LAB. PROGRAMS.

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Week 3 (Lab 1)

Q-1) Develop a Java Program that prints all real solutions to the quadratic equation $ax^2+bx+c=0$. Read in a, b, c and use the quadratic formula. If the discriminate b^2-4ac is negative, display a message stating that there are no real solutions.

→
```
import java.util.Scanner;
import java.lang.Math;
class quadeqn
{
   public static void main(String args[])
   {     int a,b,c,d;
         double r1, r2;
   Scanner get = new Scanner (System.in);
   System.out.println("Enter three coeffecients
                       according to decreasing power
                       of x:\n");
   a=get.nextInt();
   b=get.nextInt();
   c=get.nextInt();
   System.out.println("a="+a+" b="+b+" c="+c);
   d=b*b-4*a*c;
   if(d>0)
   { System.out.println("Roots are real and unequal");
     r1 = (-b+Math.sqrt(d))/(2*a);
     r2 = (-b-Math.sqrt(d))/(2*a);
     System.out.println("\nr1="+r1+" r2="+r2);
   }
   else
   if(d==0)
```

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```
{ System.out.println(" Roots are real and equal");
   r1 =(-b)/(2*a);
   System.out.println ("\nr = " +r1);
}
else
if(d<0)
System.out.println(" Roots are imaginary");
}
}
```

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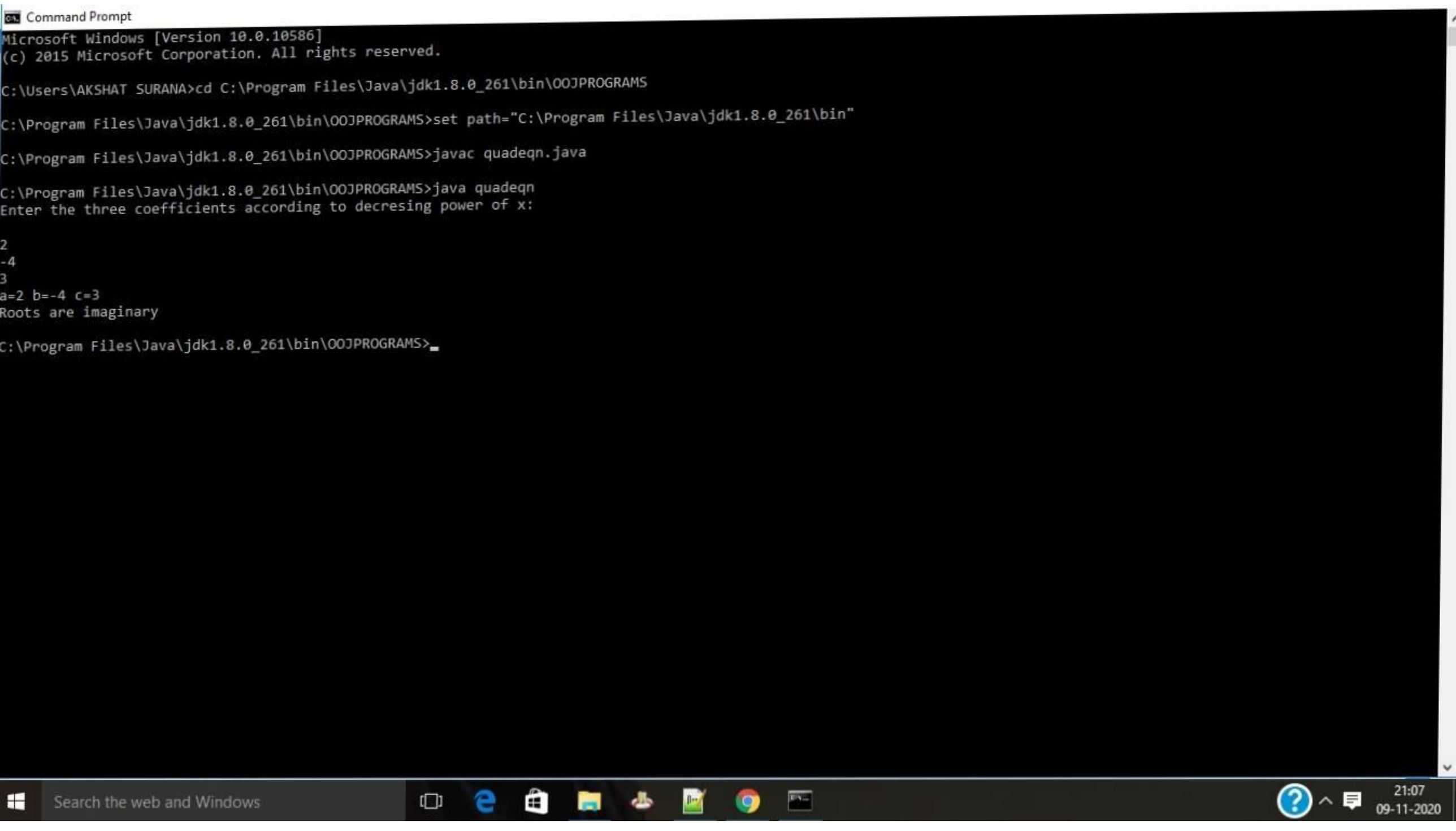

Week 4 (Lab 2)

Q-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.

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

    void getDetails(int n)
{
    System.out.println("Enter Students details :\n");
    Scanner get = new Scanner(System.in);
    System.out.println("USN :");
    usn = get.next();
    System.out.println("Name:");
    name = get.next();
    marks = new int[n];
    credits = new int[n];
    System.out.println("Enter marks and credits
                        respectively:");
    for(int i=0; i<n; i++)
{ System.out.println("\nSubject" + (i+1));
    marks[i] = sl.nextInt();
```

