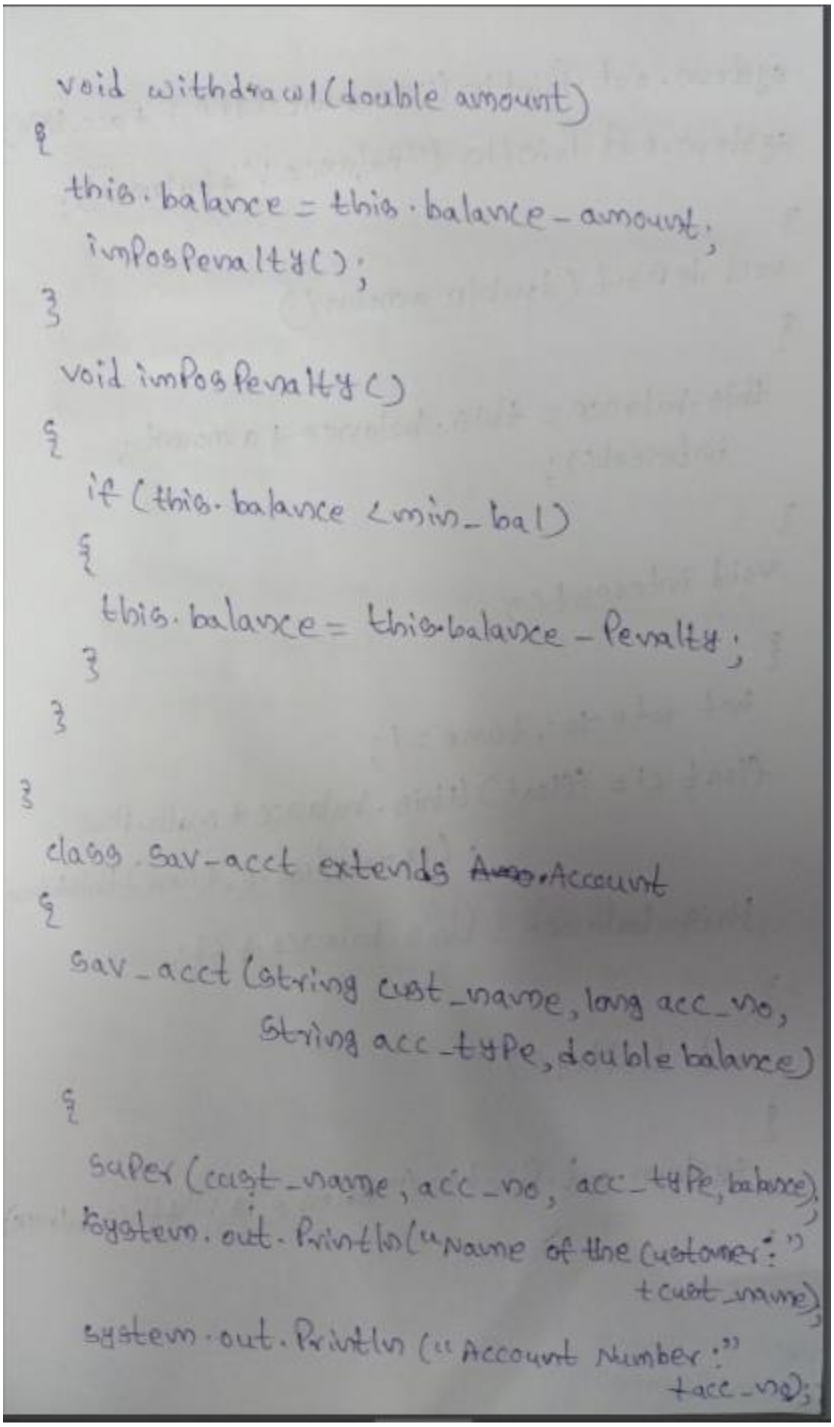


lab - Program - 5 :-

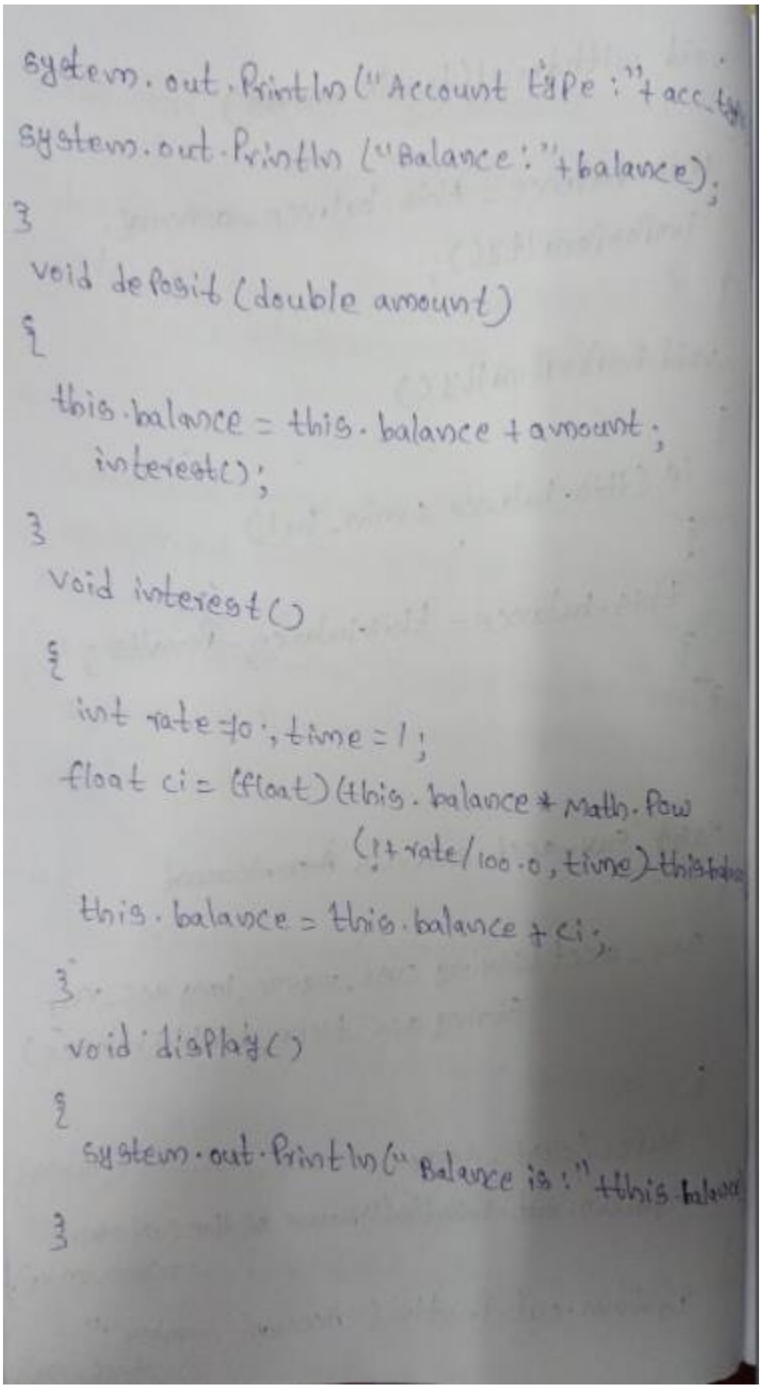
```
* import java.util.scanner;
  abstract class Account
 {
   String cust_name;
    long acc_no;
   String acc_type;
   double balance;
   double min_bal=1000.0;
  Account(String cust_name, long no, String acc_type
              double balance)
 {
   this.cust_name = cust_name;
   this.acc_no = acc_no;
   this.acc_type = acc_type;
   this.balance = balance;
 }
  abstract void deposit(double amount);
  abstract void display();
  abstract void withdrawal(double amount);
 }
```



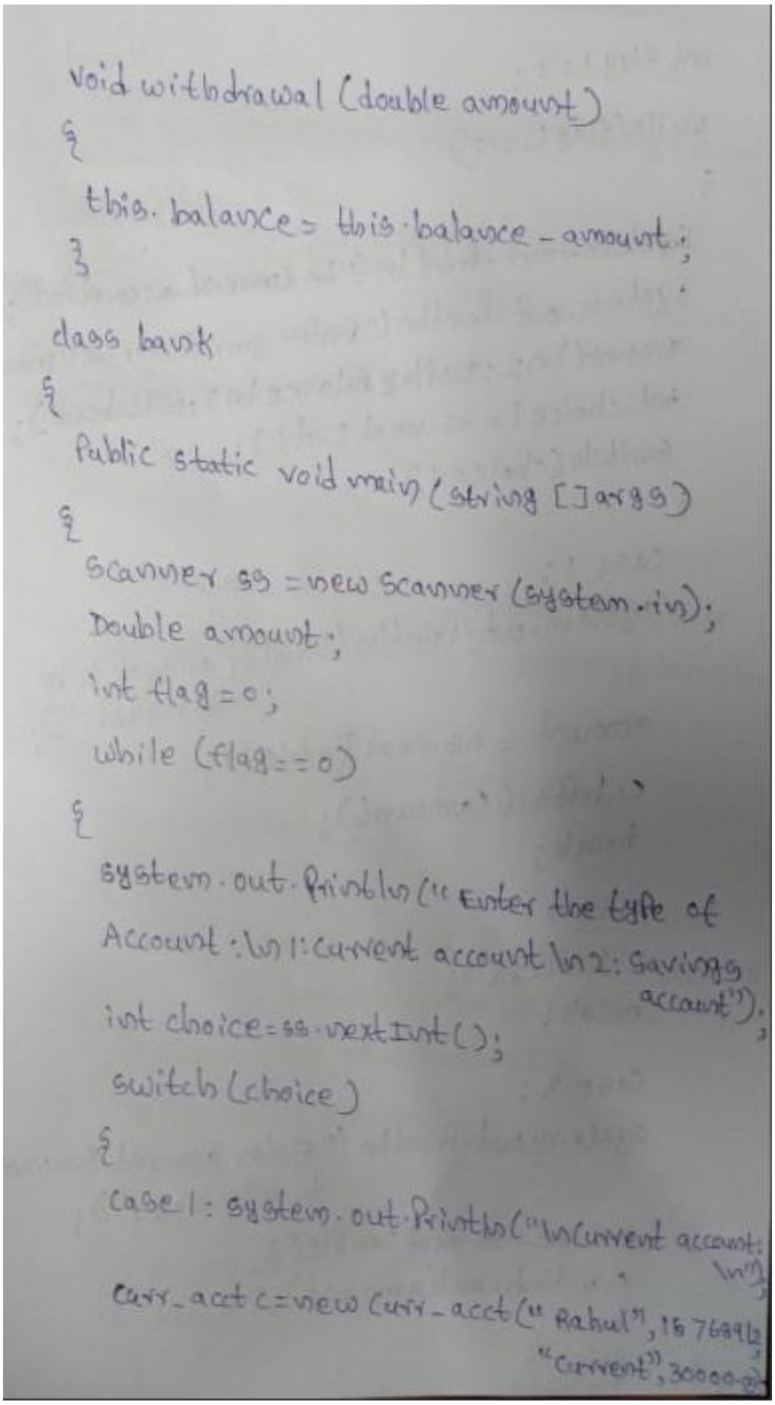
```
class curr_acct extends Account
{
 double Penalty = 100.0;
 curr_acct (String cust_name, long acc_no,
             String acc_type, double balance)
{
 super (cust_name, acc_no, acc_type, balance);
 system.out.Println("Name of the customer:"
                                  +cust_name);
 system.out.Println("Account Number:"+acc_no);
 system.out.Println("Account type:"+acc_type);
 system.out.Println ("Balance:"+balance);
}
 void dePosit (double amount)
 {
  this.balance = this.balance +amount;
 }
 void disPlay ()
{
 system.out.Println("Balance is:"+this.balance
}
```



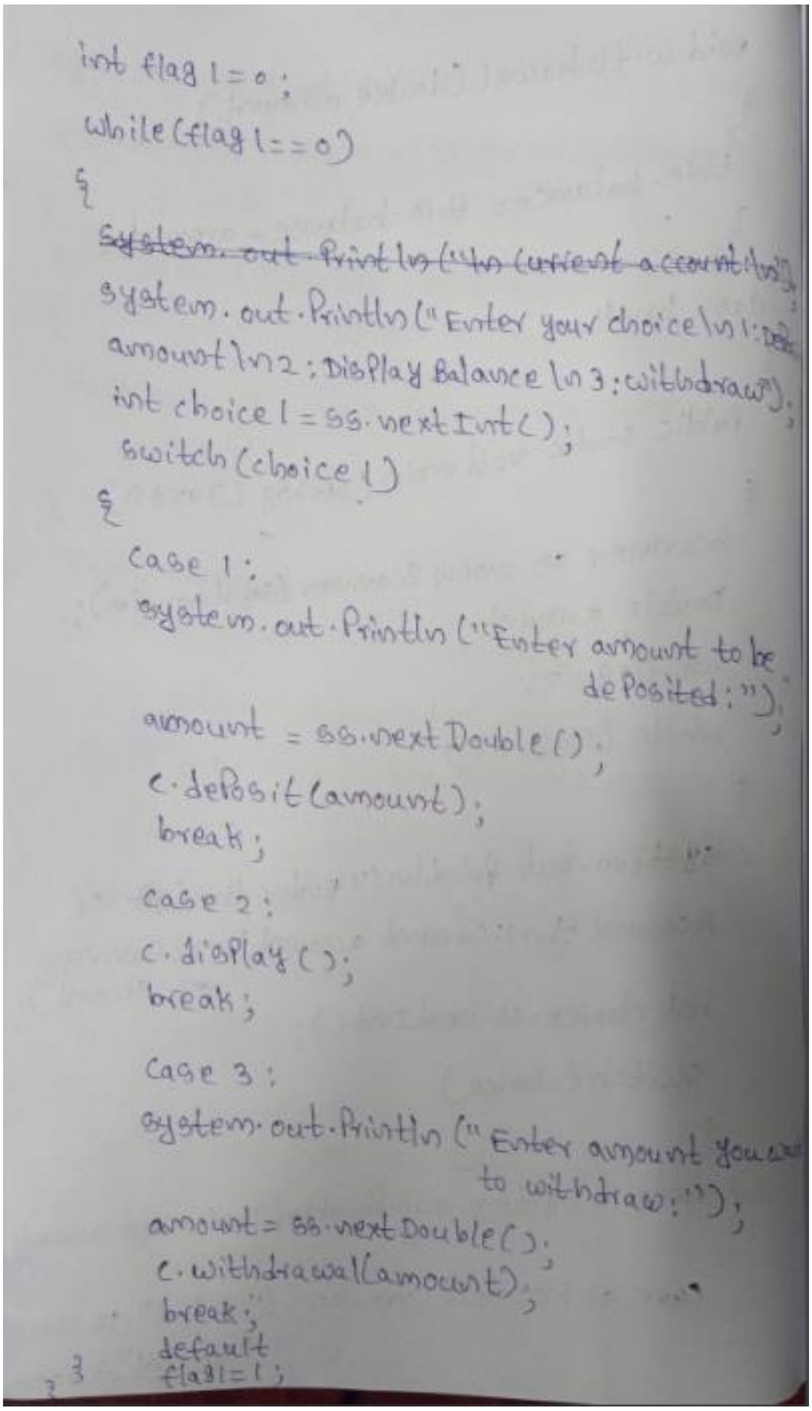
```
  void withdrawl(double amount)
 {
  this.balance = this.balance - amount;
   imPosPenalty();
  }
  void imPosPenalty()
  {
   if(this.balance <min_bal)
   {
    this.balance= this.balance - Penalty;
   }
  }

}
 class Sav-acct extends ~~Acco~~ Account
 {
  Sav_acct(String cust_name, long acc_no,
              String acc_type, double balance)
  {
   super(cust_name, acc_no, acc_type, balance);
   System.out.Println("Name of the customer:"
                                   +cust_name);
   system.out.Println("Account Number:"
                                   +acc_no);
```



