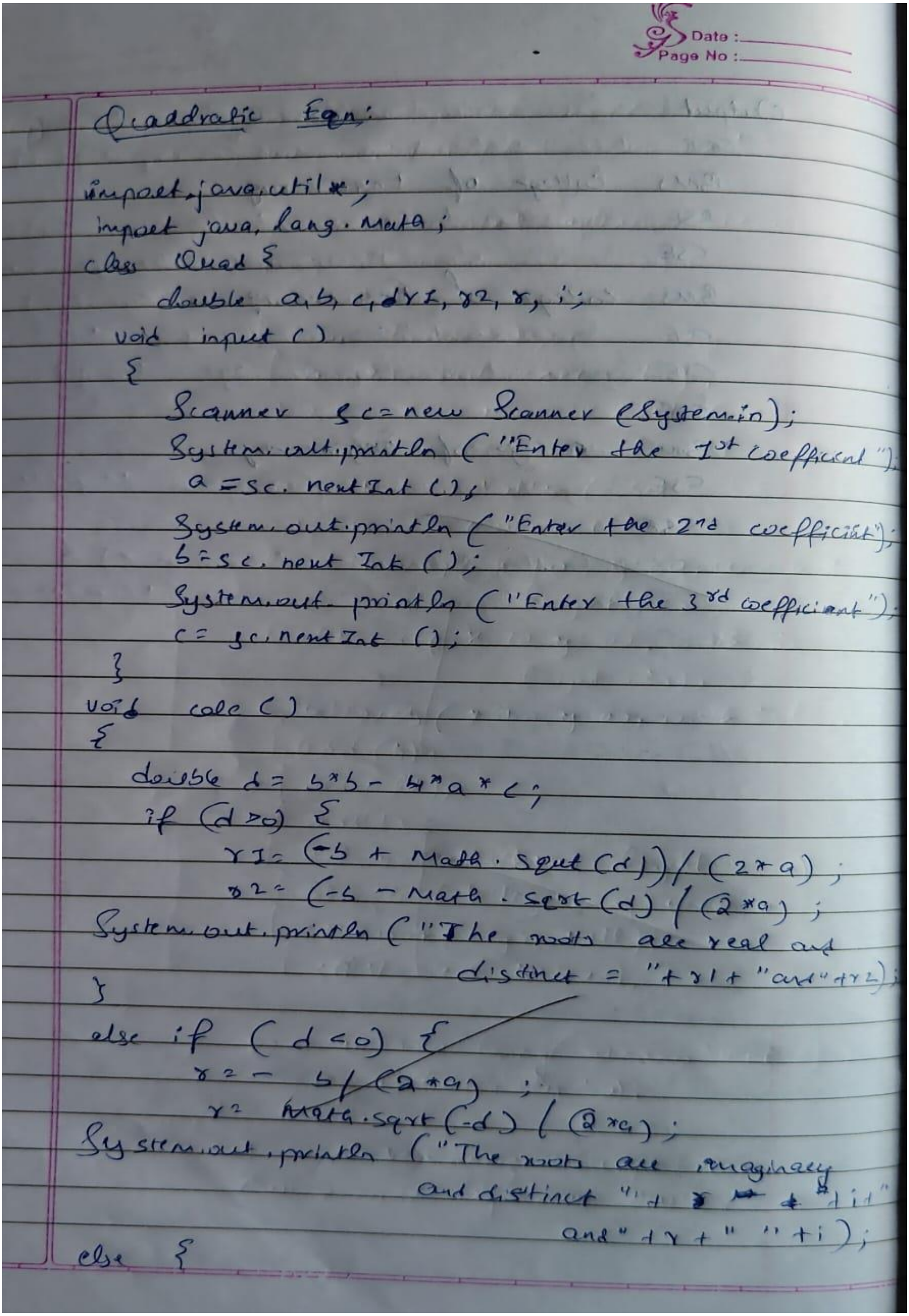

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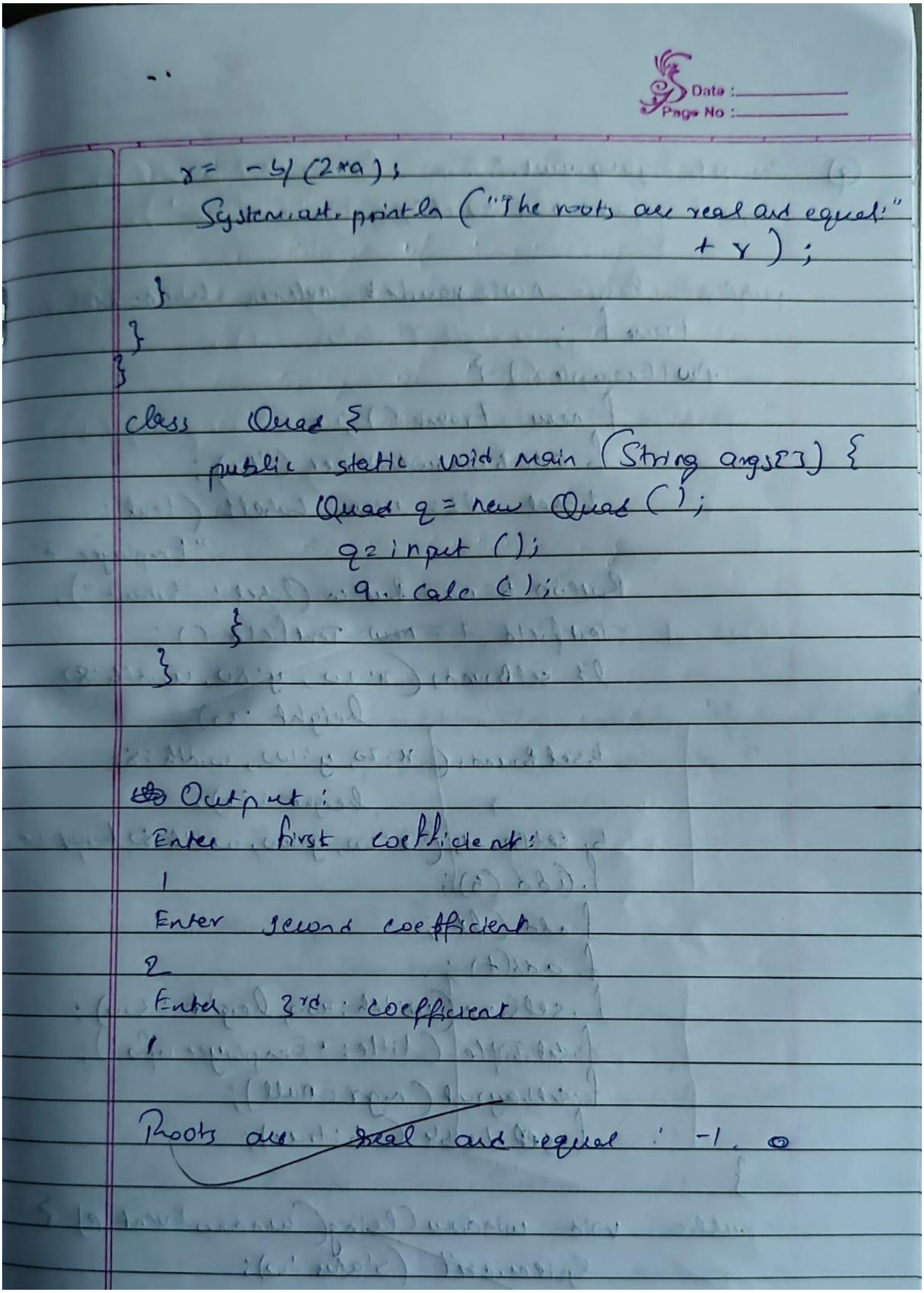
Quadratic Eqn:

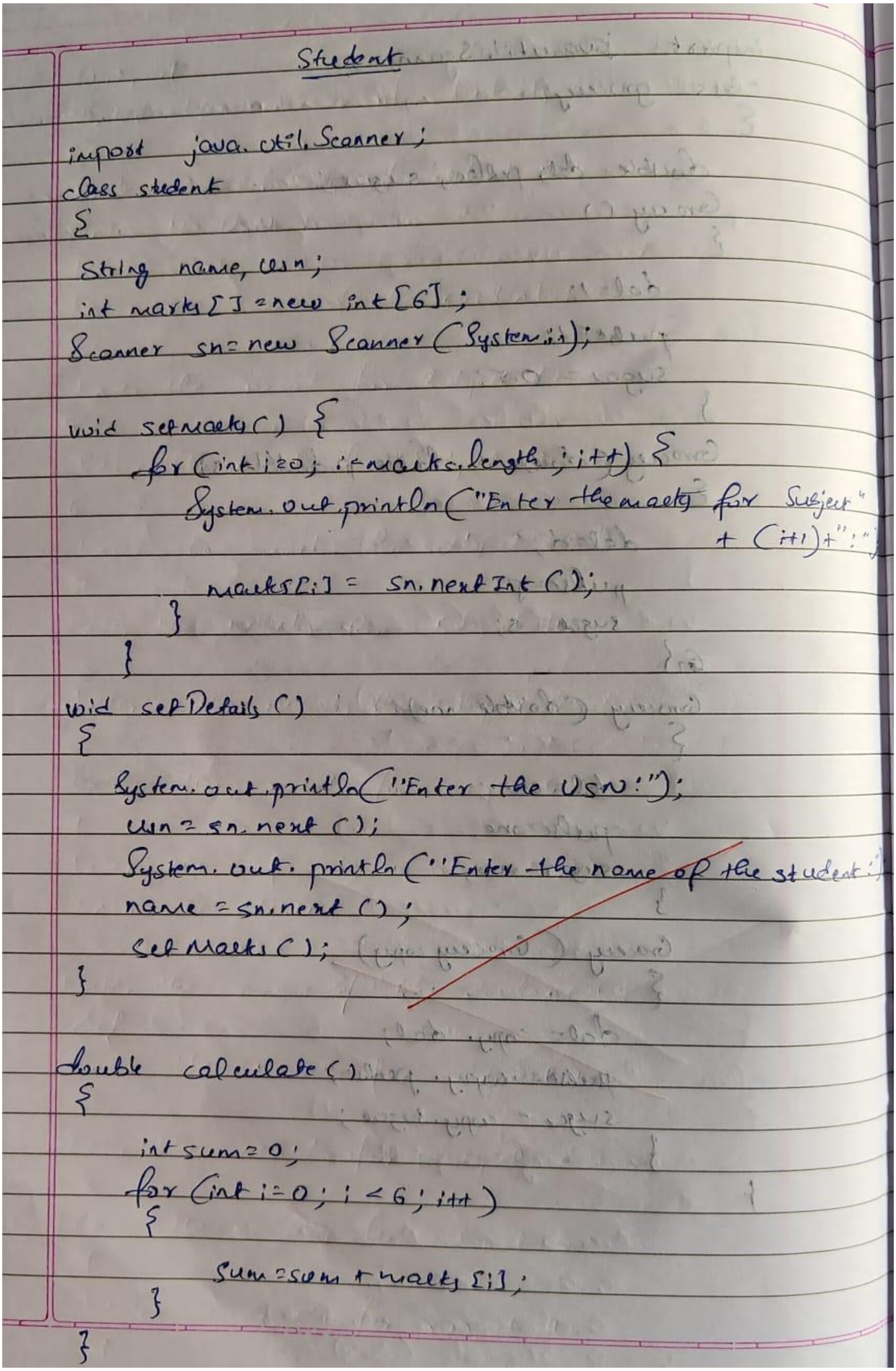
```
import java.util*;
impoet java.lang.Math;
class Quad {
    double a,b,c,dr1,r2,r,i;
  void input ()
  {
     Scanner sc=new Scanner (System.in);
     System.out.println ("Enter the 1st coefficent");
      a =sc.nextInt ();
     System.out.println ("Enter the 2nd coefficint");
     b=sc.next Int ();
     System.out.println ("Enter the 3rd coefficiant");
     c= sc.nextInt ();
  }
void calc ()
{
   double d= b*b - 4*a*c;
   if (d>0) {
       r1= (-b + Math.sqrt(d))/(2*a);
       r2= (-b - Math.sqrt(d)/(2*a);
System.out.println ("The roots are real and
                  distinct = "+r1+"and"+r2);
}
else if (d<0) {
       r2 - b/(2*a);
       r2 Math.sqrt(-d)/(2*a);
System.out.println ("The roots are imaginary
                and distinct "+r+"+i"
                        and"+r+" "+i);
else {
```



```
   r= -b/(2*a);
     System.out.println ("The roots are real and equal:"
                                        + r );
  }
 }
}
class  Quad {
    public  static  void main (String args[]) {
           Quad q = new Quad ();
           q.input ();
           q.calc ();
      }
  }
```