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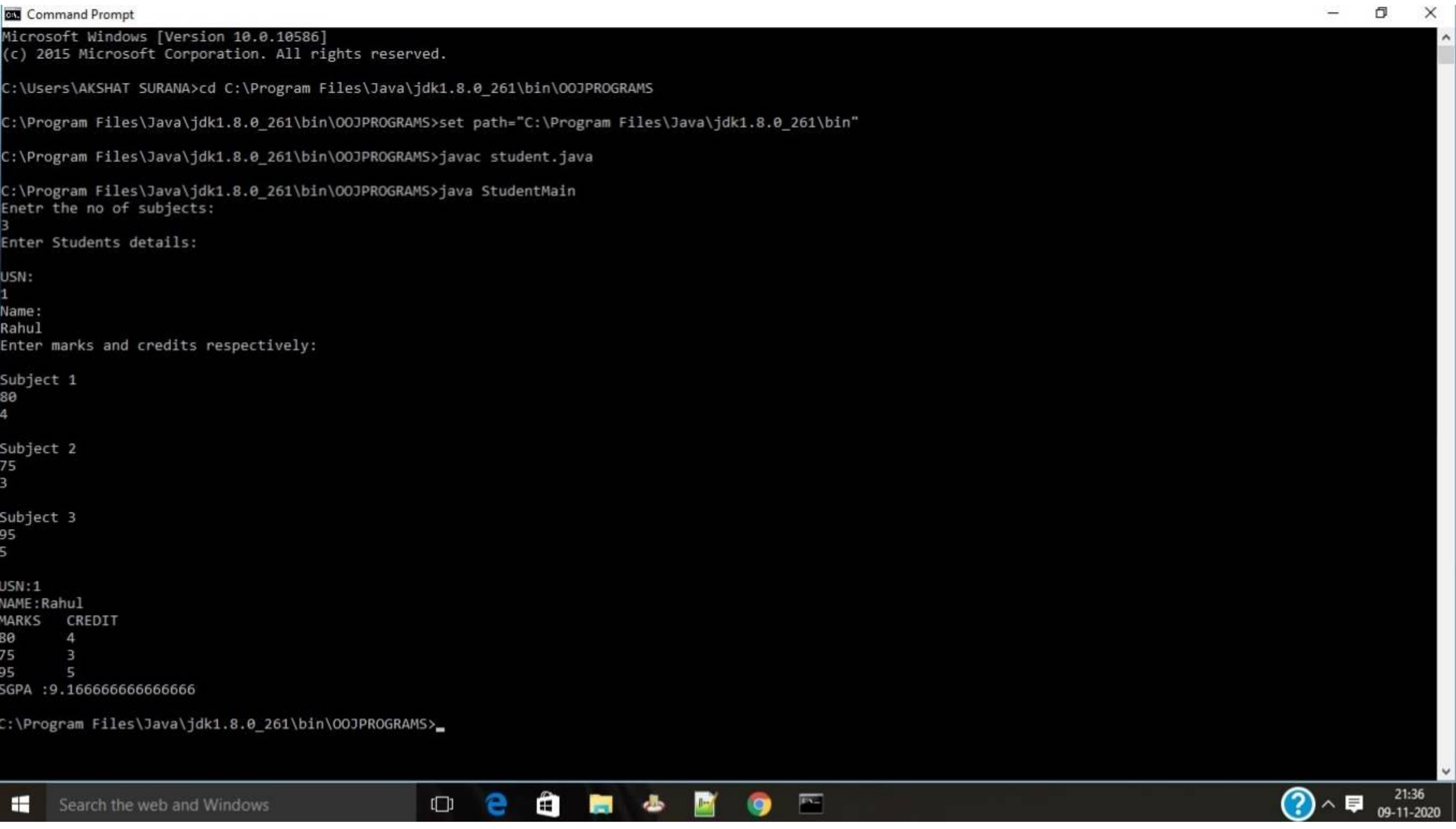
```
    credits [i] = sl.nextInt();
  }
}

void calcsgpa (int n)
{  double sum=0, sgpa, sumc=0;
   for (int i=0; i<n; i++)
   { sum= (marks [i] /10+1) * credits [i] +sum;
     sumc= credits [i] +sumc;
   }
  sgpa = sum/sumc;
  System.out.println ("SGPA :" +sgpa);
}
void printDetails (int n)
{
 System.out.println ("\nUSN :" +usn);
 System.out.println (" NAME :" +name);
 System.out.println (" MARKS\t CREDIT");

 for (int i=0; i<n; i++)
 System.out.println(marks [i] + " \t" + credits [i]);
  calcsgpa(n);
 }
}

class StudentMain
{
public static void main (String ss[])
{  int n;
   System.out.println ("Enter the no. of subjects:");
   Scanner get = new Scanner (System.in);
   n= get.nextInt();
   Student s1=new Student();
   s1.getDetails (n);
   s1.printDetails (n);
} }
```