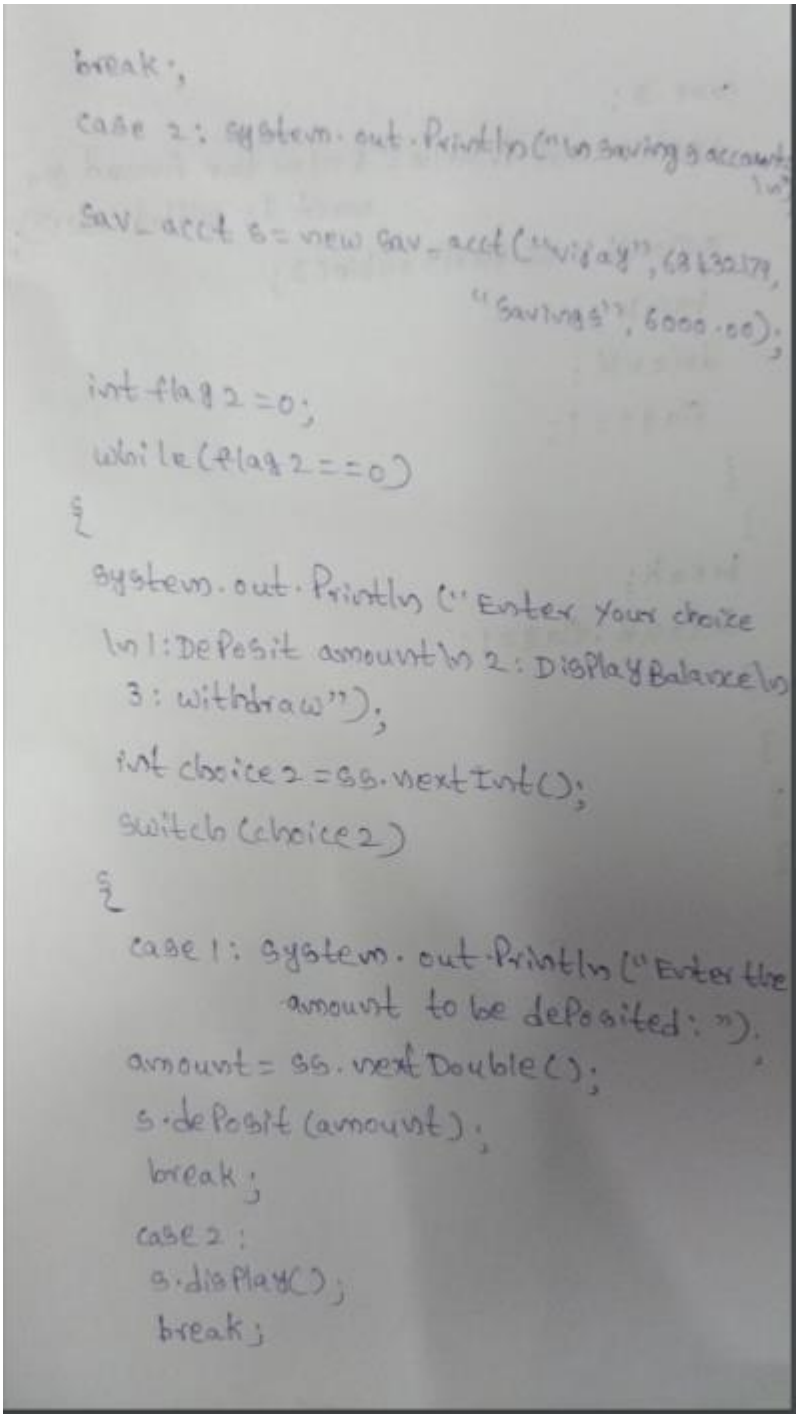
```
system.out.Println("Account type :"+acc_ty
system.out.Println ("Balance:"+balance);
}
 void deposit (double amount)
 {
  this.balance = this.balance + amount;
     interest();
 }
 void interest()
 {
   int rate=10;,time=1;
  float ci= (float)(this.balance * Math.Pow
                       (1+rate/100.0, time)-this.bala
   this.balance = this.balance + ci;
  }
  void display()
  {
   system.out.Println(" Balance is :"+this.balan
  }
```



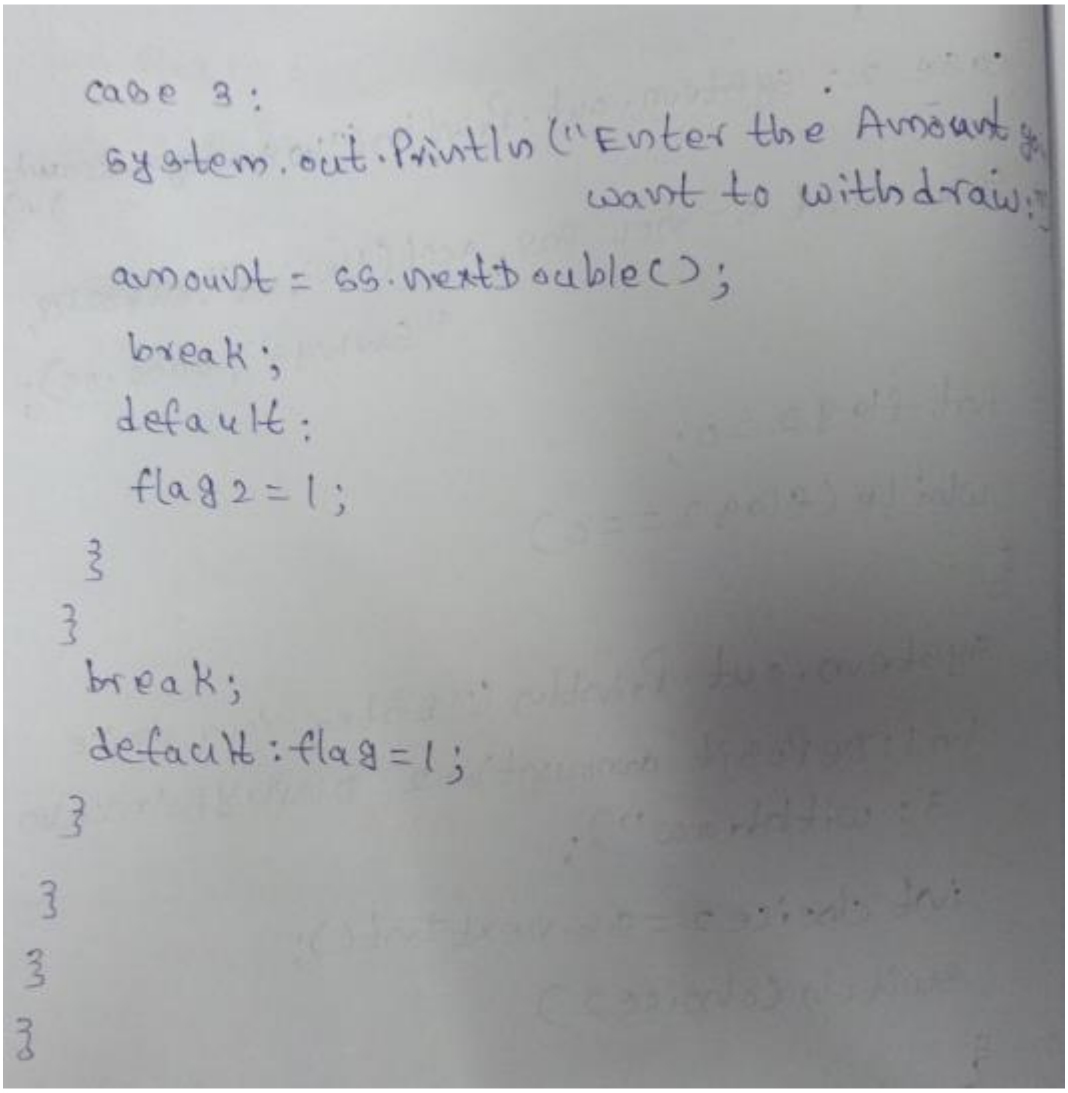
```
void withdrawal (double amount)
{
 this.balance= this.balance - amount;
}

class bank
{
 Public static void main (string []args)
 {
  Scanner ss =new Scanner (system.in);
  Double amount;
  int flag=0;
  while (flag==0)
  {
   system.out.Println("Enter the type of
   Account:\n1:current account\n2: Savings
                                     account");
   int choice=ss.nextInt();
   switch(choice)
   {
   case 1: system.out.Println("\nCurrent account:
                                        \n");
   curr_acct c=new curr_acct(" Rahul",1576896,
                                  "current",30000.00)
```



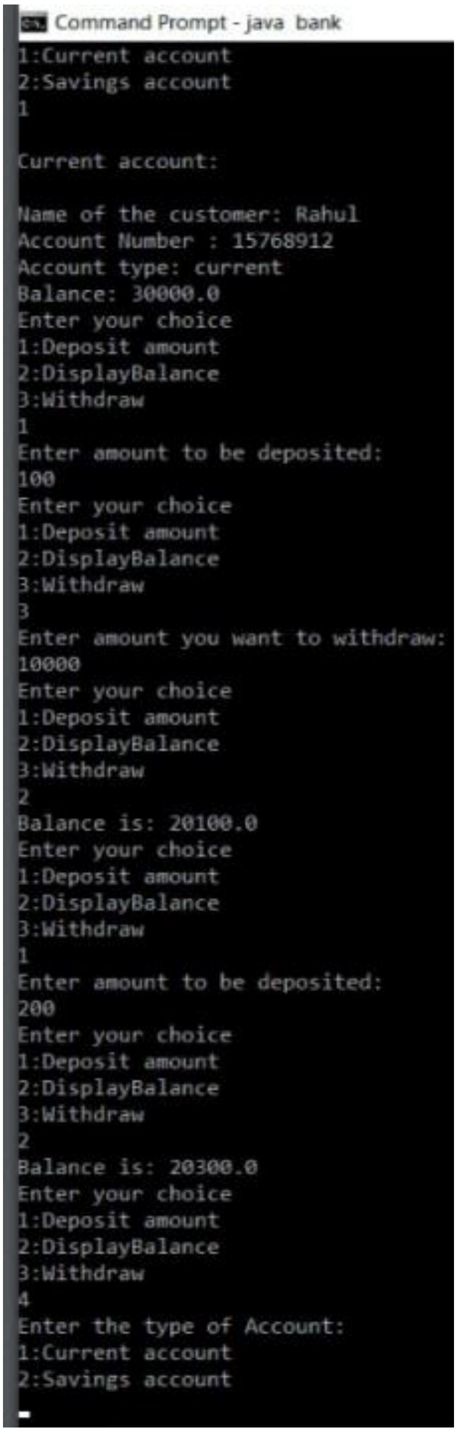
```
int flag1=0;
while(flag1==0)
{
 ~~system.out.Println("\n Current account\n");~~
 system.out.Println("Enter your choice\n1:De
 amount\n2:DisPlay Balance\n3:withdraw");
 int choice1=ss.nextInt();
 switch(choice1)
 {
  case 1:
  system.out.Println("Enter amount to be
                                 dePosited:");
   amount =ss.nextDouble();
   c.dePosit(amount);
   break;
   case 2:
   c.disPlay();
   break;
   Case 3:
   system.out.Println("Enter amount you wa
                              to withdraw:");
   amount=ss.nextDouble();
   c.withdrawal(amount);
   break;
   default
 }  flag1=1;
}
```



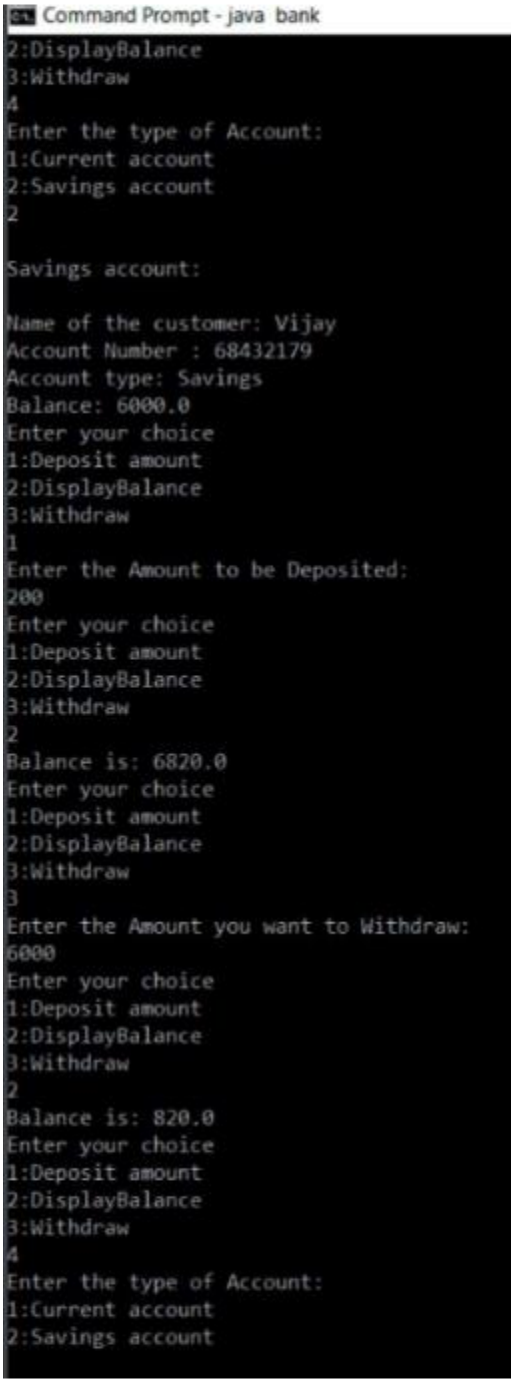
```
break;
case 2: system.out.Println("\n Savings account\n");
Sav_acct s= new Sav_acct("vijay",68432179,
                        "Savings", 6000.00);
 int flag2=0;
 while(flag2==0)
{
 system.out.Println("Enter your choice
 \n1:DePosit amount\n 2: DisPlay Balance\n
  3: withdraw");
 int choice2 =ss.nextInt();
 switch(choice2)
 {
  case1: system.out.Println("Enter the
             amount to be dePosited: ");
 amount= ss.nextDouble();
 s.dePosit(amount);
  break;
  case2:
  s.disPlay();
  break;
```



```
case 3:
 system.out.Println("Enter the Amount yo
                    want to withdraw:"
  amount = ss.nextDouble();
   break;
  default:
   flag2=1;
 }
}
 break;
 default:flag=1;
}
}
}
}
```