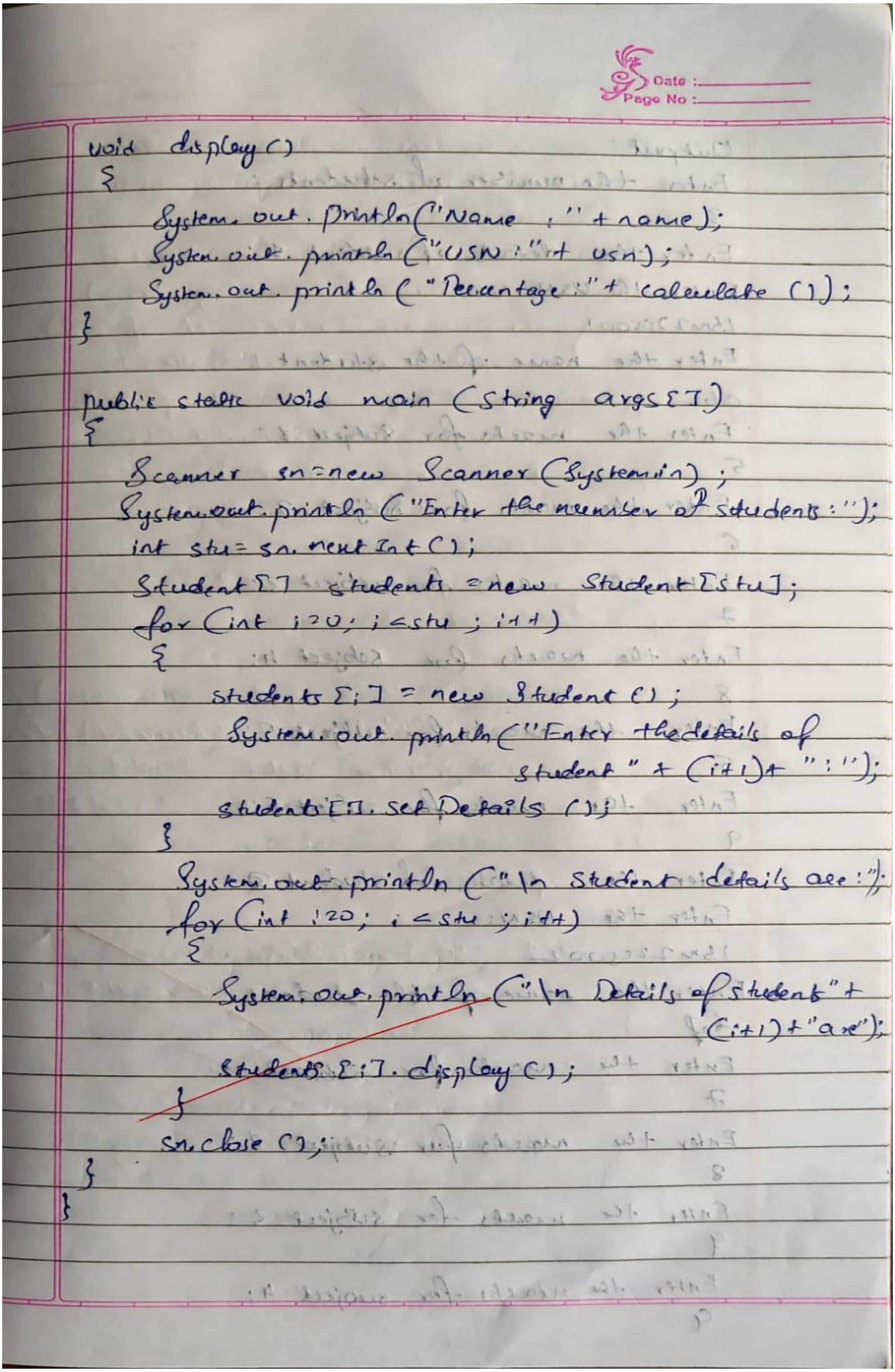
Output :

```
Enter first coefficient:
1
Enter second coefficient
2
Enter 3rd coefficient
1

Roots are ~~real~~ and equal : -1, 0
```

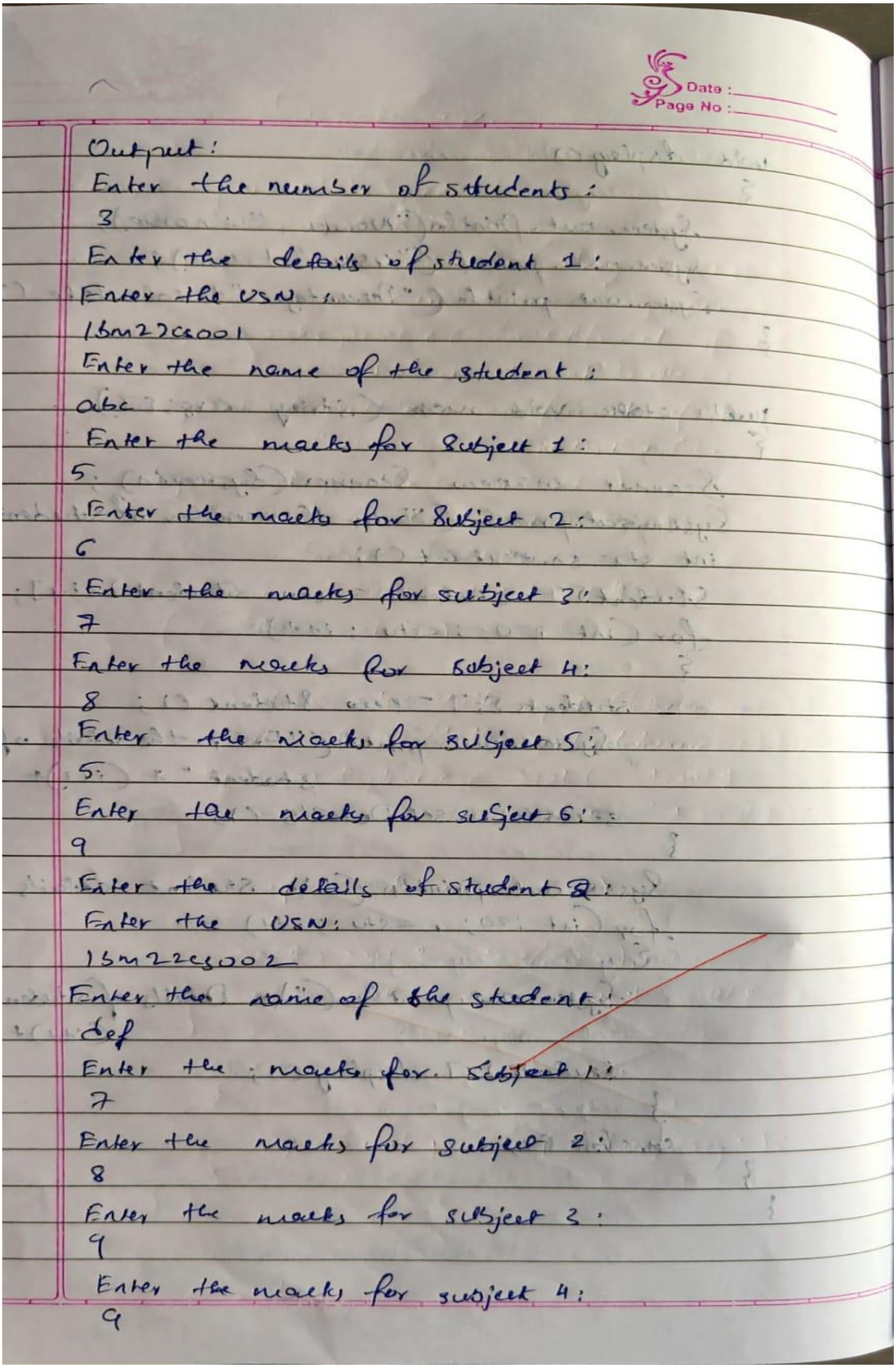


## Student

```
import java.util.Scanner;
class student
{
String name, usn;
int marks[] =new int[6];
Scanner sn=new Scanner(System.in);

void setMarks() {
    for(int i=0; i<marks.length ; i++) {
        System.out.println("Enter the marks for Subject"
                                                + (i+1)+":");
        marks[i] = sn.nextInt();
      }
   }
void setDetails()
 {
    System.out.println("Enter the USN:");
    usn = sn.next();
    System.out.println("Enter the name of the student:");
    name =sn.next();
    setMarks();
 }

double calculate()
 {
     int sum=0;
     for(int i=0; i<6; i++)
      {
           sum=sum+marks[i];
      }
 }
```



```
void display()
 {
   System.out.println("Name : "+name);
   System.out.println("USN :"+ usn);
   System.out.println( "Percentage :"+ calculate ());
 }

public static void main (String args[])
{
  Scanner sn=new Scanner(System.in);
  System.out.println("Enter the number of students :");
  int stu= sn.nextInt();
  Student[] students =new Student[stu];
  for(int i=0; i<stu ; i++)
   {
      students[i] = new Student();
       System.out.println("Enter the details of
                        student" + (i+1)+ ":");
      students[i].setDetails();
   }
    System.out.println("\n Student details are:");
    for(int i=0; i<stu; i++)
     {
        System.out.println("\n Details of student"+
                                 (i+1)+"are");
        students[i].display();
     }
    sn.close();
 }
}
```