Anshul H. Suvarna



Q-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.

→
```
import java.util.Scanner;
class book
{ String name, author;
    int price, num_pages;

  void book()
{ name = " ";
  author = " ";
  price = 0;
  num_pages = 0;
}
void get1()
{
 Scanner get = new Scanner (System.in);
 System.out.println ("\n Enter the name:");
 name = get2.next();
 System.out.println(" Enter the author:");
 author = get2.next();
 System.out.println(" Enter the price:");
 price = get2.nextInt();
 System.out.println(" Enter the no. of pages:");
 price = get2.nextInt();
}
```

Arshad H. Suma

```
void out()
{ System.out.println ("NAME: "+name);
  System.out.println ("AUTHOR: "+author);
  System.out.println ("PRICE: "+ price);
  System.out.println ("PAGES: " + num_pages);
}

public String toString()
 { return ("\nNAME: "+name+"\nAUTHOR: "+
          author+"\nPRICE: "+price+"\nPAGES:
              " +num_pages);
 }
{
class Main
{ public static void main (String args[])
  { Scanner get = new Scanner (System.in);
    int n, ch;
    System.out.println (" Enter the no. of books
                          to be entered:");
n= get.nextInt();
book b[ ]= new book [n];
for (int i=0; i<n; i++)
{ b[i]= new book();
    b[i].get();
}
System.out.printer (" Display " );
ch= get.nextInt();
switch(ch)
{ case 1: for (int i=0; i<n; i++)
    { b[i].out(); }
      break;
case 2: for (int i=0 ; i<n; i++)
    { System.out.println( b[i]); }
      break;
} } default: System.out.println ("Enter valid no.")
                                  Anshul M. Suran
```

Command Prompt

```
C:\Program Files\Java\jdk1.8.0_261\bin\OOJPROGRAMS>java book2Main
Enter the no of books to be entered:
1

Enter the name:
Javabook
Enter the author:
Balasubramanyam
Enter the price:
790
Enter the no of pages:
1500
Display
1.Function Method
2.String method
Enter choice:
1
NAME: Javabook
AUTHOR: Balasubramanyam
PRICE: 1500
PAGES: 0

C:\Program Files\Java\jdk1.8.0_261\bin\OOJPROGRAMS>
```

0-4) 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.