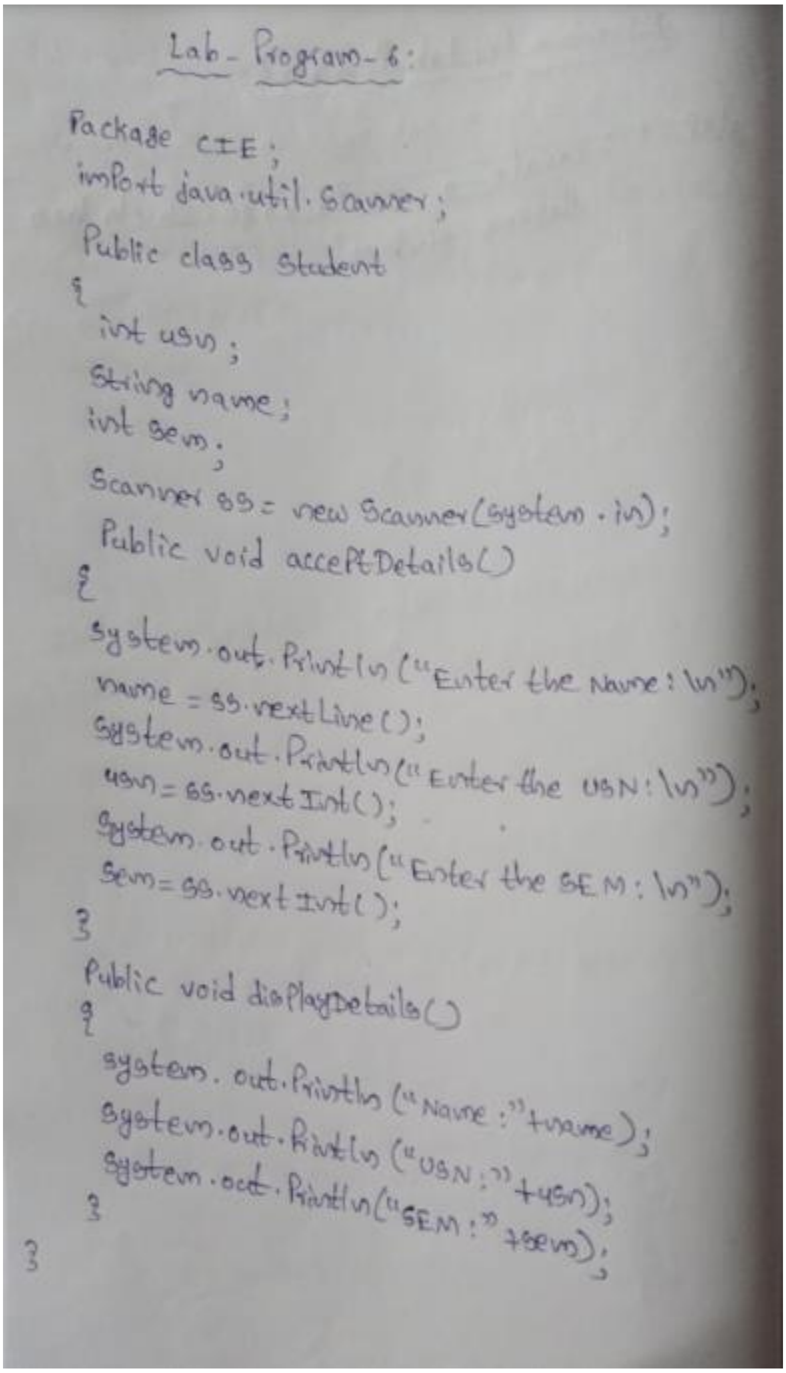
```
1:Current account
2:Savings account
1

Current account:

Name of the customer: Rahul
Account Number : 15768912
Account type: current
Balance: 30000.0
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
1
Enter amount to be deposited:
100
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
3
Enter amount you want to withdraw:
10000
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
2
Balance is: 20100.0
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
1
Enter amount to be deposited:
200
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
2
Balance is: 20300.0
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
4
Enter the type of Account:
1:Current account
2:Savings account
```



```
2:DisplayBalance
3:Withdraw
4
Enter the type of Account:
1:Current account
2:Savings account
2

Savings account:

Name of the customer: Vijay
Account Number : 68432179
Account type: Savings
Balance: 6000.0
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
1
Enter the Amount to be Deposited:
200
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
2
Balance is: 6820.0
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
3
Enter the Amount you want to Withdraw:
6000
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
2
Balance is: 820.0
Enter your choice
1:Deposit amount
2:DisplayBalance
3:Withdraw
4
Enter the type of Account:
1:Current account
2:Savings account
```

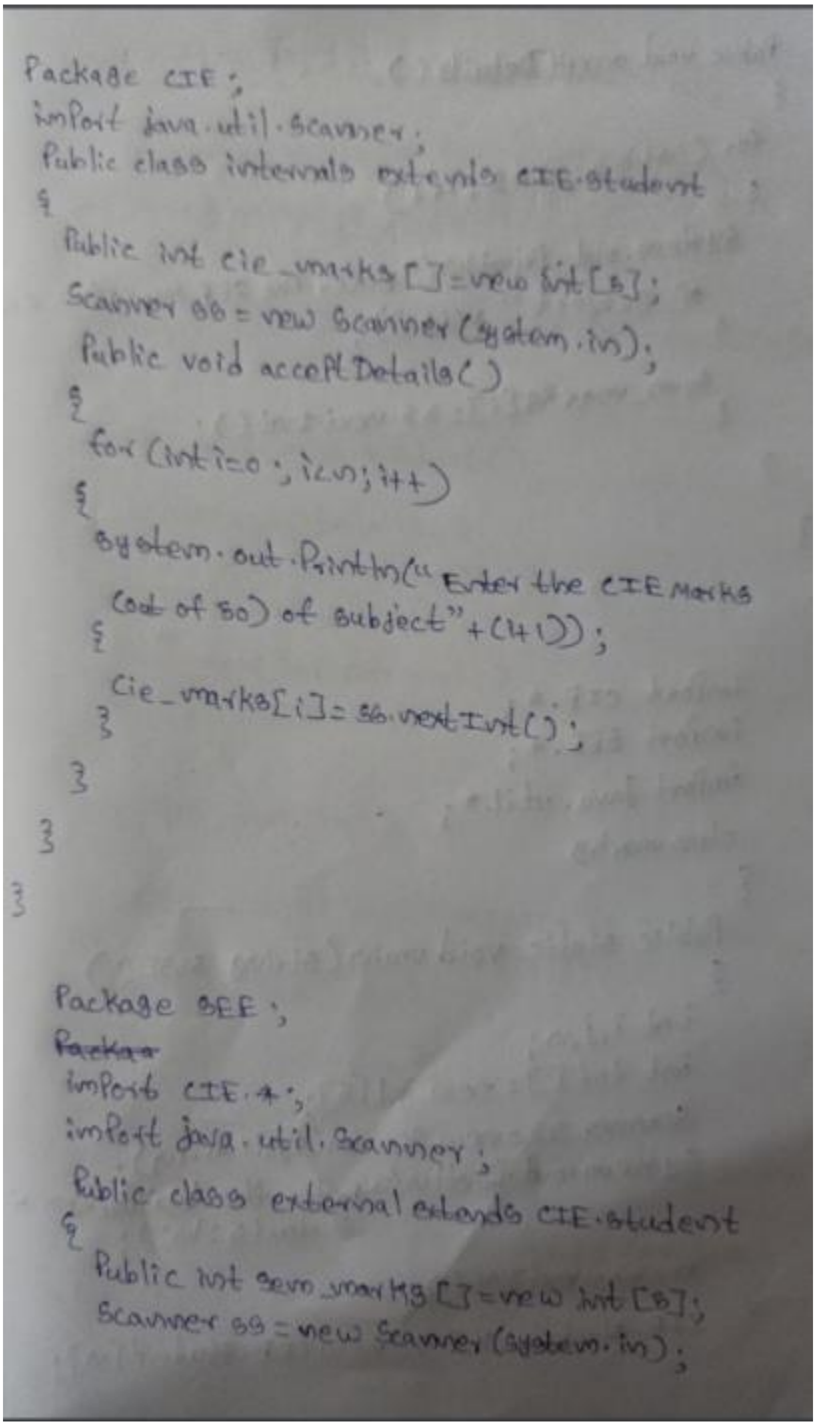
Lab-Program-6:

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.

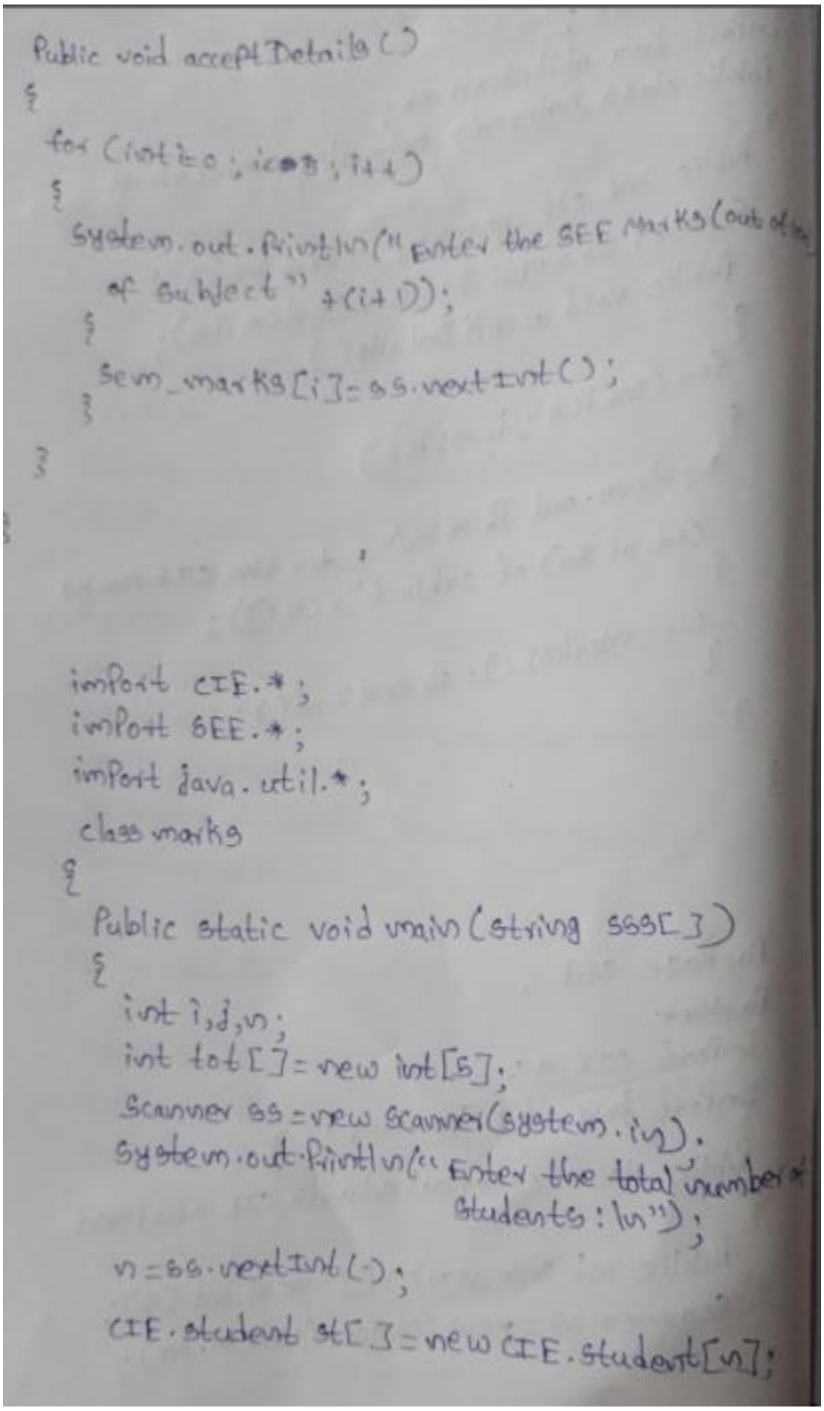


Lab-Program-6:

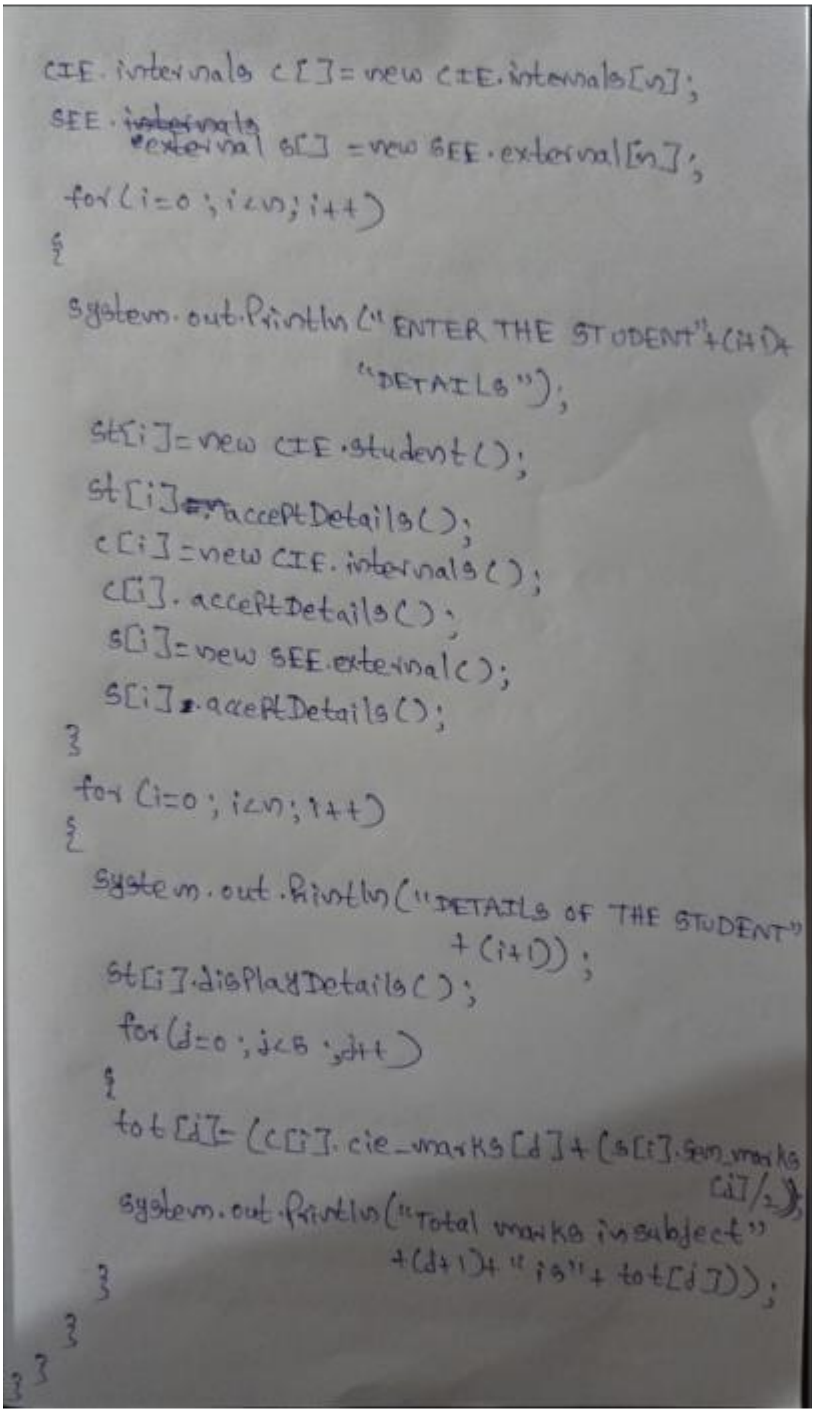
```
Package CIE;
import java.util.Scanner;
Public class Student
{
 int usn;
 String name;
 int sem;
 Scanner ss= new Scanner(system.in);
 Public void acceptDetails()
 {
 system.out.Println("Enter the Name: \n");
 name = ss.nextLine();
 system.out.Println("Enter the USN: \n");
 usn= ss.nextInt();
 system.out.Println("Enter the SEM: \n");
 sem= ss.nextInt();
 }
 Public void displayDetails()
 {
  system.out.Println("Name :"+name);
  system.out.Println("USN :"+usn);
  system.out.Println("SEM :"+sem);
 }
}
```