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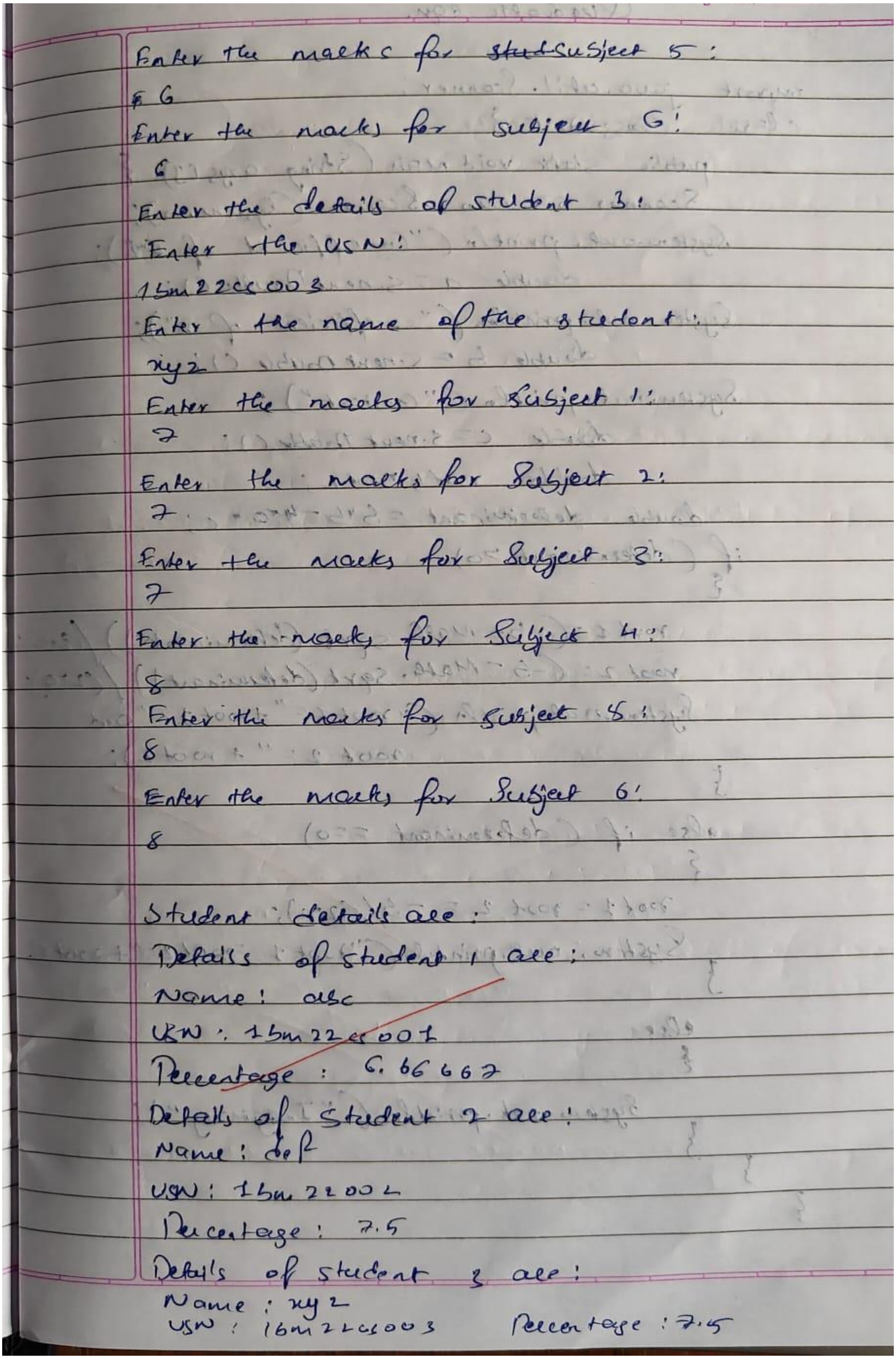
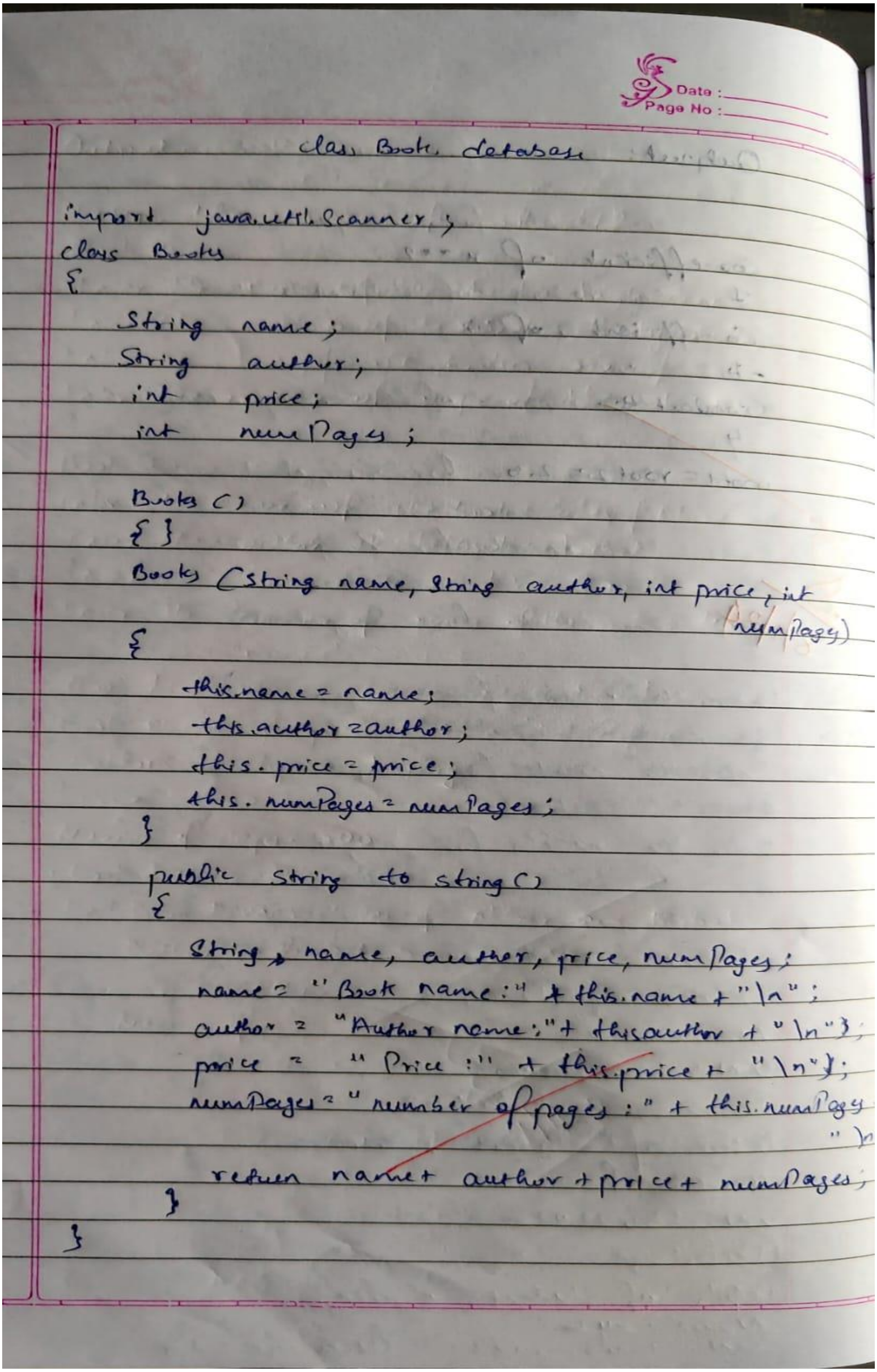
Output:

```
Enter the number of students:
3
Enter the details of student 1:
Enter the USN :
1bm22cs001
Enter the name of the student :
abc
Enter the marks for Subject 1:
5.
Enter the marks for Subject 2:
6
Enter the marks for subject 3:
7
Enter the marks for subject 4:
8
Enter the marks for subject 5:
5.
Enter the marks for subject 6:
9
Enter the details of student 2:
Enter the USN:
1bm22cs002
Enter the name of the student:
def
Enter the marks for subject 1:
7
Enter the marks for subject 2:
8
Enter the marks for subject 3:
9
Enter the marks for subject 4:
9
```

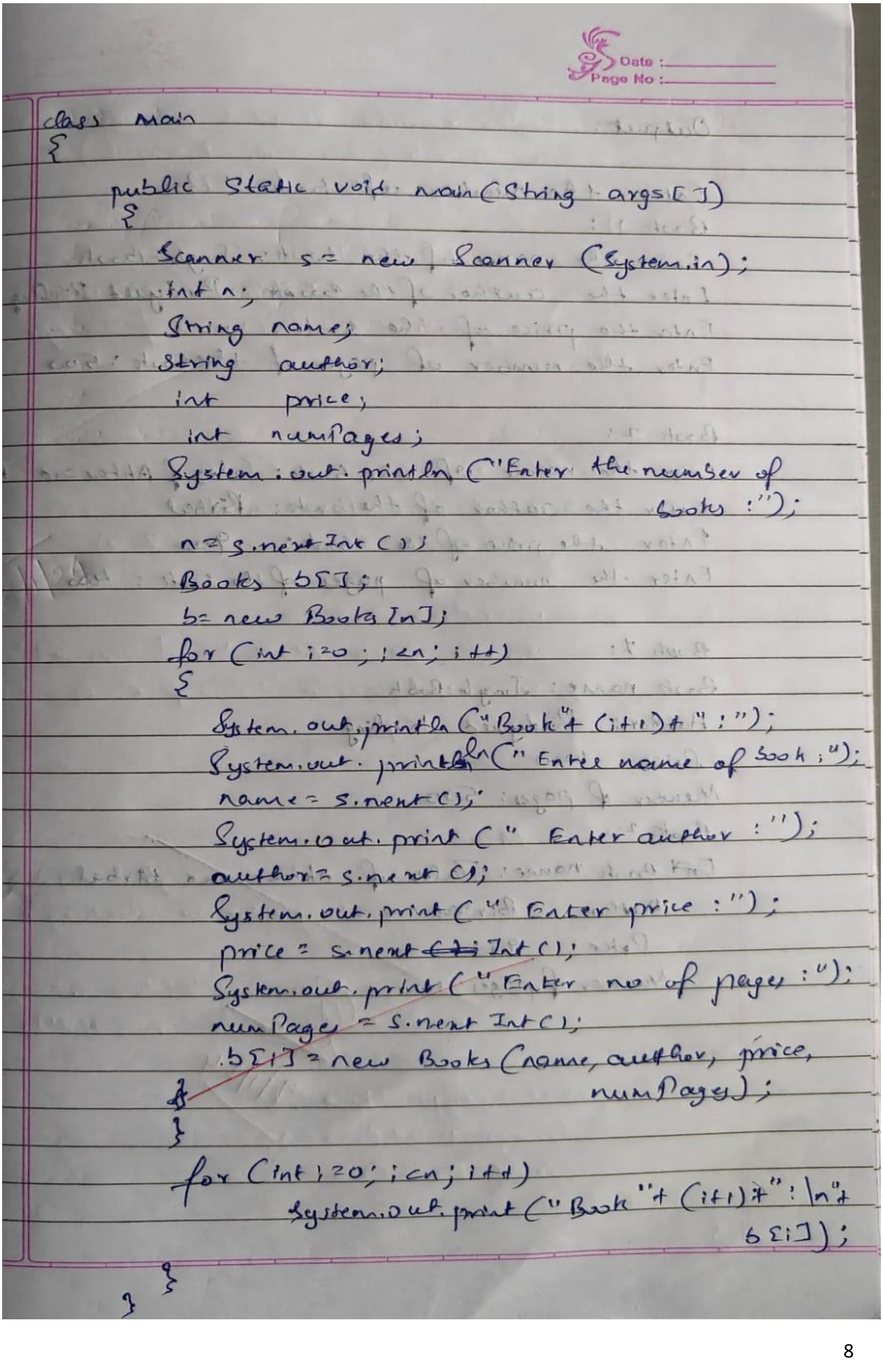


```
Enter the marks for ~~stud~~Subject 5 :
~~5~~ 6
Enter the marks for subject 6!
 6
Enter the details of student 3:
Enter the USN:
1bm22cs003
Enter the name of the student:
xyz
Enter the marks for Subject 1:
 7
Enter the marks for Subject 2:
 7
Enter the marks for Subject 3:
7
Enter the marks for Subject 4:
8
Enter the marks for subject 5:
8
Enter the marks for Subject 6:
8

Student details are:
Details of student 1 are:
Name: abc
USN: 1bm22cs001
Percentage : 6.66667
Details of Student 2 are:
Name: def
USN: 1bm22002
Percentage: 7.5
Details of student 3 are:
Name : xyz
USN : 1bm22cs003      Percentage : 7.5
```



clas, Book, database

```
import java.util. Scanner ;
class Books
{
    String name;
    String author;
    int price;
    int numPages ;

    Books ()
    { }
    Books (String name, String author, int price, int
                                              numPages)
    {
        this.name = name;
        this.author =author;
        this. price = price;
        this. numPages = numPages;
    }
    public String to string ()
    {
        String, name, auther, price, numPages;
        name = "Book name :" + this.name + "\n" ;
        author = "Auther name :"+ thisauthor + "\n"};
        price = " Price :" + this.price + "\n"};
        numPages = "number of pages :" + this.numPages
                                              "\n
        return name+ author + price+ numPages;
    }
}
```