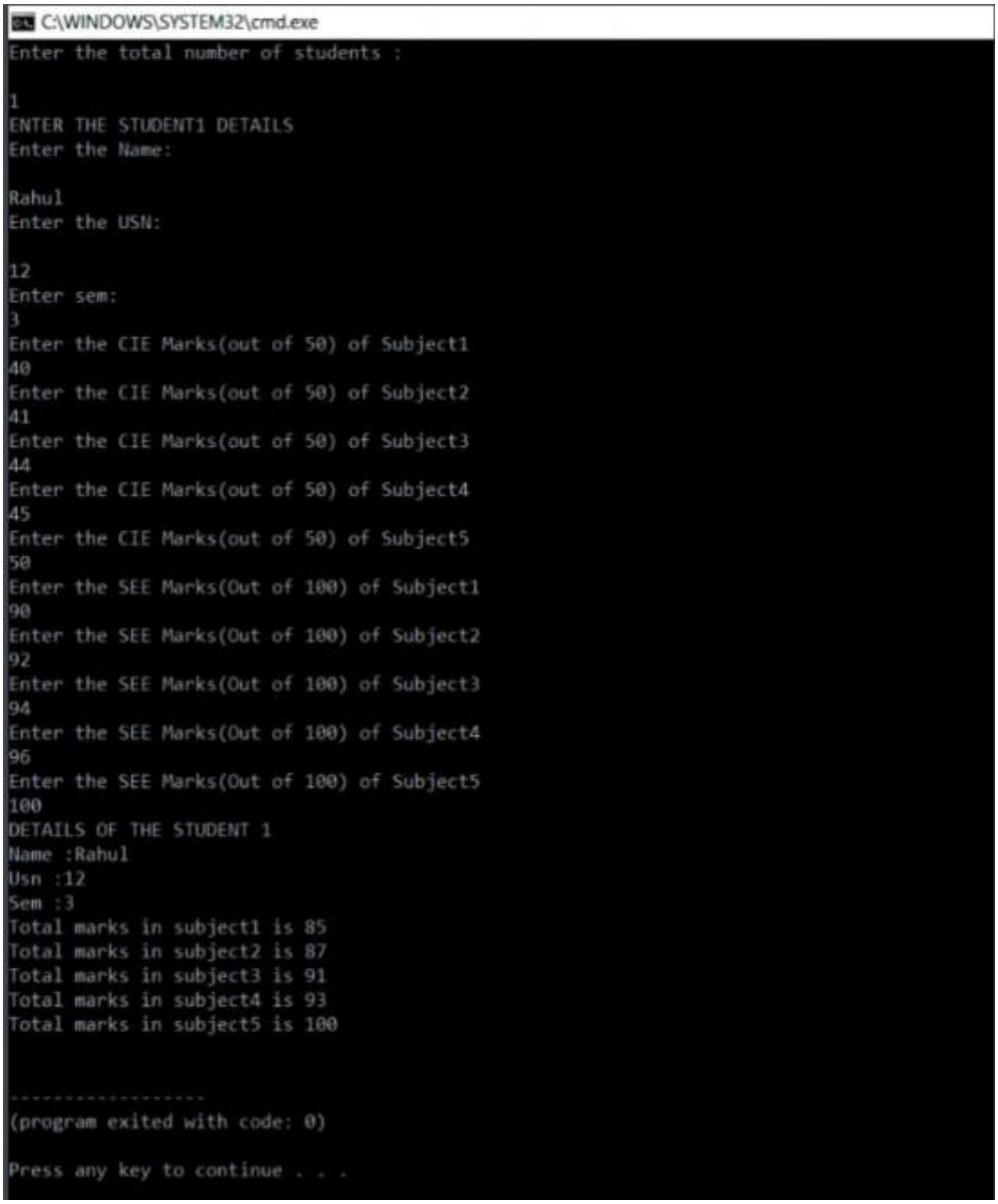
```
Package CIE ;
import java.util.scanner;
Public class internals extends CIE.student
{
  Public int cie_marks[]=new int[5];
  Scanner ss = new Scanner(system.in);
   Public void acceptDetails( )
  {
   for (int i=0 ; i<n; i++)
   {
    system.out.Println("Enter the CIE Marks
     (out of 50) of subject"+(i+1));
    {
     Cie_marks[i]= ss.nextInt();
    }
   }
  }
}


 Package SEE ;
 ~~Packa~~
  import CIE.* ;
  import java.util.Scanner;
   Public class external extends CIE.student
  {
   Public int sem_marks[]=new int[5];
   Scanner ss = new Scanner(system.in);
```



```
Public void acceptDetails()
{
 for (int i=0; i<5; i++)
 {
  System.out.Println(" Enter the SEE Marks(out of
    of subject " +(i+1));
  {
   sem_marks[i]=ss.nextInt();
  }
}
}


  import CIE.*;
  import SEE.*;
  import java.util.*;
  class marks
  {
   Public static void main(String sss[])
   {
    int i,j,n;
    int tot[]=new int[5];
    Scanner ss=new Scanner(system.in);
    System.out.Println(" Enter the total number of
                          Students:\n");
    n=ss.nextInt();
    CIE.student st[]=new CIE.student[n];
```



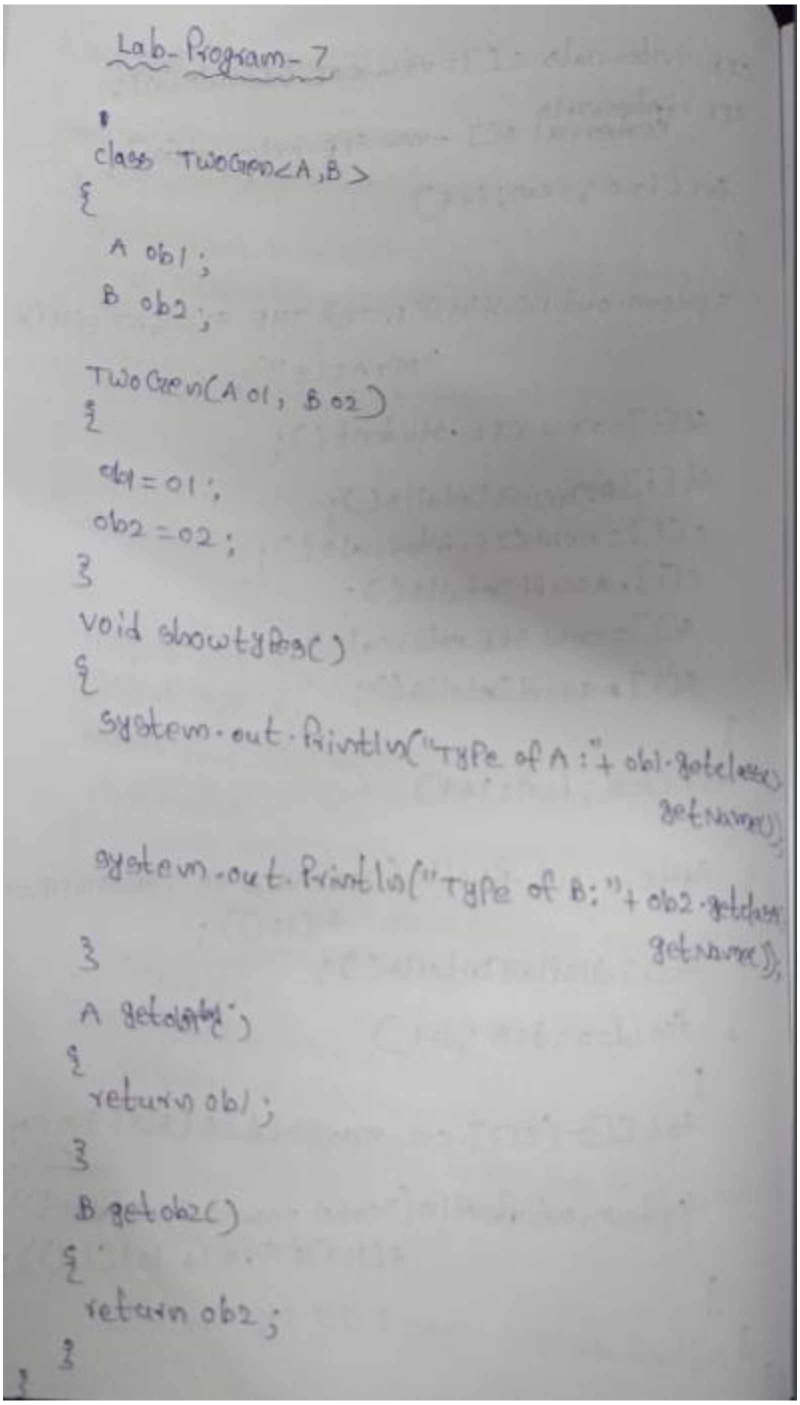
```
CIE.internals c[]=new CIE.internals[n];
SEE.~~internals~~
     external s[] =new SEE.external[n];
 for(i=0;i<n;i++)
{
 system.out.Println("ENTER THE STUDENT"+(i+1)+
                    "DETAILS");
  st[i]=new CIE.student();
  st[i]~~=~~.acceptDetails();
  c[i]=new CIE.internals();
  c[i].acceptDetails();
   s[i]=new SEE.external();
   s[i].acceptDetails();
 }
 for(i=0;i<n;i++)
{
  system.out.Println("DETAILS OF THE STUDENT"
                        +(i+1));
   st[i].displayDetails();
   for(d=0;d<8;d++)
   {
   tot[d]=(c[i].cie_marks[d]+(s[i].sem_marks
                                    [d]/2));
   system.out.Println("Total marks in subject"
                   +(d+1)+"is"+tot[d]));
   }
 }
}}
```



```
Enter the total number of students :

1
ENTER THE STUDENT1 DETAILS
Enter the Name:

Rahul
Enter the USN:

12
Enter sem:
3
Enter the CIE Marks(out of 50) of Subject1
40
Enter the CIE Marks(out of 50) of Subject2
41
Enter the CIE Marks(out of 50) of Subject3
44
Enter the CIE Marks(out of 50) of Subject4
45
Enter the CIE Marks(out of 50) of Subject5
50
Enter the SEE Marks(Out of 100) of Subject1
90
Enter the SEE Marks(Out of 100) of Subject2
92
Enter the SEE Marks(Out of 100) of Subject3
94
Enter the SEE Marks(Out of 100) of Subject4
96
Enter the SEE Marks(Out of 100) of Subject5
100
DETAILS OF THE STUDENT 1
Name :Rahul
Usn :12
Sem :3
Total marks in subject1 is 85
Total marks in subject2 is 87
Total marks in subject3 is 91
Total marks in subject4 is 93
Total marks in subject5 is 100


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

Press any key to continue . . .
```

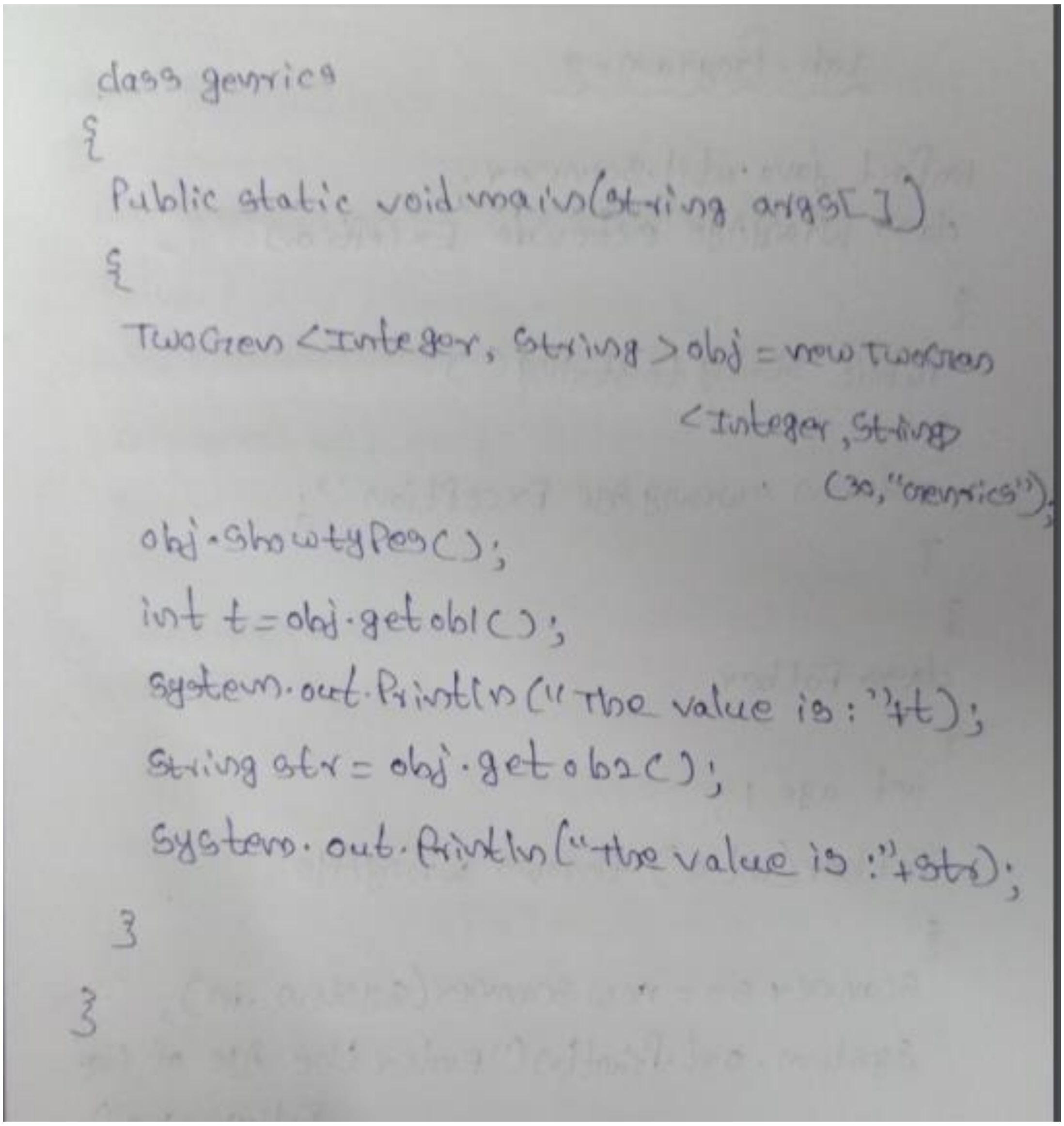
Lab-Program-7:

Write a program to demonstrate generics with multiple object parameters.

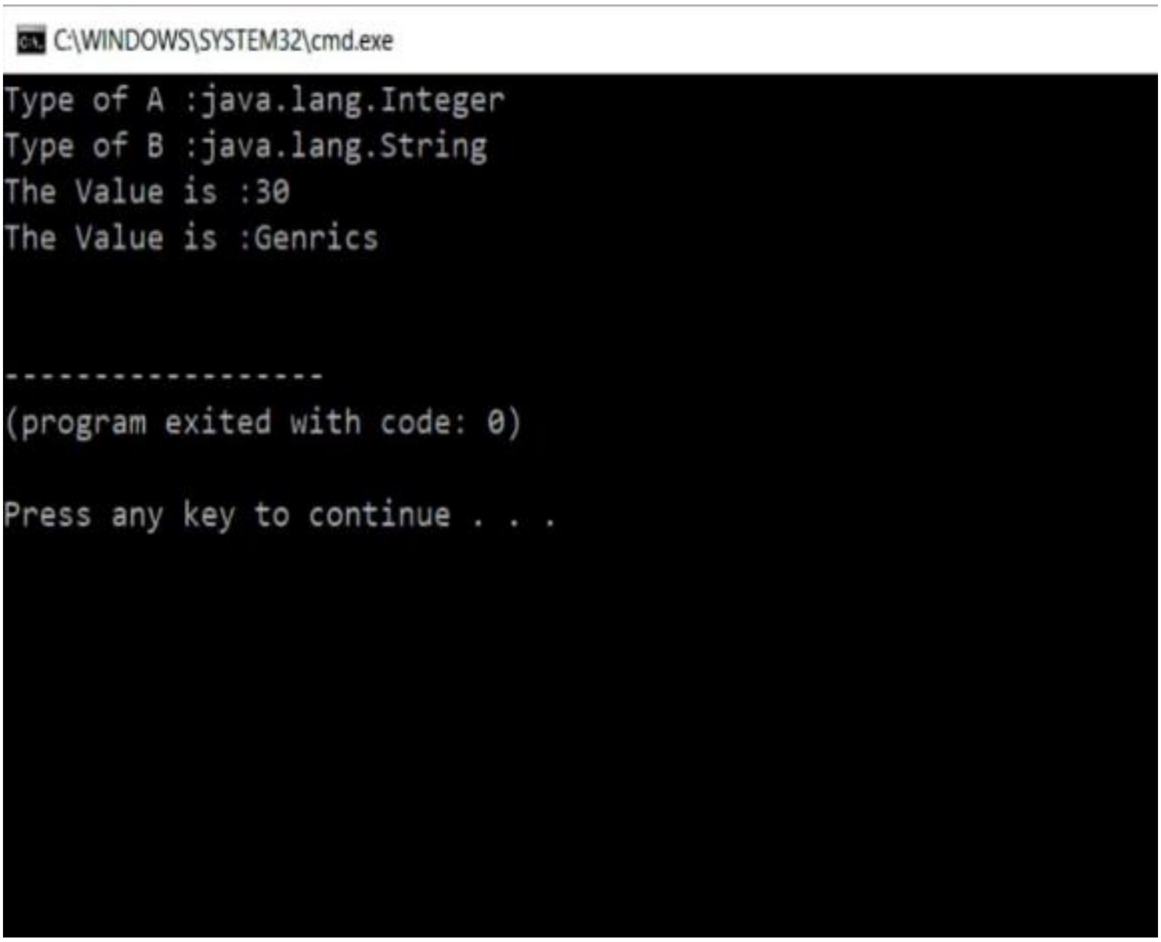


Lab-Program-7

```
class TwoGen<A,B>
{
 A ob1;
 B ob2;

TwoGen(A o1, B o2)
{
 ob1=o1;
 ob2=o2;
}
void showtypes()
{
 system.out.Println("Type of A:"+ ob1.getclass()
                                    getName());
 system.out.Println("Type of B:"+ ob2.getclass
                                    getName());
 }
 A getob1()
 {
 return ob1;
 }
 B getob2()
 {
 return ob2;
 }
}
```



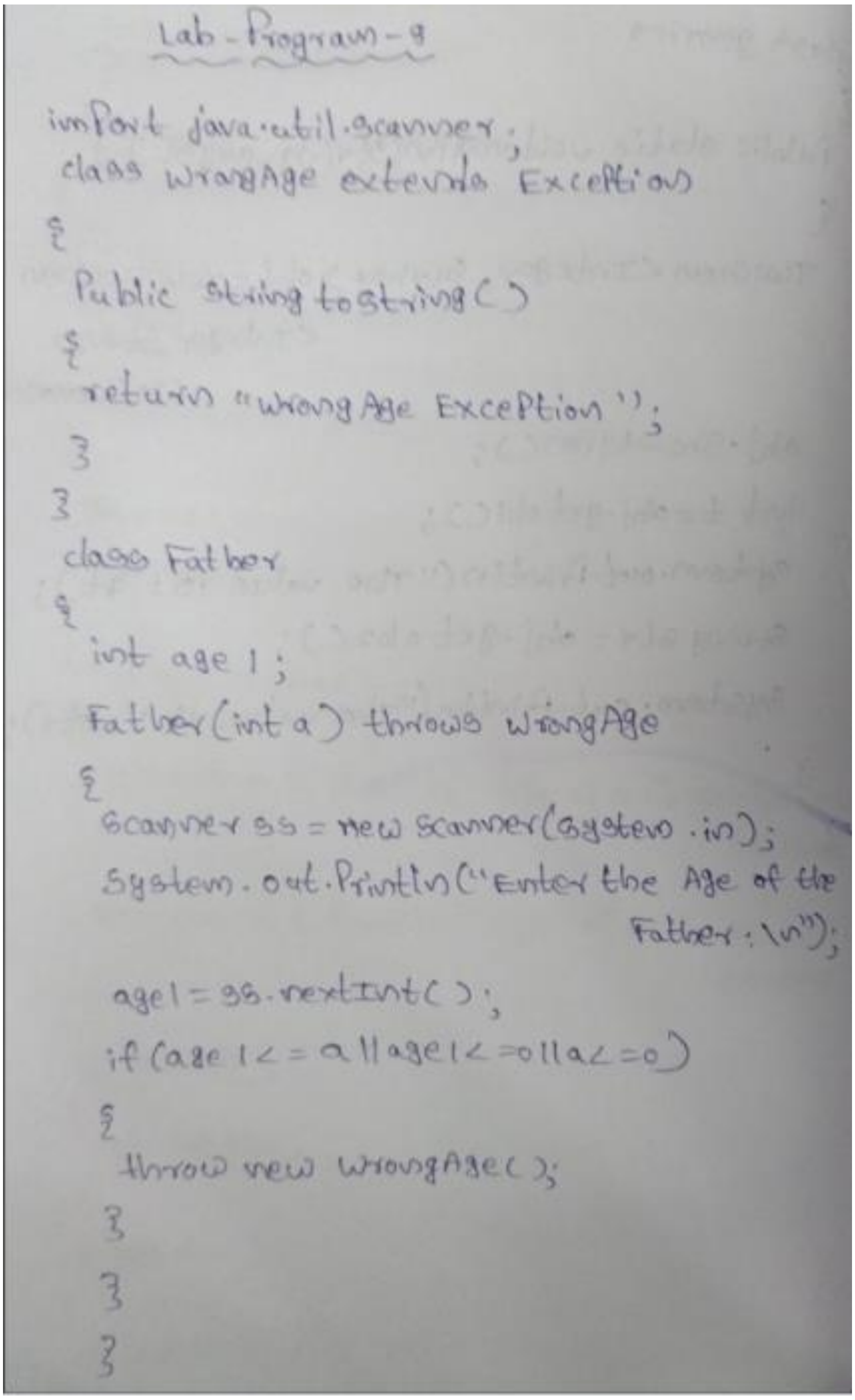
```
class genrics
{
 Public static void main(String args[])
 {
  TwoGen <Integer, String> obj = new TwoGen
                                    <Integer,String>
                                          (30,"Genrics");
  obj.showtypes();
  int t=obj.getob1();
  system.out.Println("The value is:"+t);
  String str = obj.getob2();
  System.out.Println("the value is :"+str);
 }
}
```



```
Type of A :java.lang.Integer
Type of B :java.lang.String
The Value is :30
The Value is :Genrics


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

Press any key to continue . . .
```

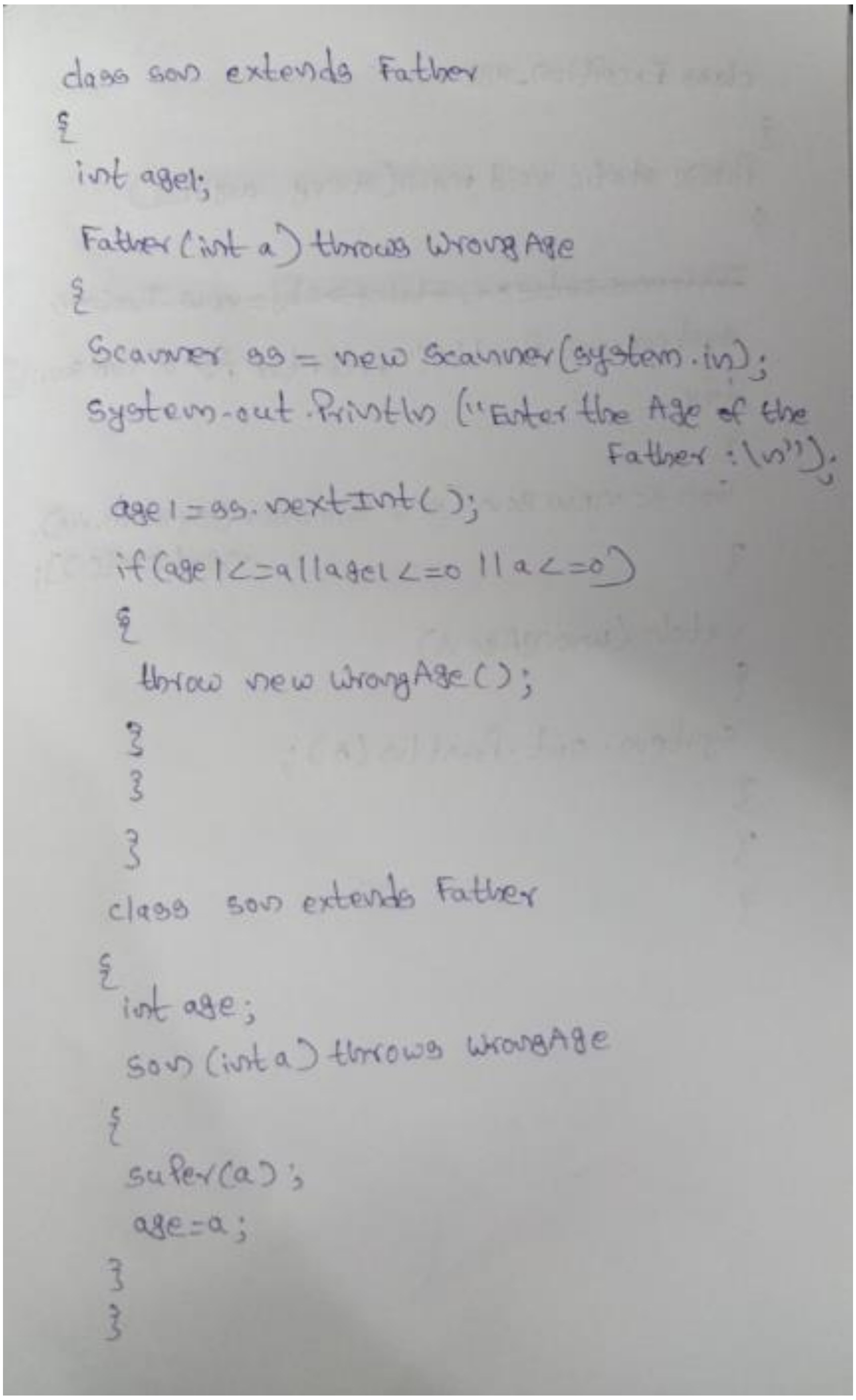
Lab-Program-8:

Write a program that demonstrates handling of exceptions in 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<0.In Son class,implement a constructor that cases both father and son’s age and throws an exception if son’s age is >=father’s age.

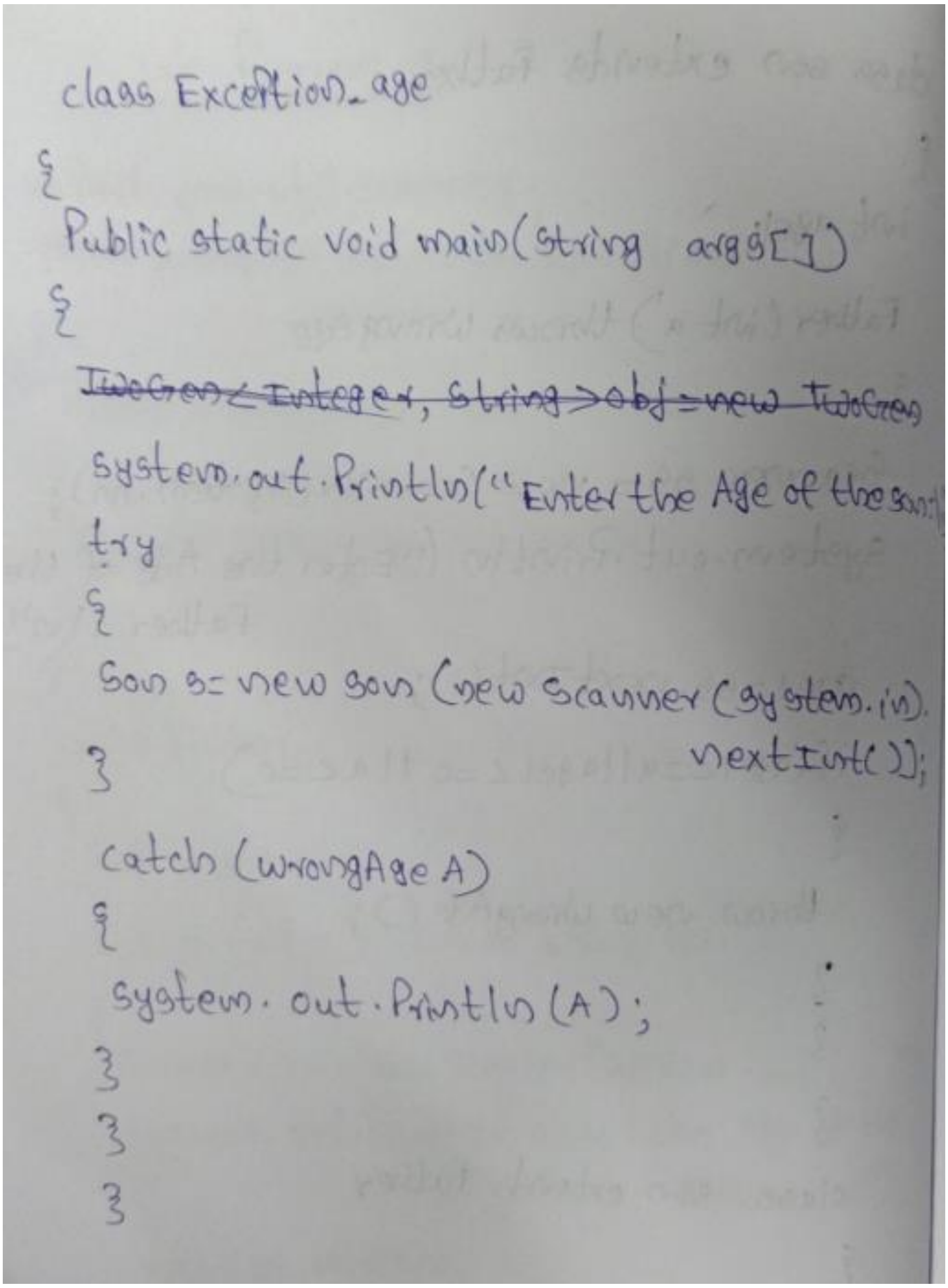


Lab - Program - 9

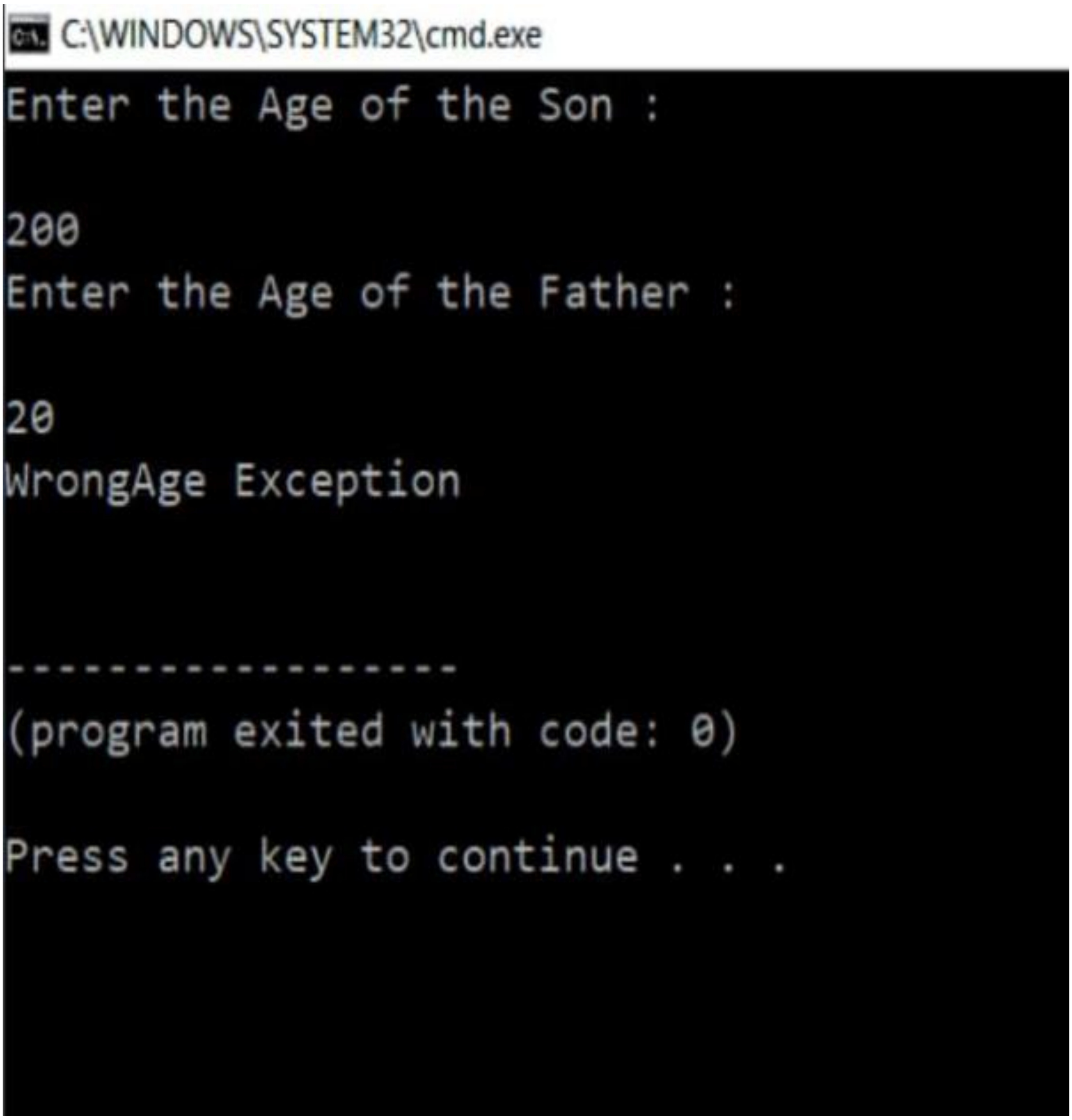
```
imPort java.util.scanner;
class wrangAge extends ExcePtion
{
 Public string tostring()
 {
  return "wrong Age ExcePtion";
 }
}
class Father
{
  int age1;
  Father(int a) throws wrongAge
  {
   Scanner ss = new Scanner(System.in);
   System.out.Println("Enter the Age of the
                                  Father:\n");
   age1=ss.nextInt();
   if(age1<=a||age1<=0||a<=0)
   {
    throw new wrongAge();
   }
  }
}
```