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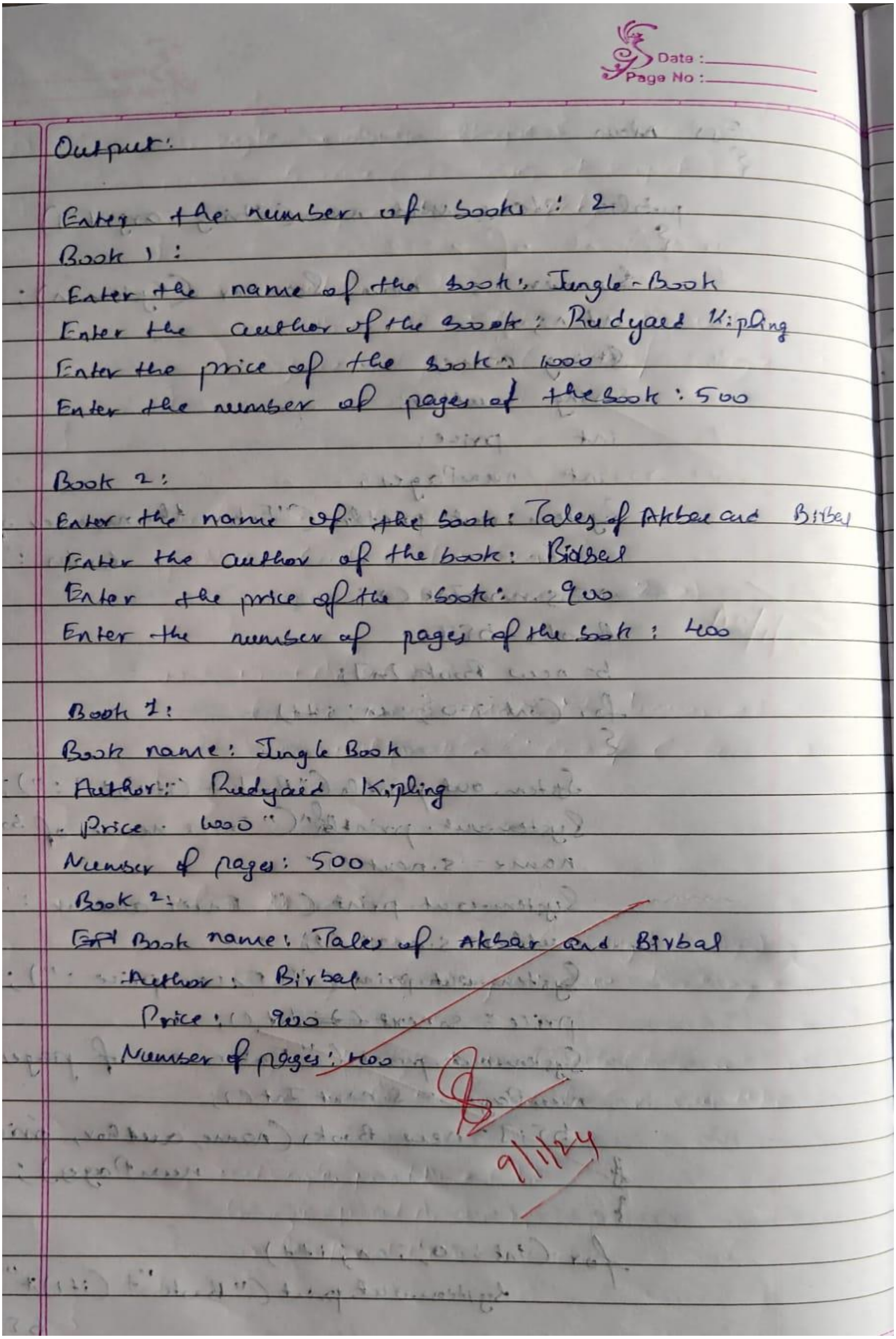
```
class Main
{
    public static void main(String args[])
     {
        Scanner s= new Scanner (System.in);
        int n;
        String name;
        String author;
        int   price;
        int  numPages;
        System.out.println ("Enter the number of
                                         books :");
        n= s.nextInt ();
        Books b[];
        b= new Books[n];
        for (int i=0 ; i<n; i++)
        {
            System.out.println ("Book"+ (i+1)+ ":");
            System.out.println(" Enter name of book :");
            name= s.next();
            System.out.print ("  Enter author :");
            author= s.next ();
            System.out.print (" Enter price :");
            price = s.next~~()~~Int();
            System.out.print (" Enter no of pages :");
            numPages = s.next Int();
            b[i] = new Books (name, author, price,
                                      numPages);
        }
        }
        for (int i=0; i<n; i++)
             System.out.print ("Book"+ (i+1)+": \n"+
                                          b[i]);
        }
}
```



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Output:

```
Enter the number of books : 2
Book 1 :
Enter the name of the book : Jungle-Book
Enter the author of the book : Rudyard Kipling
Enter the price of the book : 1000
Enter the number of pages of the book : 500

Book 2 :
Enter the name of the book : Tales of Akbar and Birbal
Enter the author of the book : Birbal
Enter the price of the book : 900
Enter the number of pages of the book : 400

Book 1 :
Book name : Jungle Book
Author : Rudyard Kipling
Price : 1000
Number of pages : 500
Book 2 :
~~Ent~~ Book name : Tales of Akbar and Birbal
  Author : Birbal
    Price : 900
  Number of pages : 400
```

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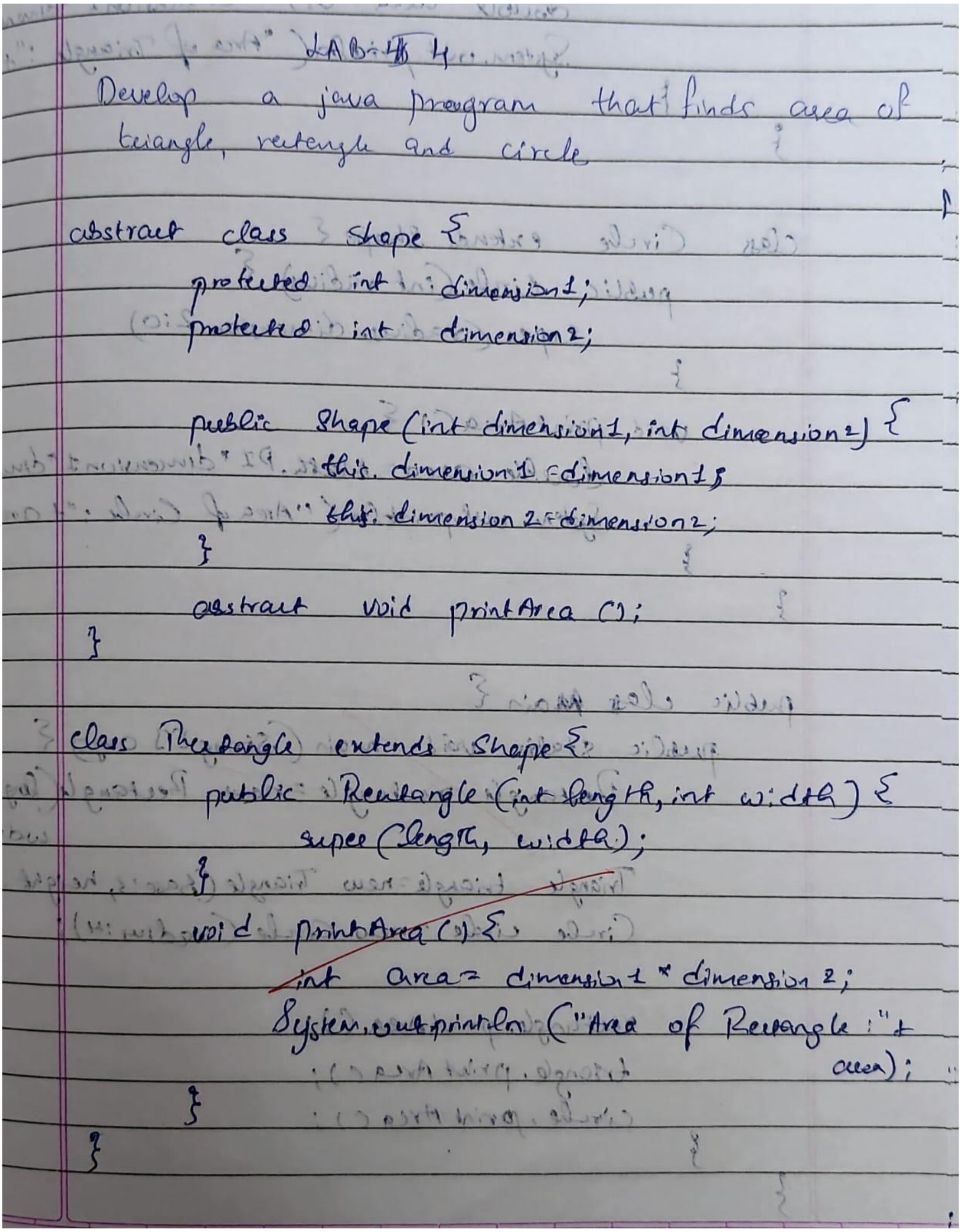


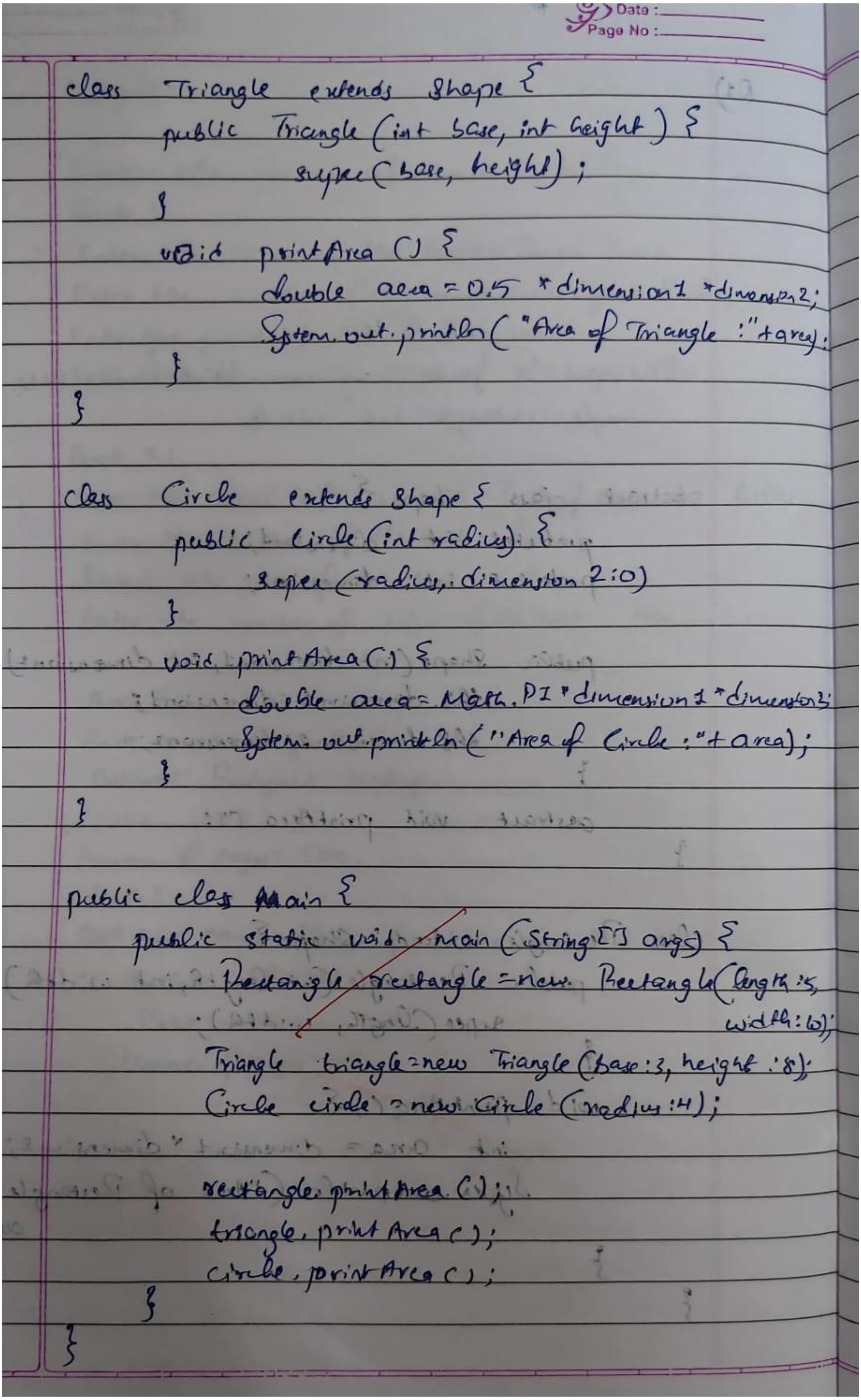
LAB:~~4~~ 4

Develop a java program that finds area of triangle, rectangle and circle

```
abstract class Shape {
        protected int dimension1;
        protected int dimension2;

        public Shape (int dimension1, int dimension2) {
            this. dimension1 = dimension1;
            this. dimension2 = dimension2;
        }
        abstract void printArea ();
}

class Rectangle extends Shape {
        public Rectangle (int length, int width) {
                super (length, width);
        }
        void printArea () {
            int area = dimension1 * dimension2;
            System.out.println ("Area of Rectangle :" +
                                                  area);
        }
}
```