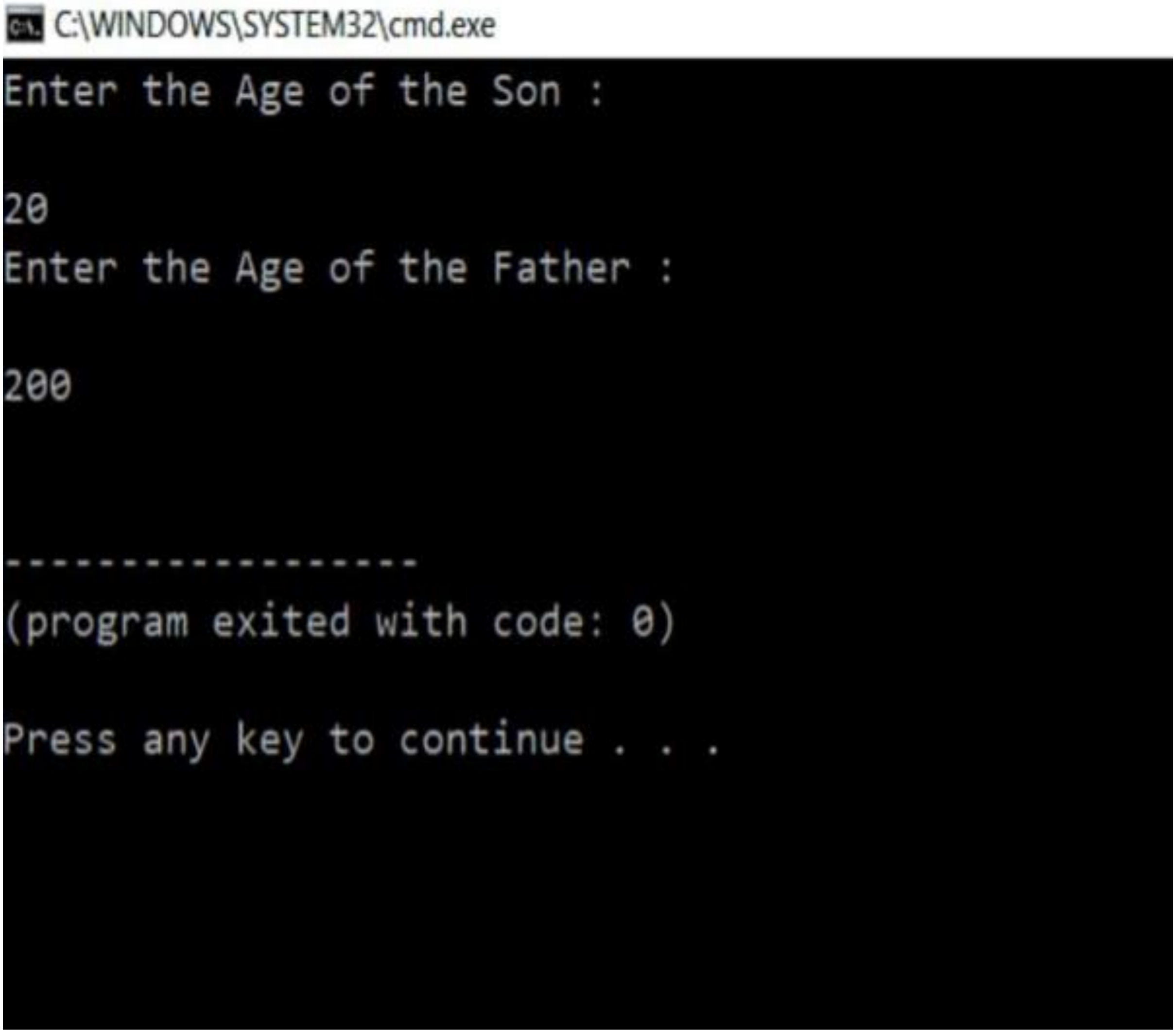
```
class son extends Father
{
 int age1;
 Father(int a) throws WrongAge
 {
  Scanner ss = new Scanner(system.in);
  system-out.Println ("Enter the Age of the
                                  Father :\n");
   age1=ss.nextInt();
   if(age1<=a||age1<=0 ||a<=0)
    {
     throw new WrongAge();
    }
   }
  }
 class son extends Father
 {
  int age;
  son (int a) throws WrongAge
 {
  super(a);
  age=a;
 }
 }
```



```
class Exception_age
{
 Public static void main(string args[])
 {
  ~~TwoGen<Integer, String>obj=new TwoGen~~
  system.out.Println("Enter the Age of the son
  try
  {
   Son s= new son (new Scanner (system.in).
                                  nextInt());
  }
  catch (wrongAge A)
  {
   system. out. Println (A);
  }
  }
  }
```

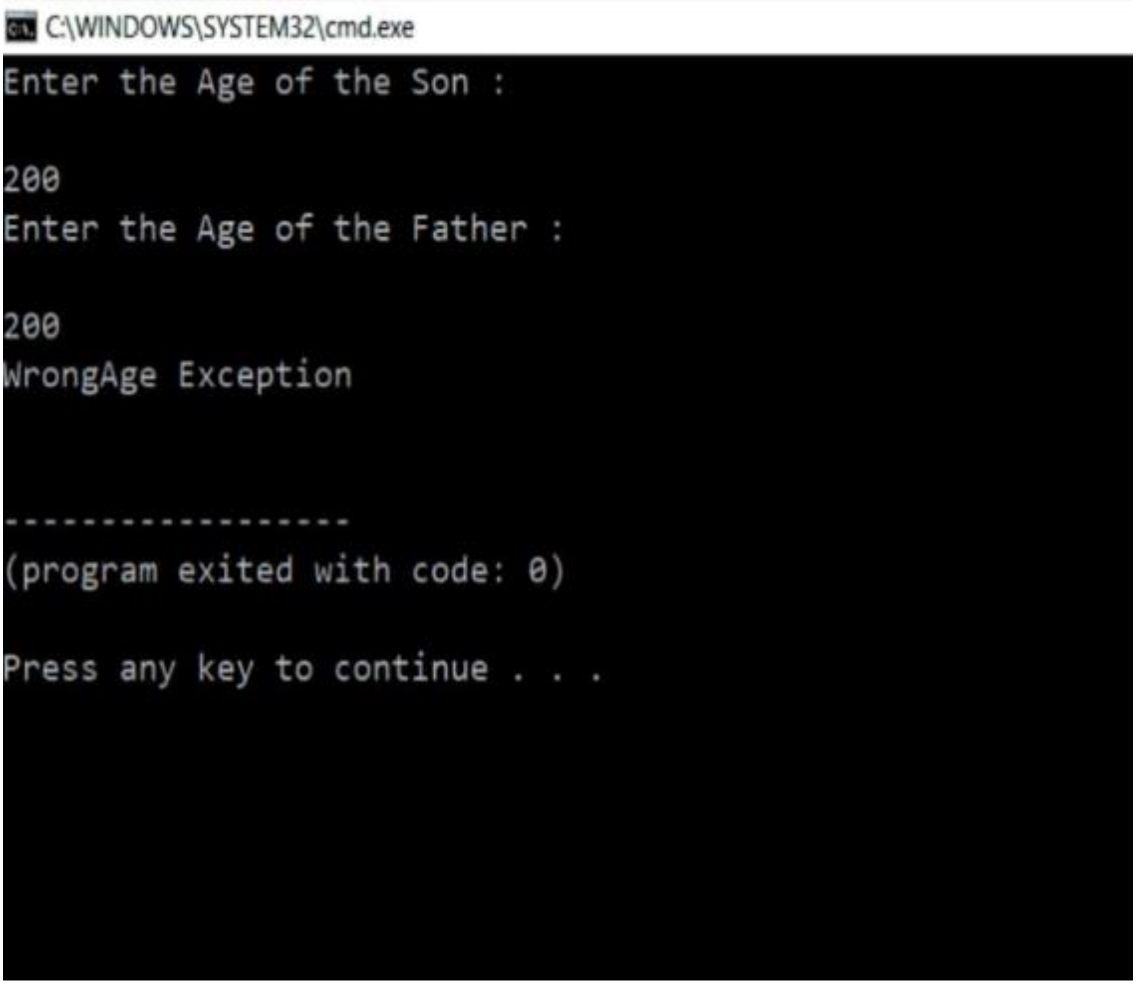


```
Enter the Age of the Son :

200
Enter the Age of the Father :

20
WrongAge Exception



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

Press any key to continue . . .
```



C:\WINDOWS\SYSTEM32\cmd.exe

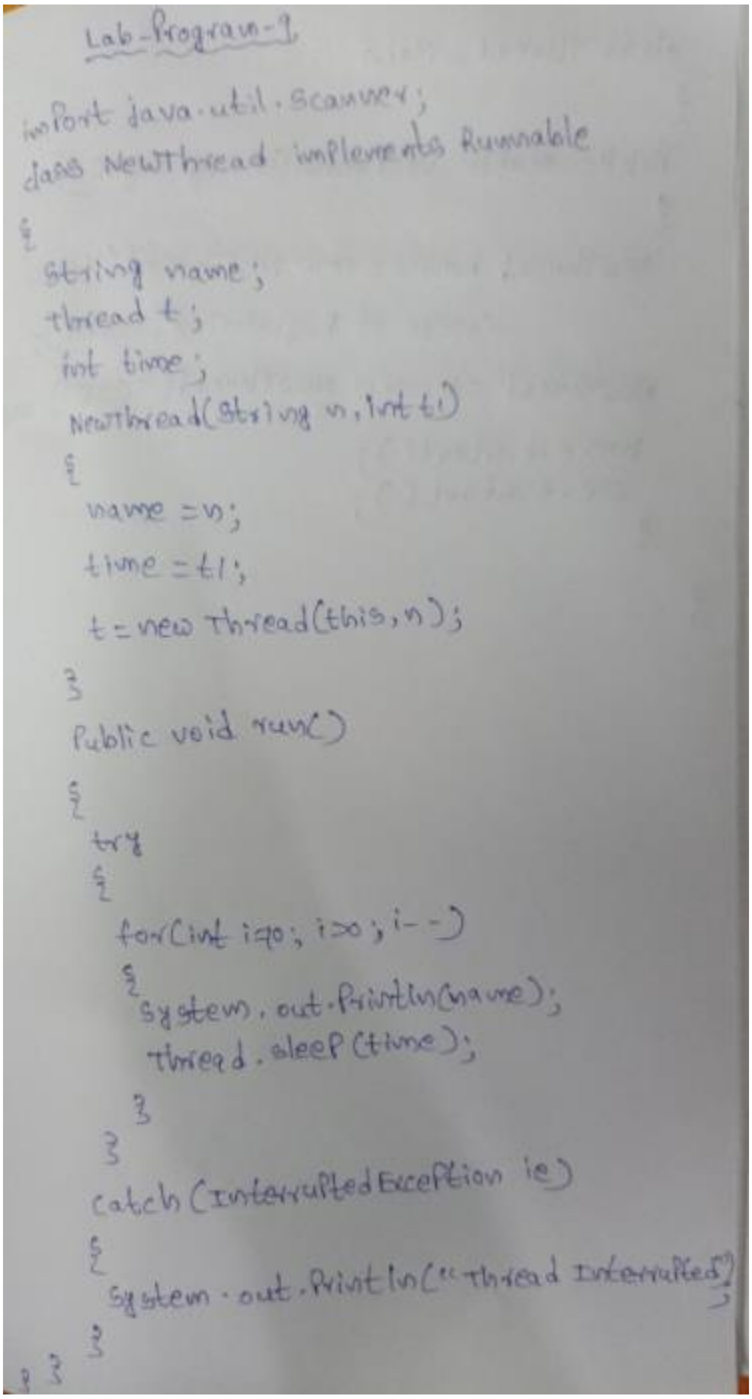
```
Enter the Age of the Son :

20
Enter the Age of the Father :

200



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

Press any key to continue . . .
```



```
Enter the Age of the Son :

200
Enter the Age of the Father :

200
WrongAge Exception



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

Press any key to continue . . .
```

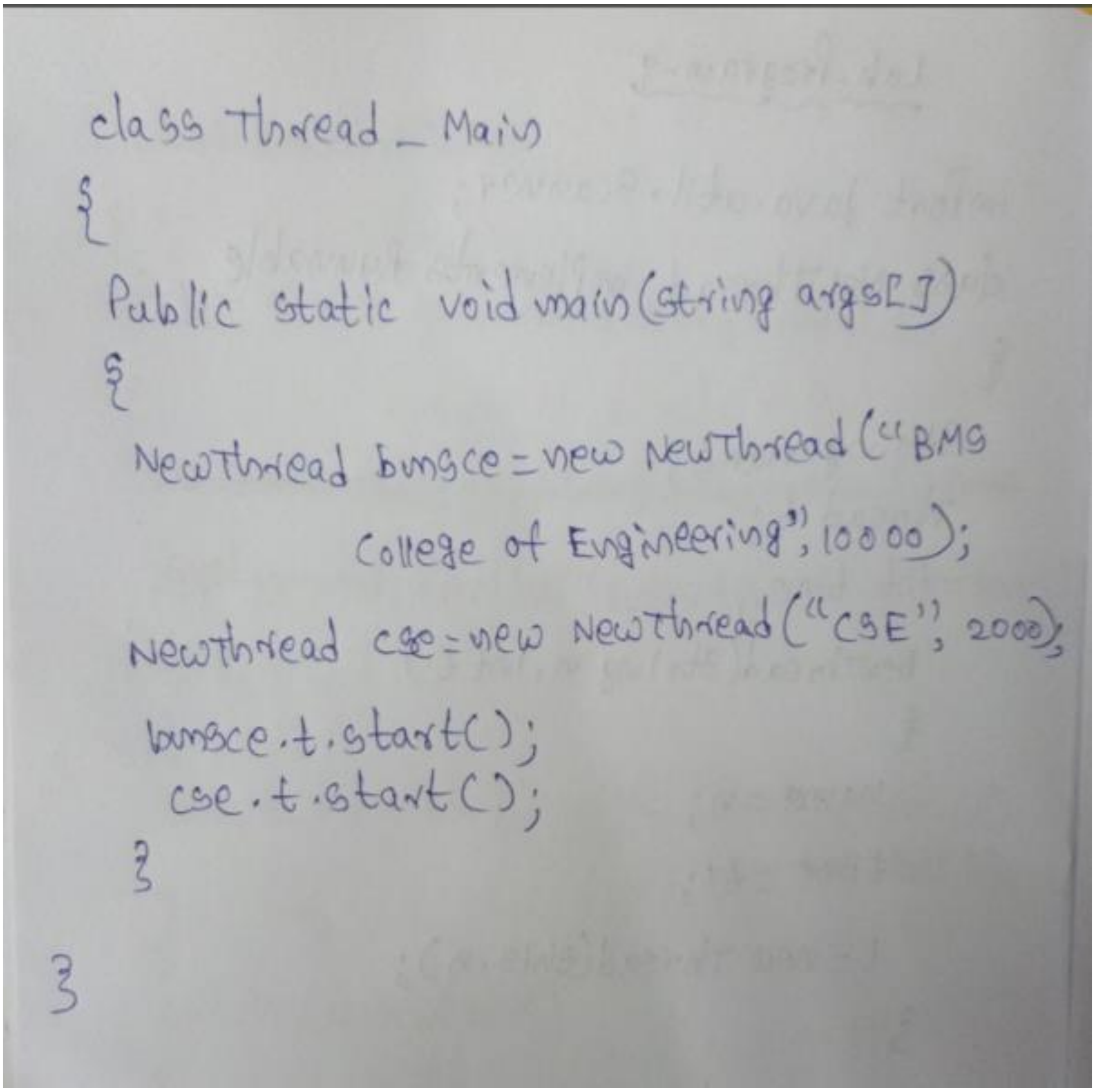
Lab-Program-9:

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.

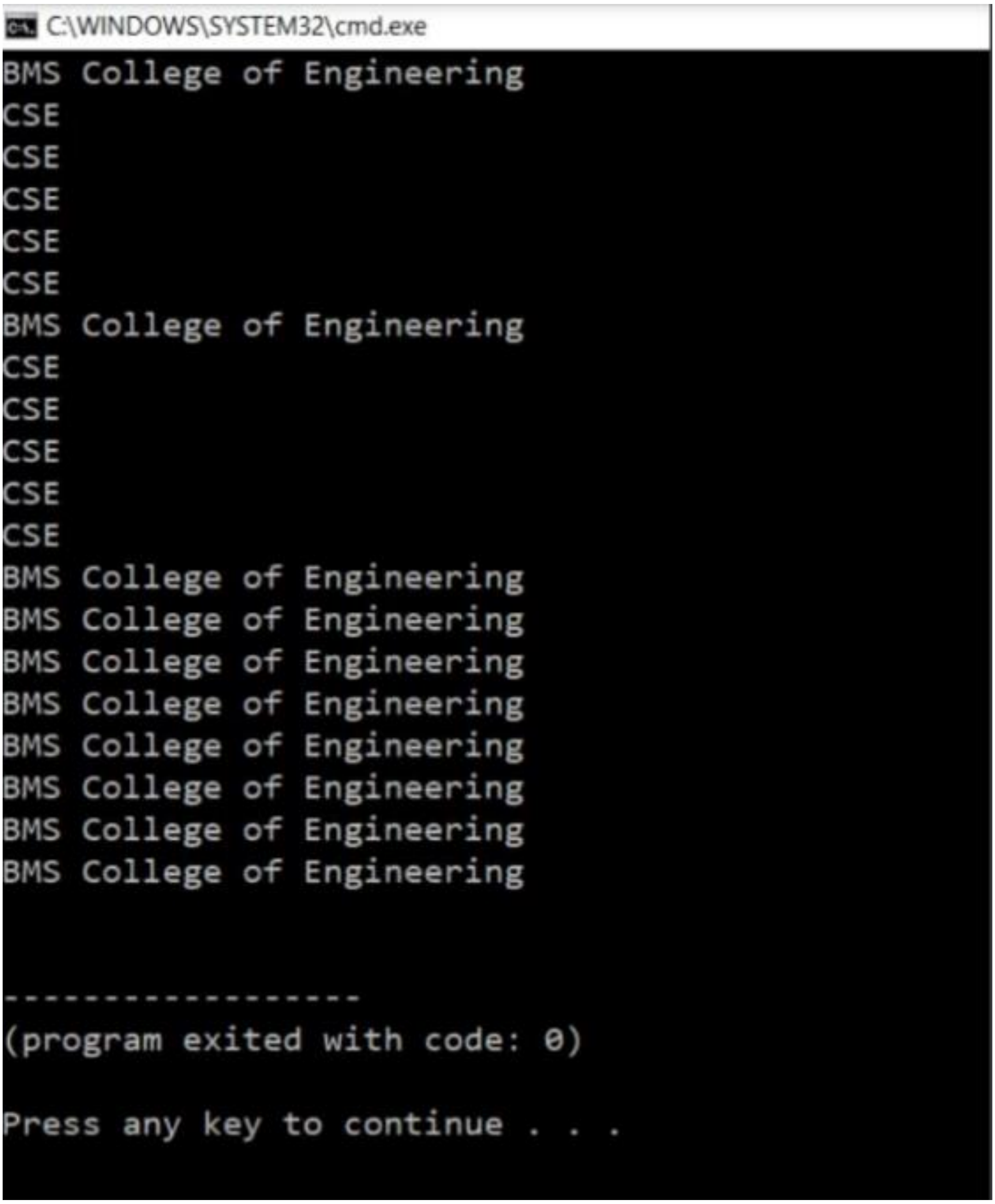


Lab-Program-9

```
import java.util.Scanner;
class NewThread implements Runnable
{
 String name;
 thread t;
  int time;
  NewThread(String n, int t1)
  {
   name = n;
   time = t1;
   t = new Thread(this, n);
  }
  Public void run()
  {
   try
   {
    for(int i=10; i>0; i--)
    {
     system.out.Println(name);
     thread.sleep(time);
    }
   }
   catch(InterruptedException ie)
   {
    System.out.Println("Thread Interrupted");
   }
} }
```



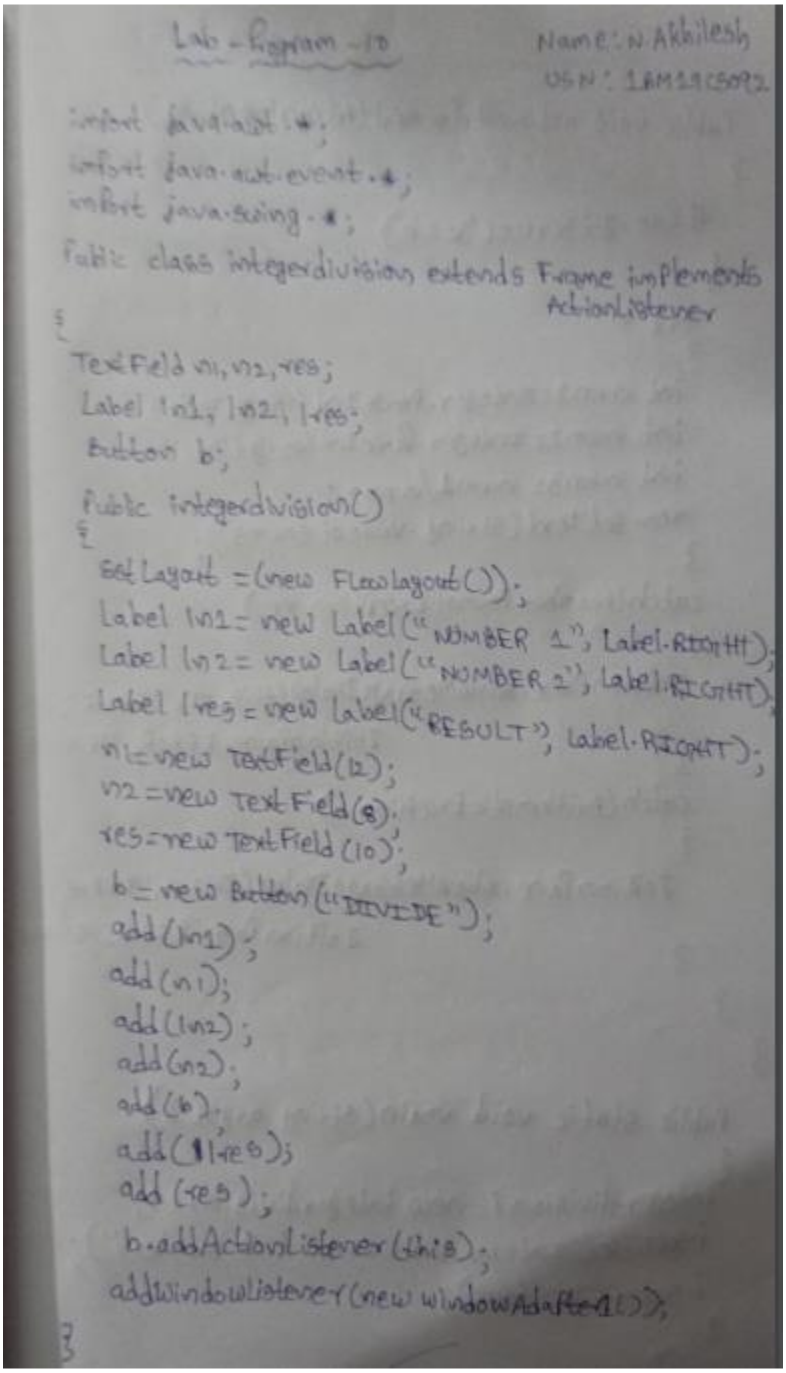
```
class Thread_Main
{
 Public static void main(String args[])
 {
  NewThread bmsce=new NewThread("BMS
             College of Engineering", 10000);
  Newthread cse=new Newthread("CSE", 2000),
  bmsce.t.start();
   cse.t.start();
  }
}
```



```
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering
BMS College of Engineering


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

Press any key to continue . . .
```

Lab-Program-10:

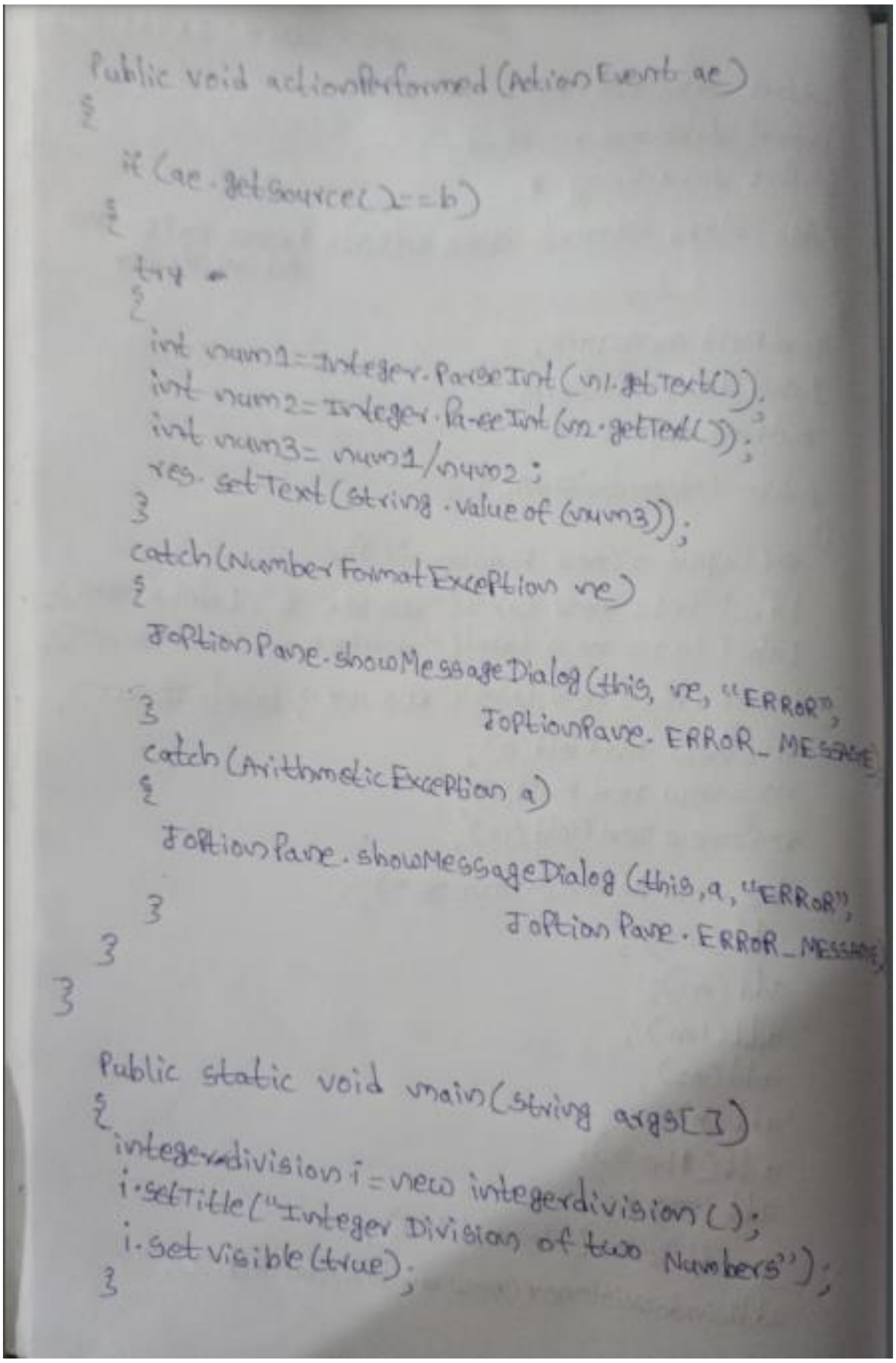
Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a NumberFormatException.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