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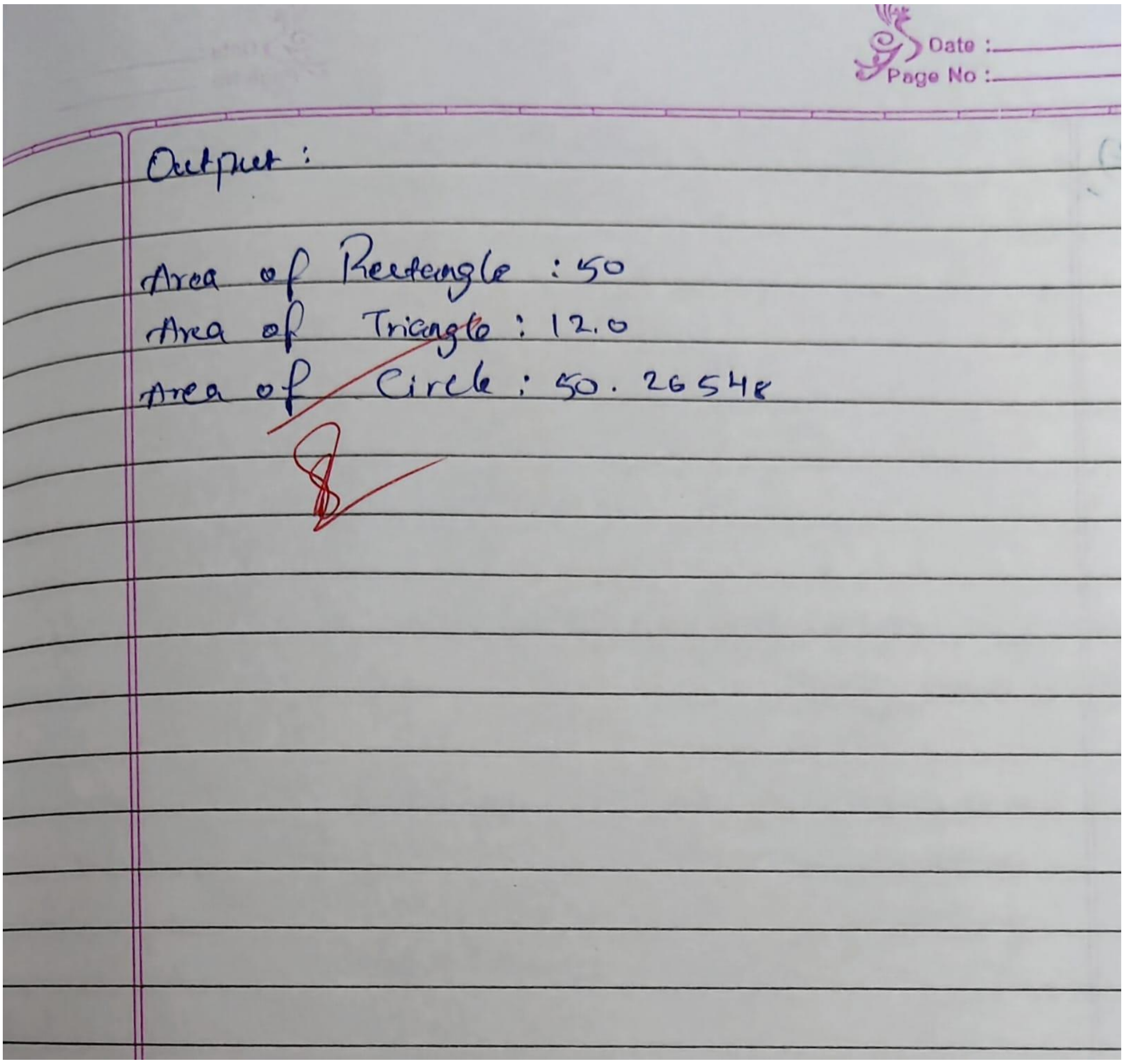
```
class Triangle extends Shape {
        public Triangle (int base, int height) {
                supre(base, height);
        }
        void printArea () {
                double area = 0.5 * dimension1 * dimension2;
                System.out.println( "Area of Triangle :"+area);
        }
}

class Circle extends Shape {
        public Circle (int radius) {
                super (radius, dimension 2:0)
        }
        void printArea () {
                double area = Math.PI * dimension1 * dimension2;
                System.out.println ("Area of Circle :"+ area);
        }
}

public class Main {
        public static void main (String [] args) {
                ~~Rectangle rectangle = new Rectangle(length:5,
                                                       width:6);~~
                Triangle triangle = new Triangle (base:3, height :8);
                Circle circle = new Circle (radius:4);

                rectangle.printArea ();
                triangle.printArea ();
                circle.printArea ();
        }
}
```



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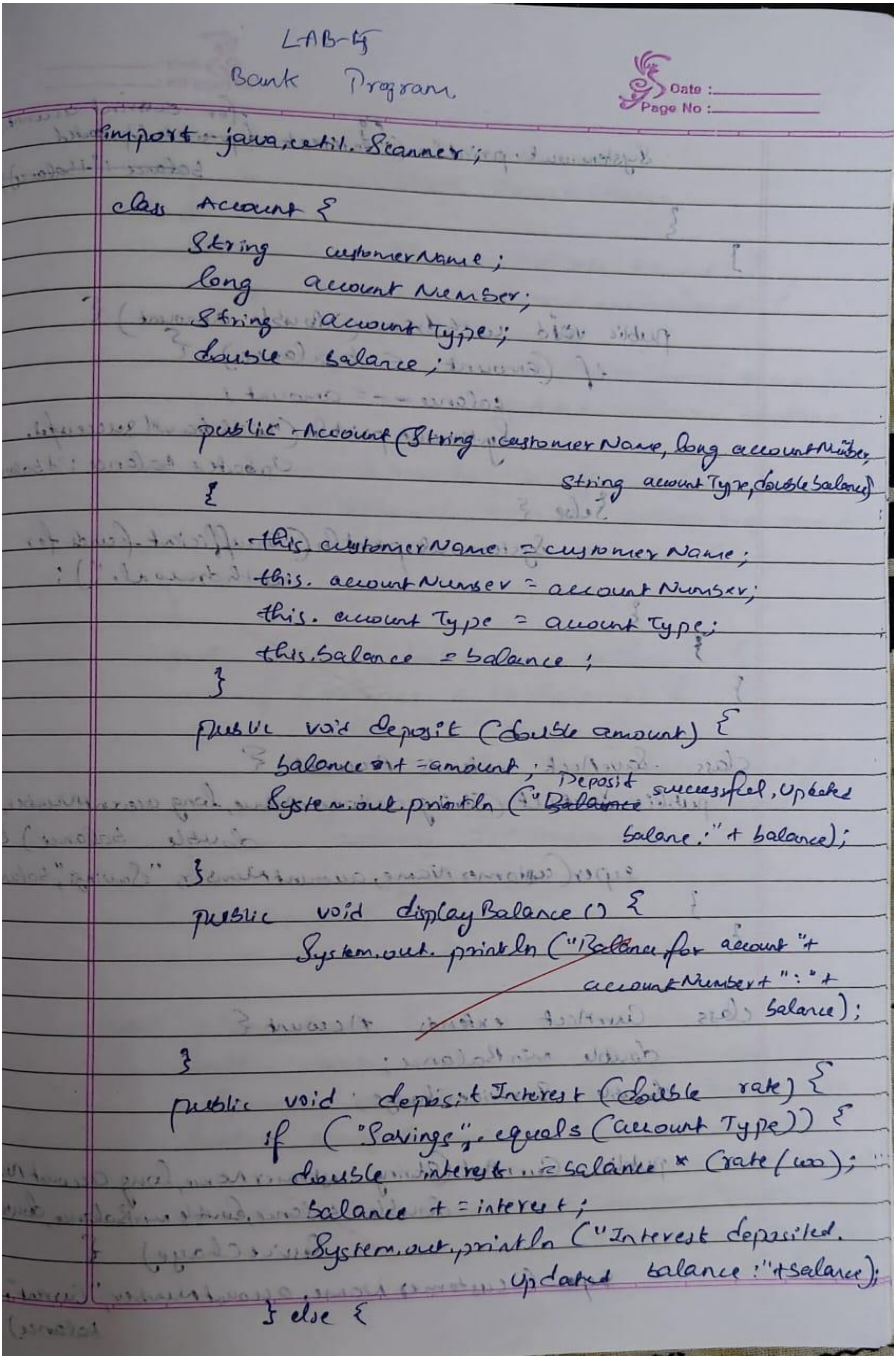
Output :

```
Area of Rectangle : 50
Area of Triangle : 12.0
Area of Circle : 50.26548
```



LAB-4

Bank Program

Date :

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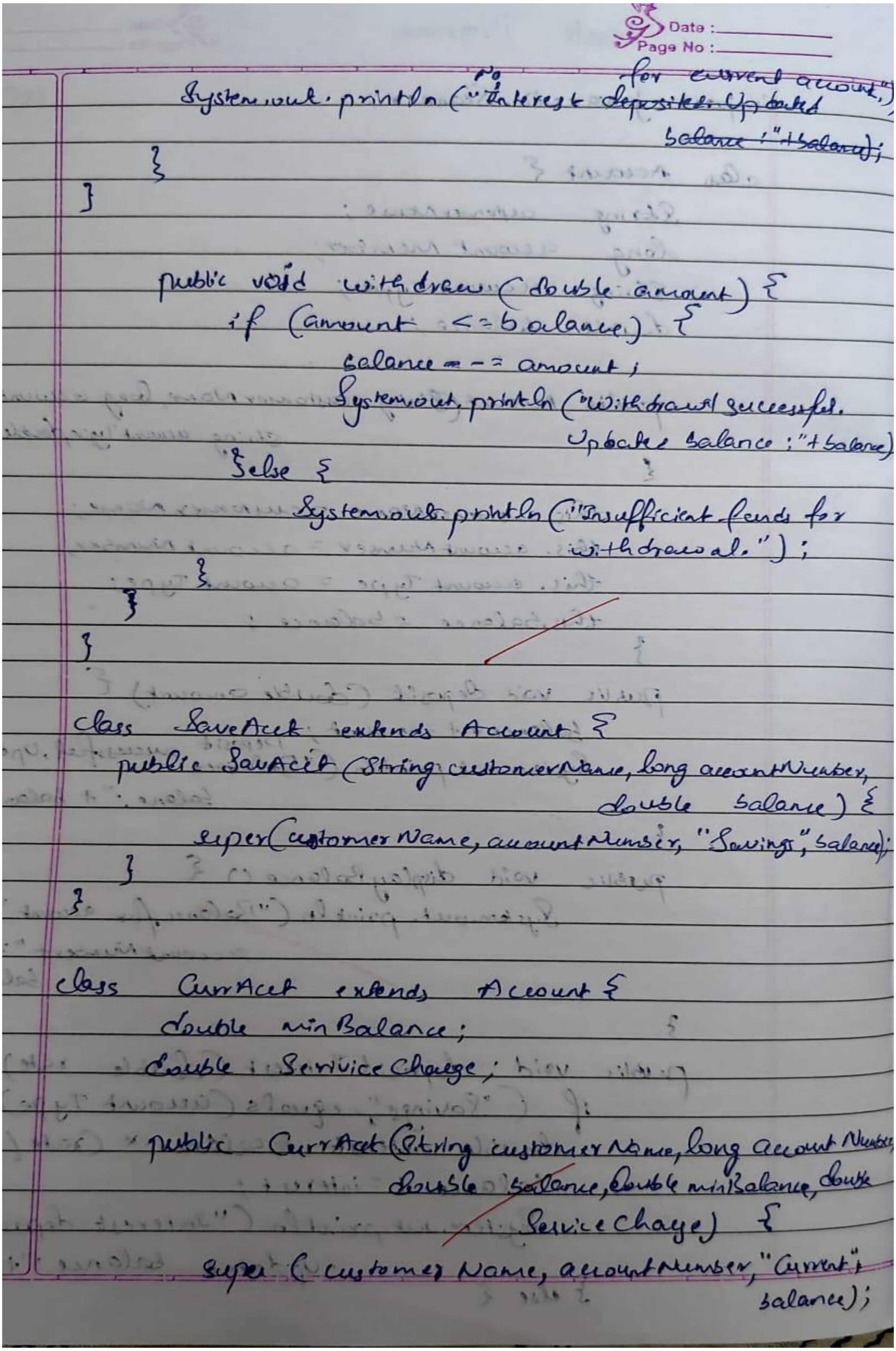
```
import java.util.Scanner;

class Account {
      String   customerName;
      long   accountNumber;
      String  accountType;
      double  balance;

      public Account(String customerName, long accountNumber,
                              String accountType, double balance)
      {
            this.customerName = customerName;
            this.accountNumber = accountNumber;
            this.accountType = accountType;
            this.balance = balance;
      }
      public void deposit (double amount) {
            balance += amount;
            System.out.println ("~~Balance~~ Deposit successful, Updated
                                                balance :" + balance);
      }
      public void displayBalance () {
            System.out.println ("Balance for account "+
                                          accountNumber+ ":"+
                                                      balance);
      }
public void depositInterest (double rate) {
         if ("Savings".equals (accountType)) {
            double interest = balance * (rate/100);
            Balance += interest;
            System.out.println ("Interest deposited.
                              Updated balance :"+balance);
      } else {
```



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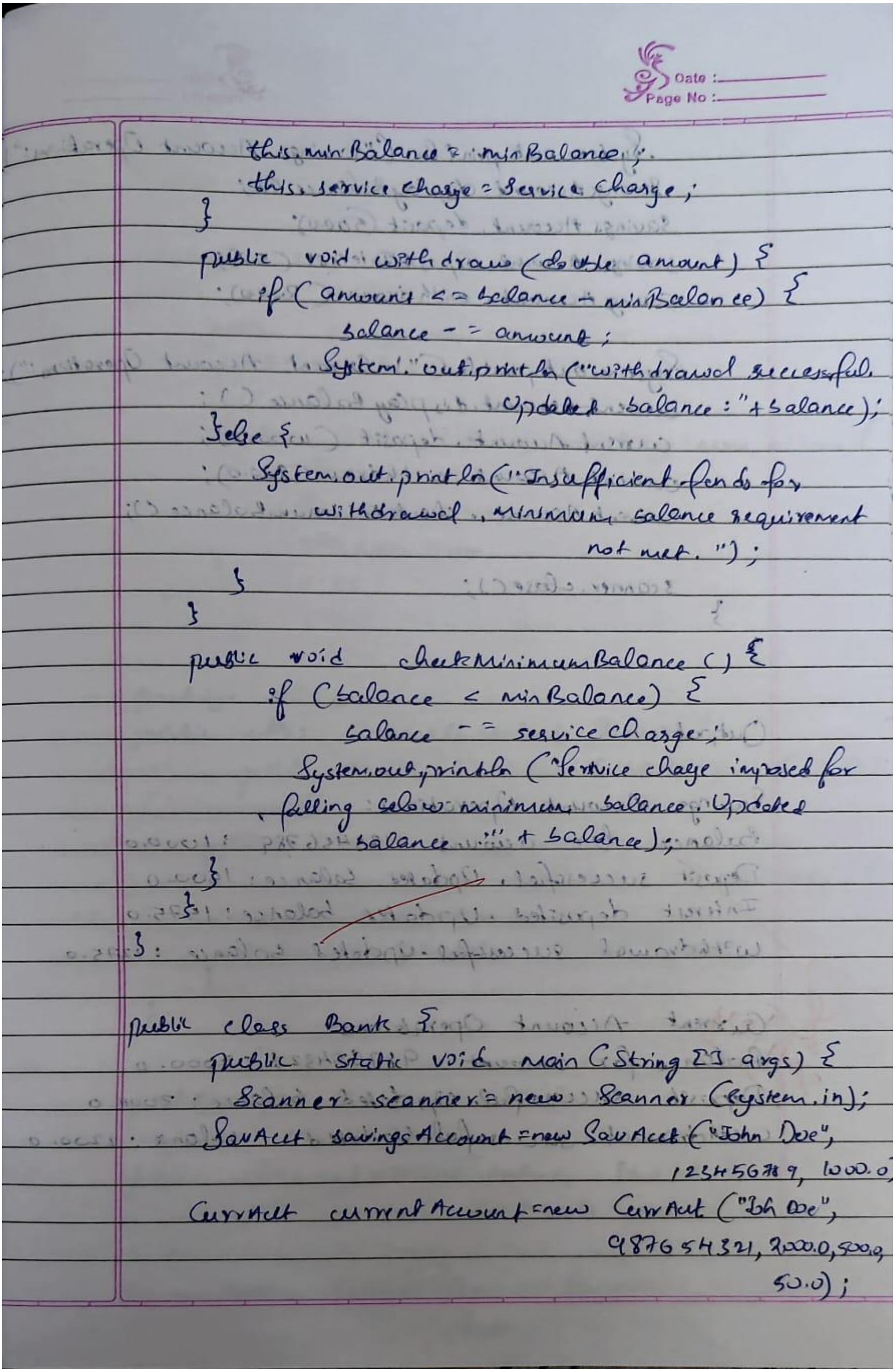
```
        System.out.println("No interest ~~deposited. Updated
                                        balance :"+balance)~~ for current account.");
    }
}


    public void withdraw(double amount) {
        if (amount <= balance) {
                balance -= amount;
                System.out.println("Withdrawal successful.
                                        Updated balance :"+balance)
        }else {
                System.out.println("Insufficient funds for
                                        withdrawal.");
        }
    }
}

class SaveAcct extends Account {
    public SavAcct (String customerName, long accountNumber,
                                        double balance) {
        super(customerName, accountNumber, "Savings", balance);
    }
}

class CurrAcct extends Account {
        double minBalance;
        double ServiceCharge;

        public CurrAcct(String customerName, long account Number,
                        double balance, double minBalance, double
                                ServiceChage) {
        super (customer Name, accountNumber, "Current",
                                                balance);
```



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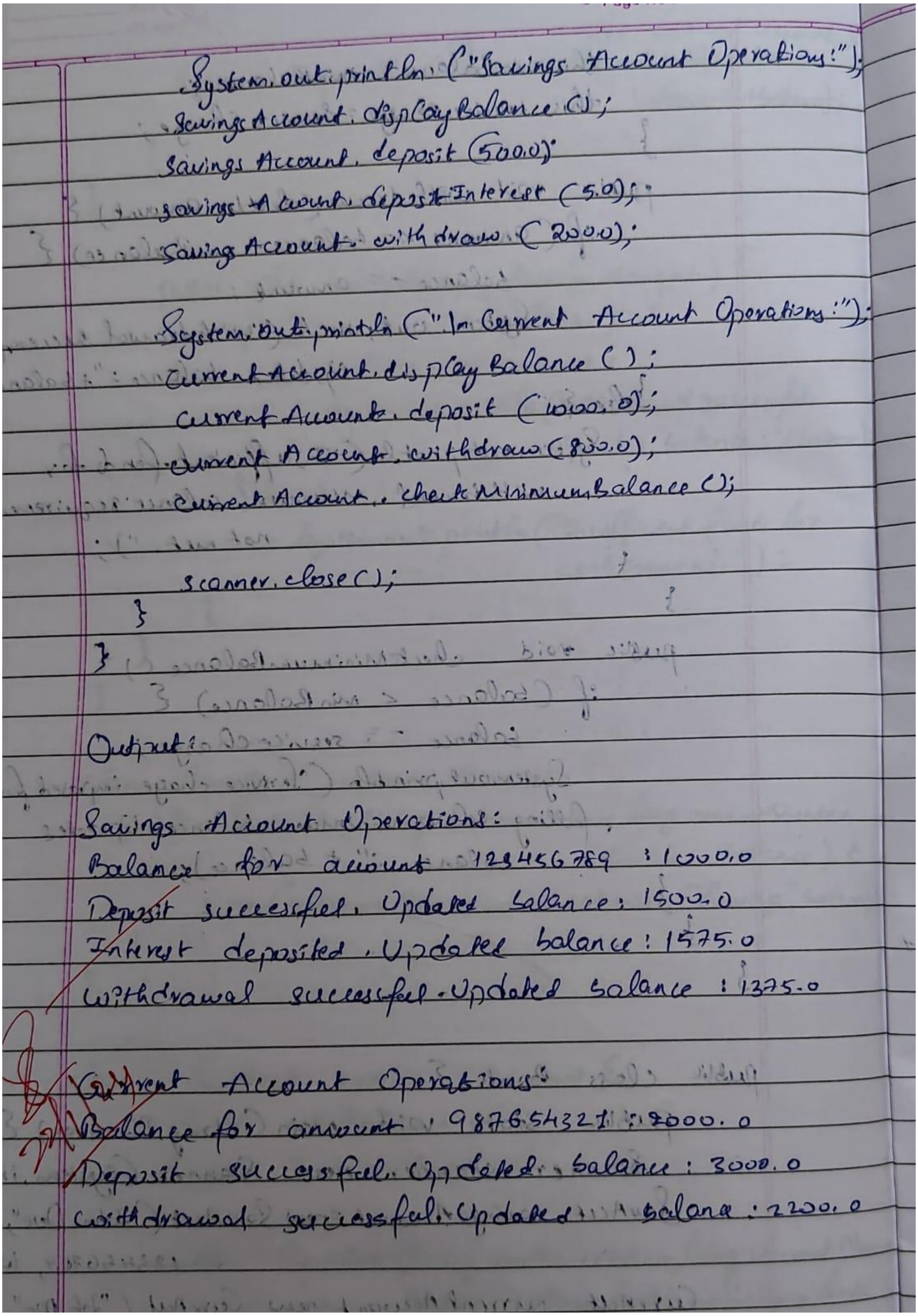
```
        this.minBalance = minBalance;
        this.serviceCharge = serviceCharge;
    }
    public void withdraw(double amount) {
        if (amount <= balance - minBalance) {
            balance -= amount;
            System.out.println("withdrawal successful.
                       Updated balance :" + balance);
        } else {
            System.out.println("Insufficient funds for
                withdrawal. Minimum balance requirement
                                    not met.");
        }
    }
    public void checkMinimumBalance() {
        if (balance < minBalance) {
            balance -= serviceCharge;
            System.out.println("Service charge imposed for
            falling below minimum balance. Updated
                  balance :" + balance);
        }
    }
};

public class Bank {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        SavAcct savingsAccount = new SavAcct("John Doe",
                                    123456789, 1000.0,
    CurrAcct currentAccount = new CurrAcct("Joh Doe",
                           987654321, 2000.0, 500.0,
                                           50.0);
```



```
        System.out.println("Savings Account Operations:");
        SavingsAccount.displayBalance();
        SavingsAccount.deposit(500.0)
        savingsAccount.depositInterest(5.0);
        SavingsAccount.withdraw(200.0);

        System.out.println("\n Current Account Operations:");
        CurrentAccount.displayBalance();
        currentAccount.deposit(1000.0);
        currentAccount.withdraw(800.0);
        currentAccount.checkMinimumBalance();

        scanner.close();
    }
}
```