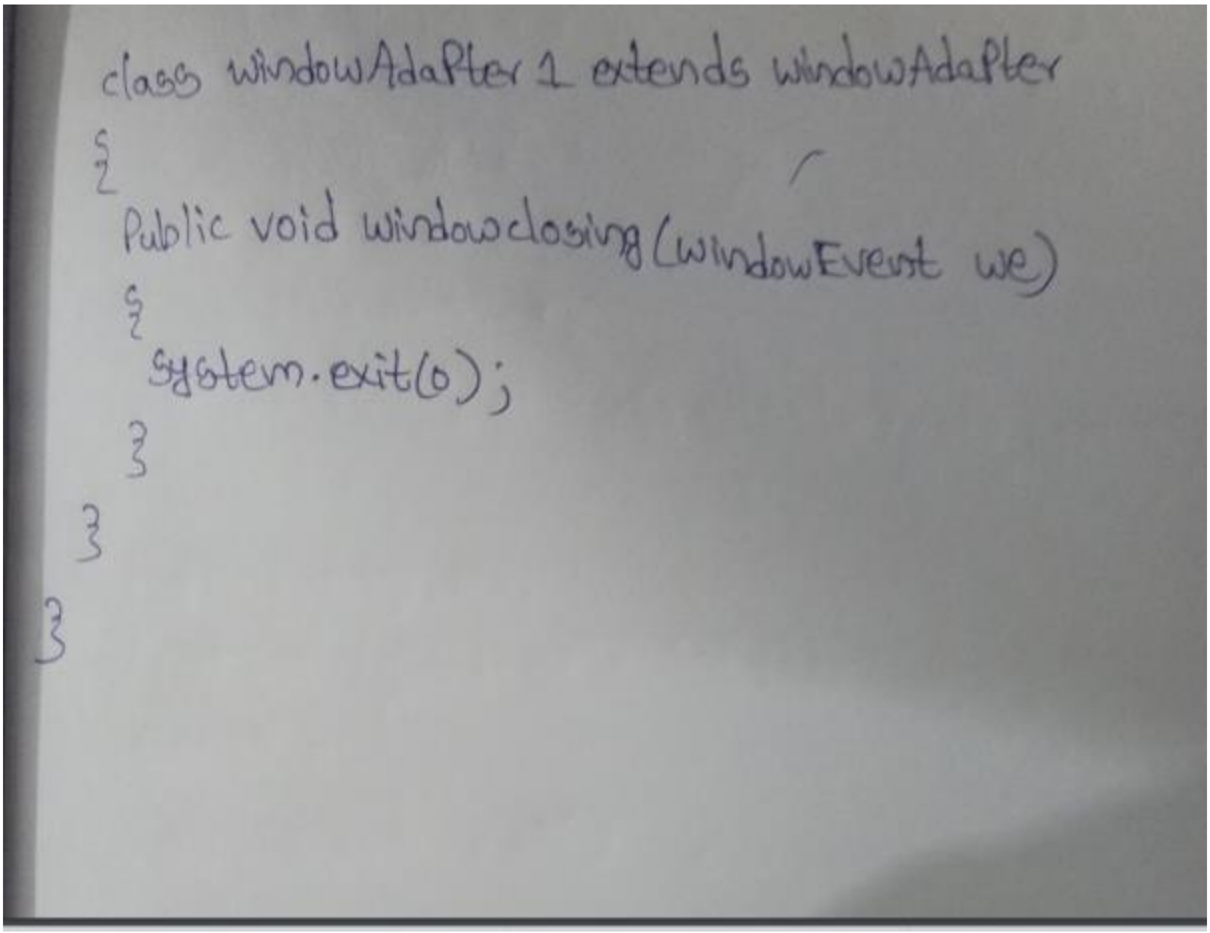
Lab - Program - 10

Name: N Akhilesh
USN: 1BM19CS092

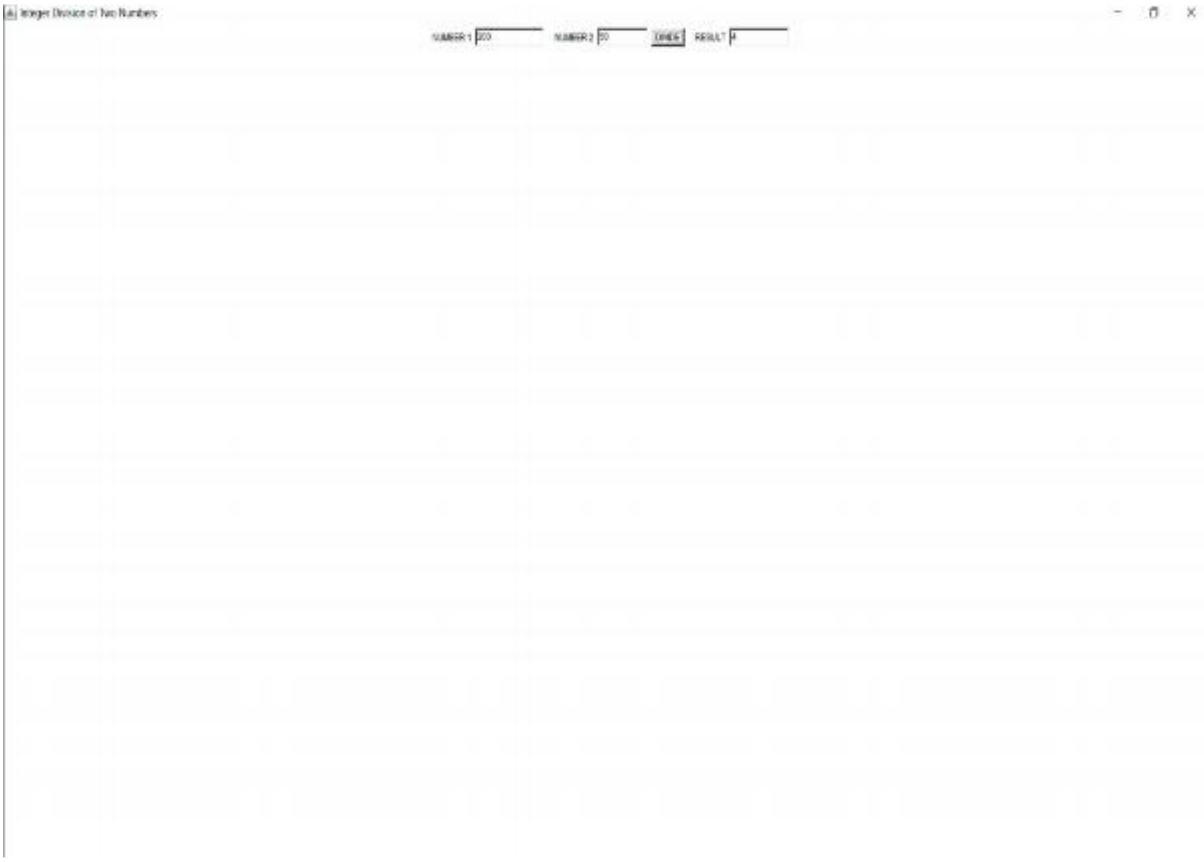
```
import java.awt.*;
import java.awt.event.*;
import java.swing.*;
public class integerdivision extends Frame implements
                                        ActionListener
{
 TextField n1,n2,res;
  Label ln1, ln2, lres;
  Button b;
  public integerdivision()
  {
   setLayout =(new FlowLayout());
   Label ln1= new Label("NUMBER 1", Label.RIGHT);
   Label ln2= new Label("NUMBER 2", label.RIGHT);
   Label lres = new label("RESULT", label.RIGHT);
   n1=new TextField(12);
   n2=new TextField(8);
   res=new TextField(10);
    b=new Button("DIVIDE");
    add(ln1);
    add(n1);
    add(ln2);
    add(n2);
    add(b);
    add(lres);
    add(res);
     b.addActionListener(this);
    addWindowListener(new WindowAdapter1());
}
```



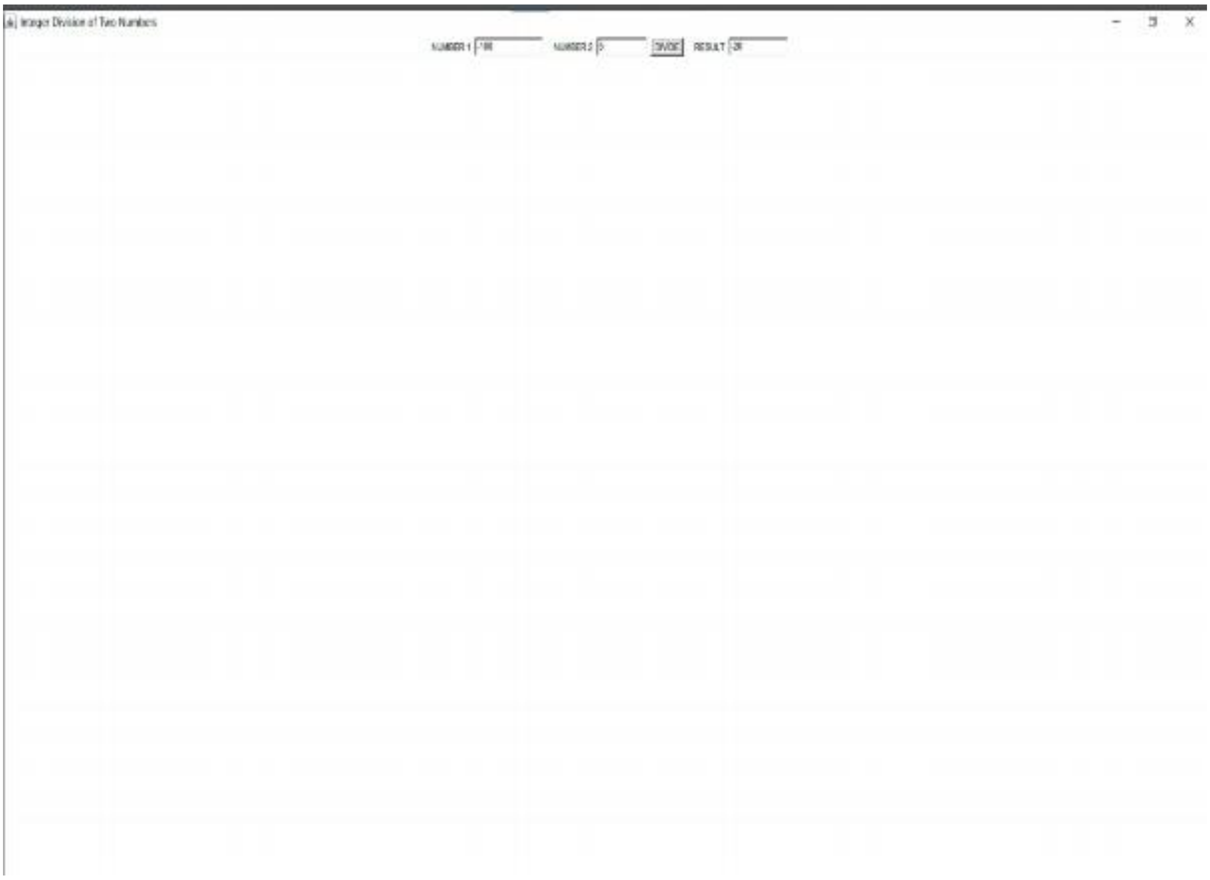
```
Public void actionPerformed(ActionEvent ae)
{
  if (ae.getSource()==b)
  {
   try
   {
    int num1=Integer.ParseInt(n1.getText());
    int num2=Integer.ParseInt(n2.getText());
    int num3= num1/num2;
    res.setText(String.valueof(num3));
   }
   catch(NumberFormatException ne)
   {
    JOptionPane.showMessageDialog(this, ne, "ERROR",
                          JOptionPane.ERROR_MESSAGE
    }
    catch(ArithmeticException a)
    {
     JOptionPane.showMessageDialog(this,a,"ERROR",
                          JOption Pane.ERROR_MESSAGE
    }
  }
}

 Public static void main(String args[])
 {
  integerdivision i=new integerdivision();
  i.setTitle("Integer Division of two Numbers");
  i.setVisible(true);
 }
```



```
 class windowAdapter 1 extends windowAdapter
 {
  Public void windowclosing(WindowEvent we)
  {
   system.exit(0);
  }
 }
}
```

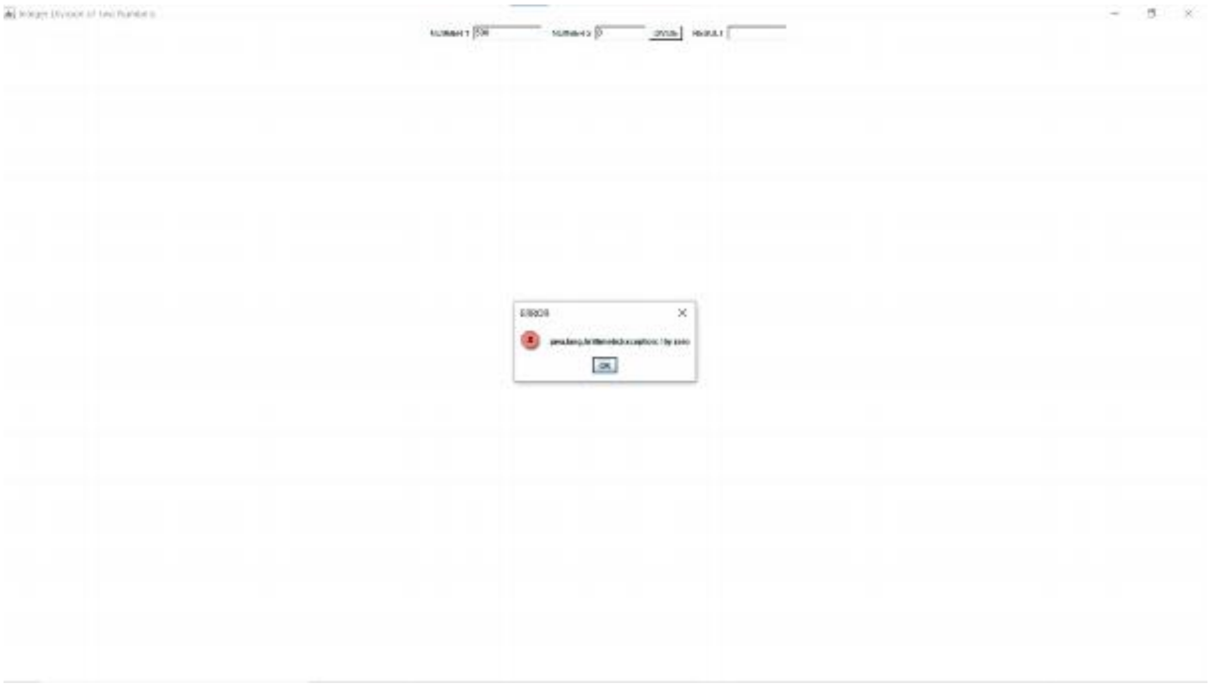


NUMBER 1 200 NUMBER 2 50 RESULT 4



Integer Division of Two Numbers

NUMBER 1 -100 NUMBER 2 5 RESULT -20



Integer Division of two Numbers

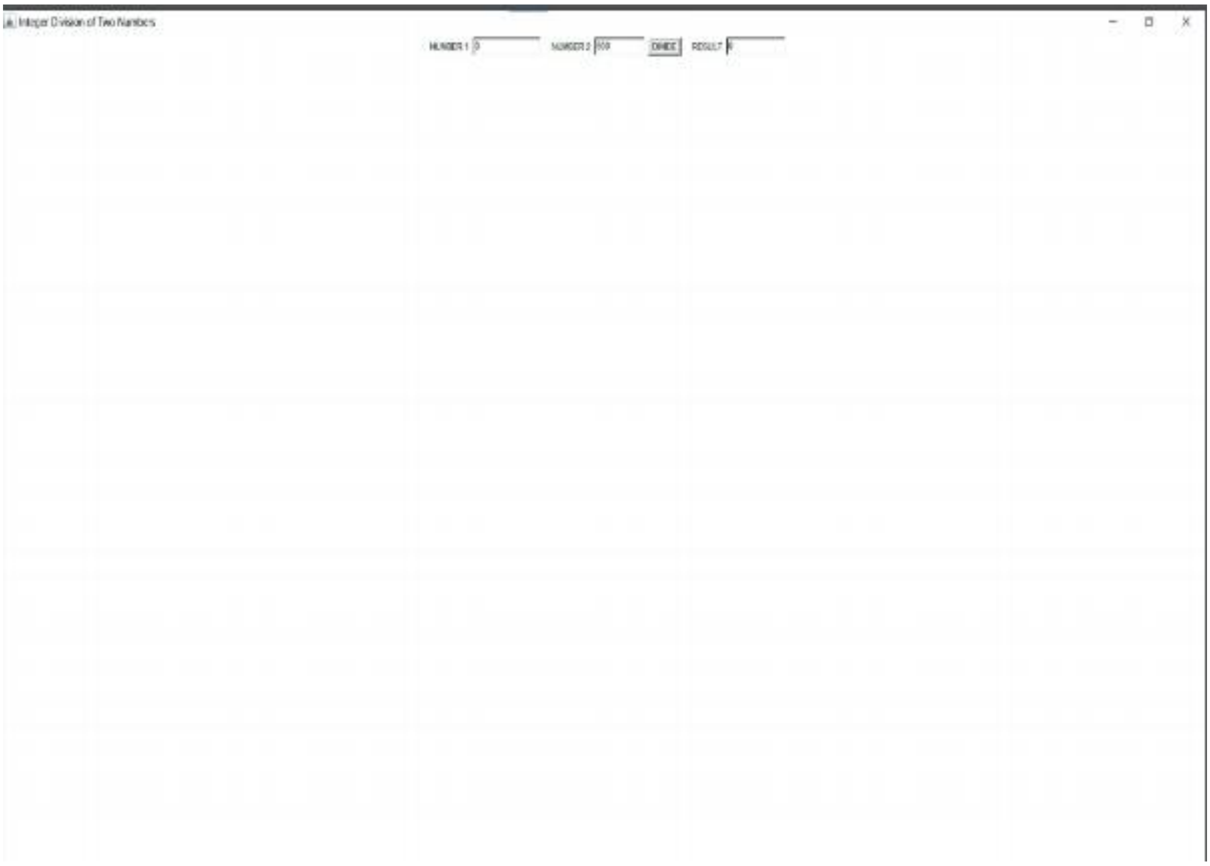
NUMBER 1 536

NUMBER 2 0

RESULT

ERROR

java.lang.ArithmeticException: / by zero



Integer Division of Two Numbers

NUMBER 1 0

NUMBER 2 100

RESULT 0