Output:

```
Savings Account Operations:
Balance for account 123456789 :1000.0
Deposit successful. Updated balance: 1500.0
Interest deposited. Updated balance: 1575.0
Withdrawal successful. Updated balance : 1375.0

Current Account Operations:
Balance for account 987654321 :2000.0
Deposit successful. Updated balance : 3000.0
Withdrawal successful. Updated balance : 2200.0
```

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Packages

```
package CIE;
public class Student {
    public Strings usn, name;
    public int sem;

    public Student (String usn, String name, int sem){
        this.usn = usn;
        this.name = name;
        this.sem = sem;
    }
}

package CIE;
public class Internals extends Student {
    public double [] internalMarks = new double[5];

    public Internals (String usn, String name, int sem,
                          double[] internalMarks, ) {
        super (usn, name, ~~usn~~sem);
        this. internalMarks = internalMarks;
    }
}

package SEE;
import CIE.student;
public class External extends Student {
    public double [] seeMarks = new double [5];

    public External(String usn, String name, int sem,
                        double[] seeMarks) {
```

Page No :

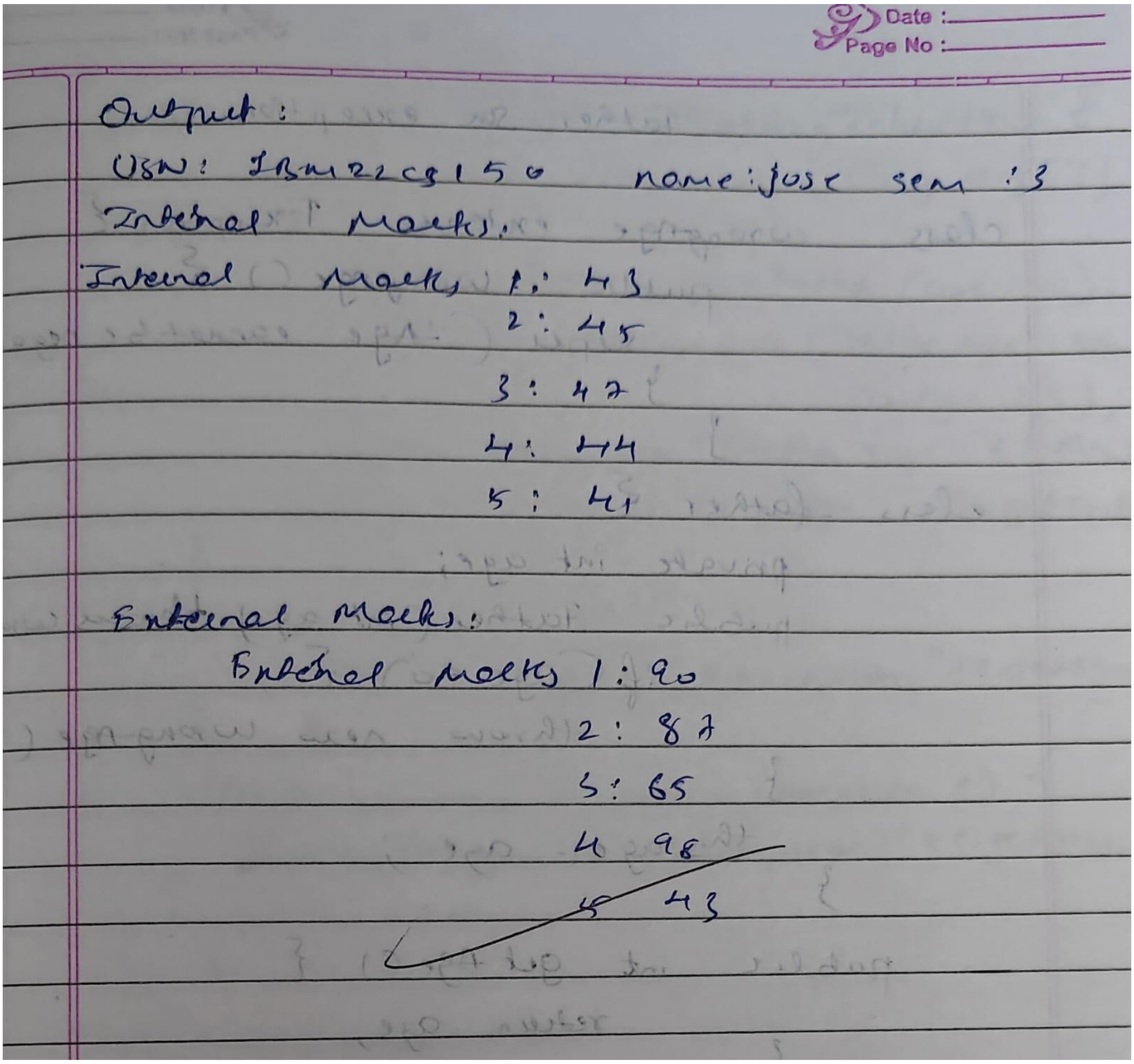
```
            super(usn, name, sem);
            this.seeMarks = seeMarks;
        }
    }

package result;
import CIE.Student;
import CIE.Internals;
import SEE.External;

public class result {
    public static void main (String args[]) {
        double internal[] = {43, 45, 47, 44, 41};
        double externals[] = {90, 87, 85, 98, 43};

        Student s1=new Student ("1BM22CS150", "jose", 3);
        Internals i1= new Internals("1BM22CS150", "jose", 3,
                                             internal);
        External e1 = new External ("1BM22CS150", "jose", 3,
                                             externals);

        System.out.println ("USN :"+ s1.usn + "name:" +s1.name+
                          "sem:" + s1.sem);
        System.out.println ("Internals marks");
        for (int i=0; i<5; i++) {
            System.out.println ("Internal marks" + (i+1) +
                ": " + i1.internalMarks[i]);
        }
        System.out.println ("External marks");
        for (int i=0; i<5; i++) {
            System.out.println ("External marks"+(i+1) + ":"+
                                          e1.seeMarks[i]);
        }
    }
}
```



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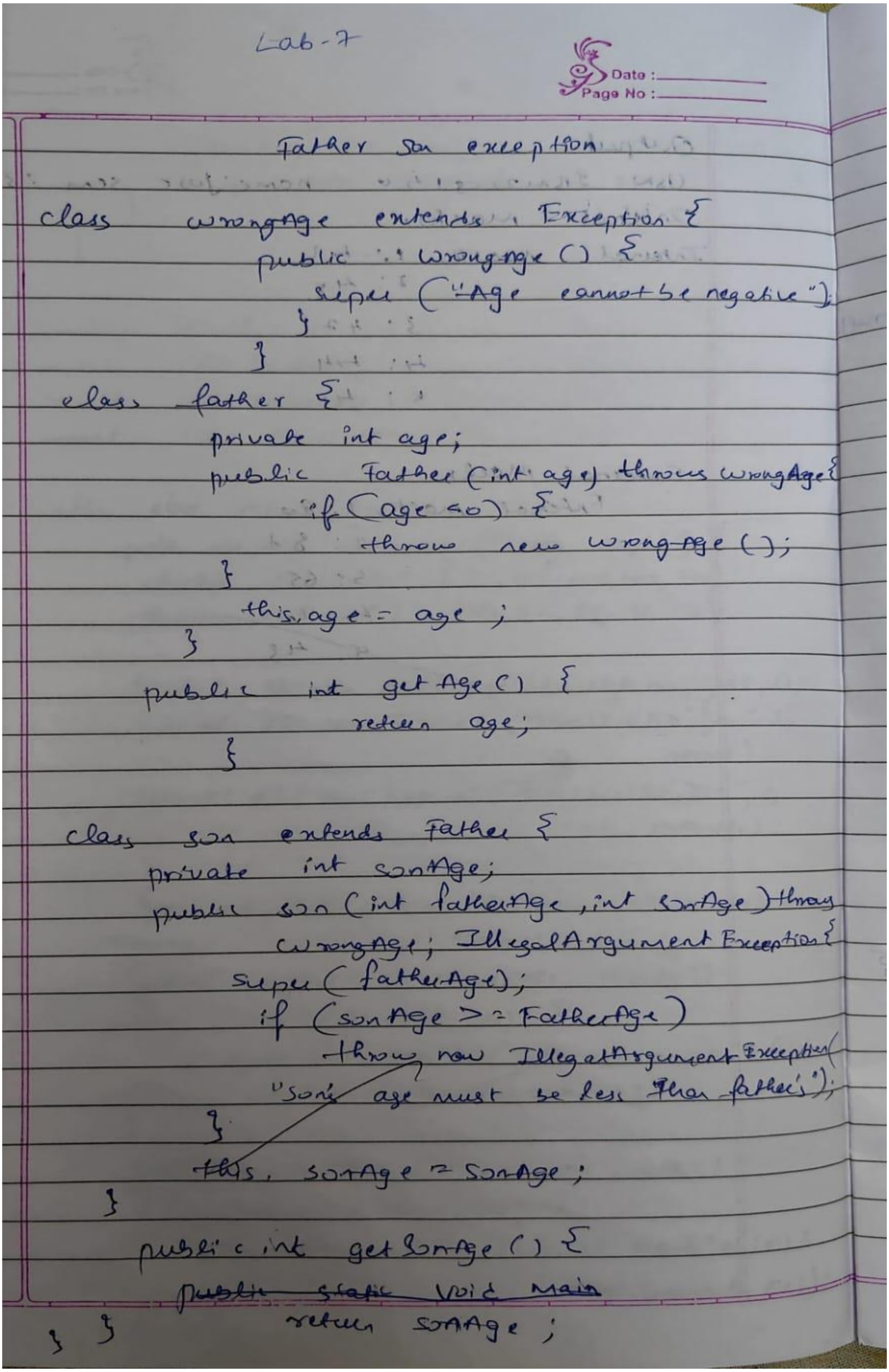
```
Output :
USN: 1BM22CS150      name: jose    sem :3
Internal Marks:
Internal Marks 1: 43
               2: 45
               3: 47
               4: 44
               5: 41

External Marks:
      External Marks 1: 90
                     2: 87
                     3: 65
                     4 98
                     5 43
```



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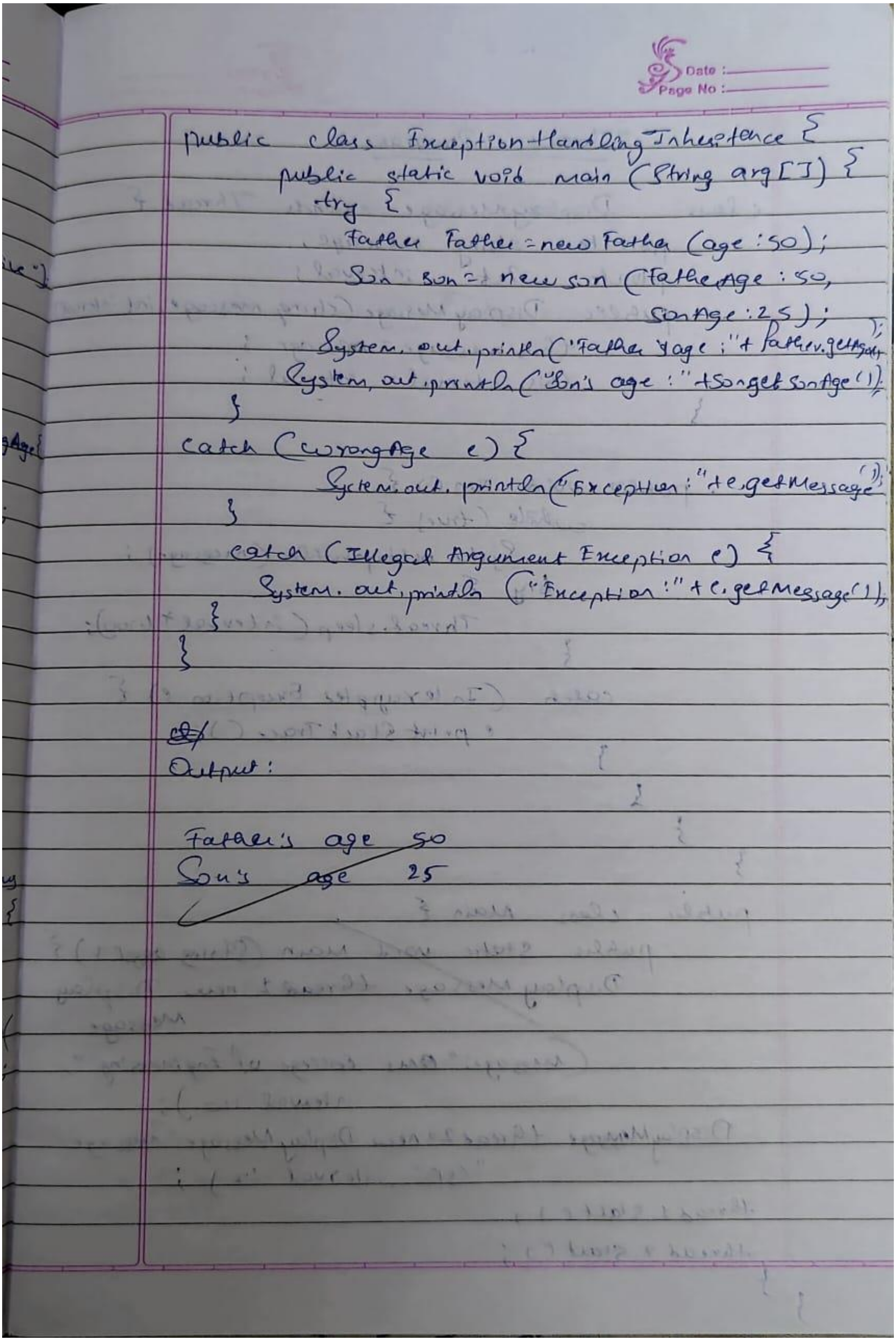
Father son exception

```
class   wrongAge   extends   Exception {
            public   wrongAge () {
                  super ("Age   cannot be negative");
            }
        }
  class   father {
          private   int age;
          public    Father (int age) throws wrongAge{
                 if (age <0) {
                      throw   new   wrongAge ();
              }
                this.age = age ;
            }
      public    int   get Age () {
                     return   age;
              }

  class   son   extends   Father {
        private   int   sonAge;
        public   son (int fatherAge ,int sonAge) throws
                  wrongAge; IllegalArgument Exception{
              super( fatherAge);
                if (sonAge >= FatherAge)
                      throw new IllegalArgumentException(
                  "son's age must be less than father's");
              }
              ~~this~~, sonAge = sonAge;
      }
      public int   getSonAge () {
        ~~public   static   void   Main~~
 } }               return   sonAge ;
```



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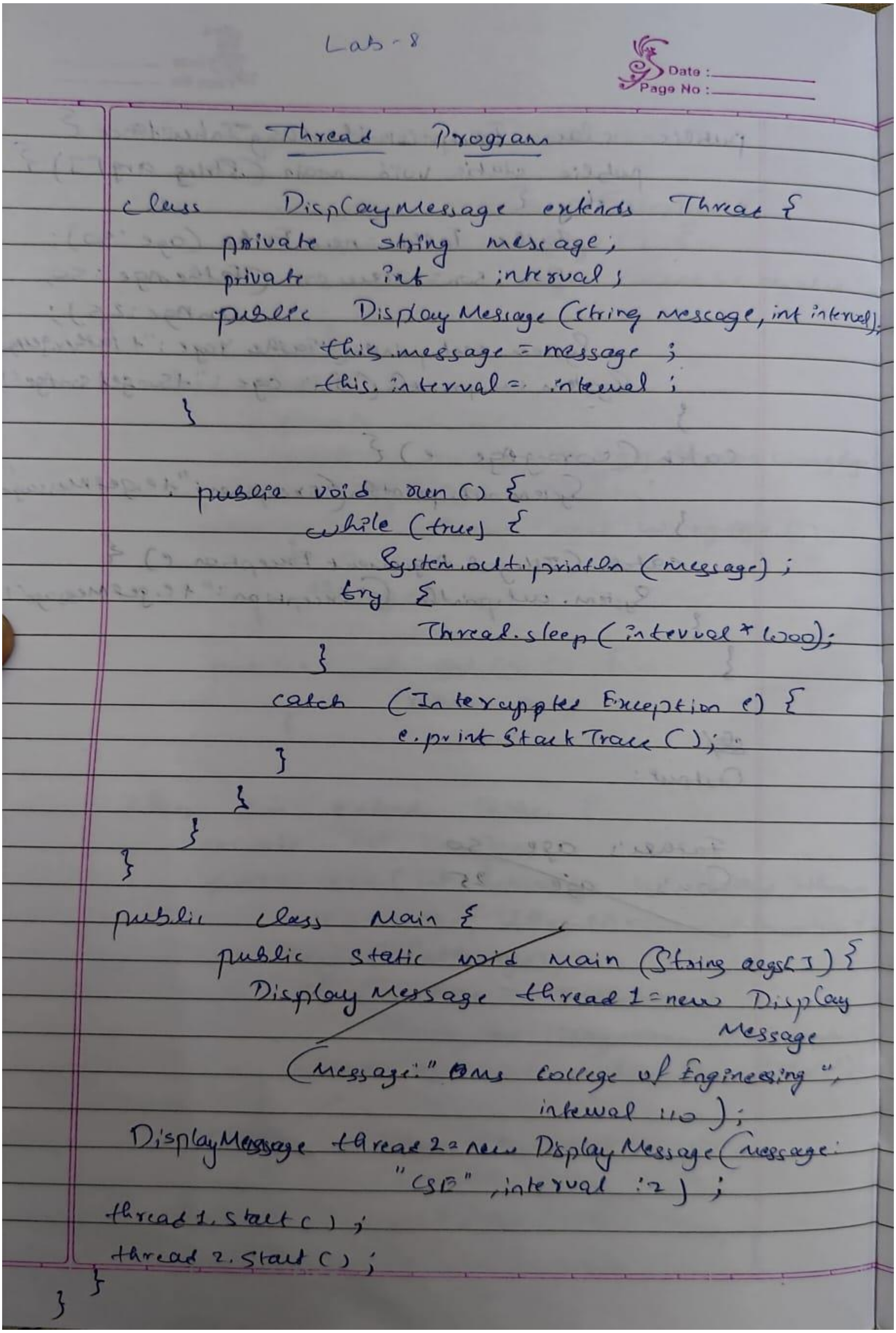
```
public class Exception-Handling Inheritance {
      public static void main (String arg[]) {
        try {
            Father Father = new Father (age :50);
              Son son = new son (FatheAge : 50,
                                   SonAge : 25);
              System. out. println ("Father's age : " + Father.getAge());
          System. out. println ("Son's age : " +Son.getSonAge());
      }
  catch (wrongAge e) {
            System. out. println ("Exception : " +e.getMessage());
      }
      catch (Illegal Argument Exception e) {
        System. out. println ("Exception : " + e.getMessage());
    }
}
```

Output :

```
Father's age   50
Son's    age   25
```



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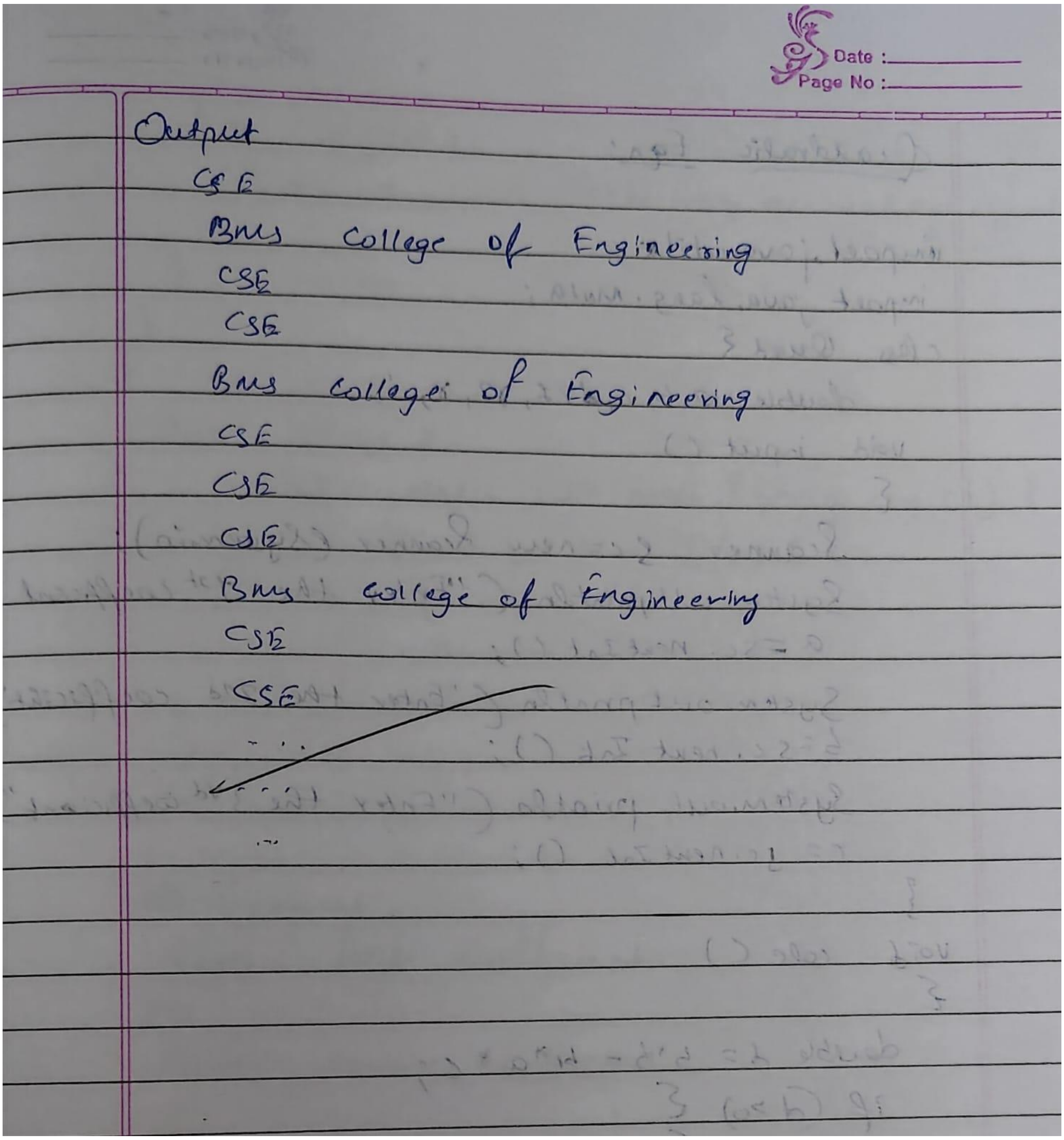
Thread Program

```
class   DisplayMessage  extends  Threat {
        private   string   message;
        private   int   interval;
        public   DisplayMessage (string message, int interval);
                this.message = message ;
                this.interval = inteeval ;
        }

        public void run () {
                while (true) {
                        System.out.println (message) ;
                try {
                        Threal.sleep (interval * 1000);
                }
              catch  (Interuppted Exception e) {
                        e.printStackTrace ();
              }
           }
        }
}
public  class  Main {
        public  static  void  main (String args[]) {
          DisplayMessage  thread1 = new  Display
                                          Message
              (message:"BMS College of Engineering",
                                   interval :10 );
  DisplayMessage thread2 = new DisplayMessage(message:
                     "CSE" ,interval :2) ;
thread1.start () ;
thread2.start () ;
 }
}
```



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Output

```
CSE
Bms College of Engineering
CSE
CSE
Bms college of Engineering
CSE
CSE
CSE
Bms college of Engineering
CSE
CSE
...
...
...
```