→
```
import java.util.*;
abstract class Shape
{
    int l, b, r;
  Scanner input = new Scanner (System.in);
  abstract void printArea();
}
class Rectangle extends Shape
{
    void printArea()
    {
  System.out.println ("FOR RECTANGLE");
  System.out.println(" Enter length and breadth");
  l = input.nextInt();
  b = input.nextInt();
 System.out.println(" The area of Rectangle
        is :" + l*b);
    }
}
class Triangle extends Shape
{ void printArea()
  { System.out.println(" FOR TRIANGLE ");
```

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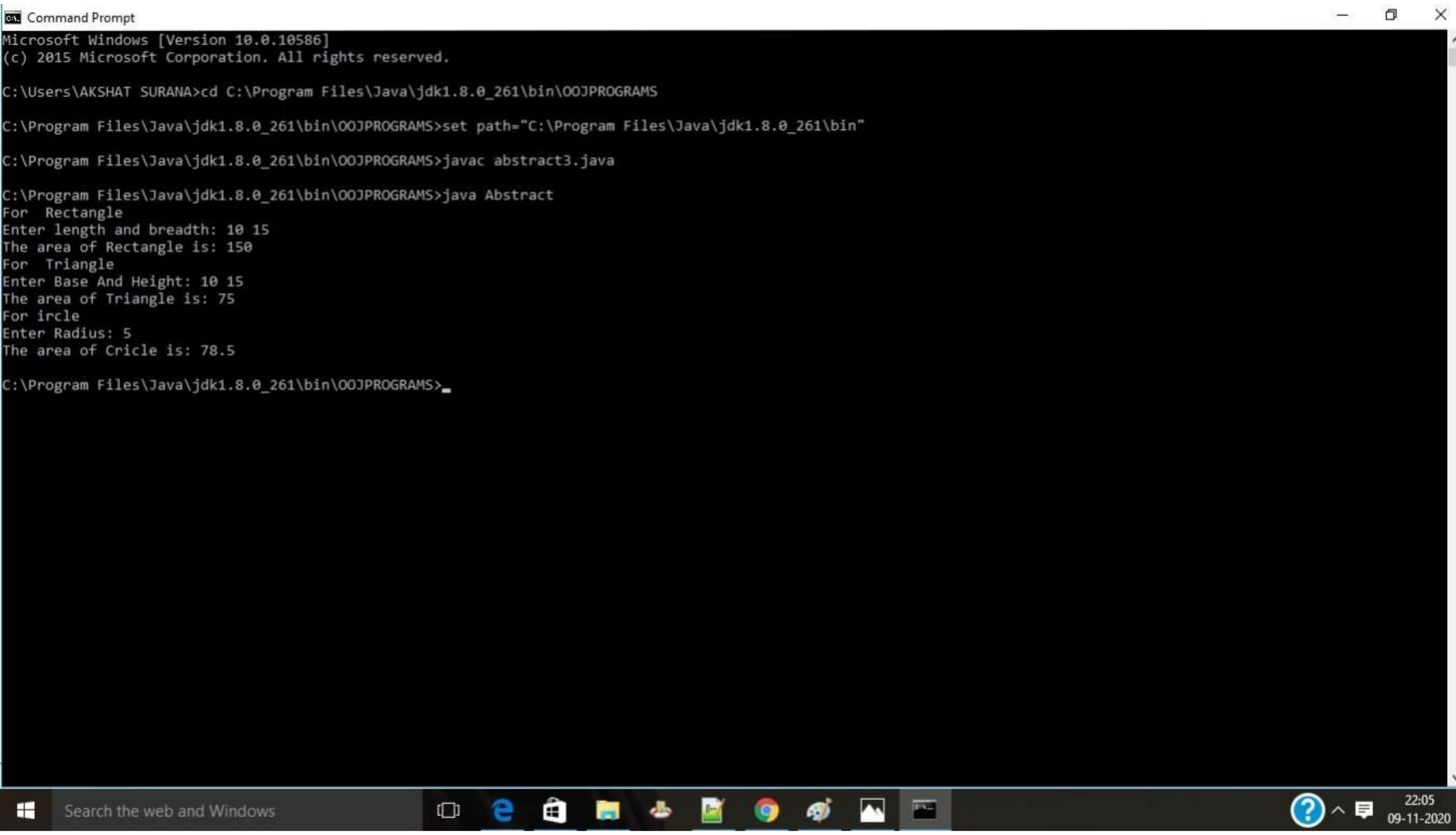
```
        System.out.printf(" Enter Base and Height");
            b = input.nextInt();
            h= input.nextInt();
        }
}
class Circle extends Shape
{   void printArea()
        { System.out.println(" FOR CIRCLE");
        System.out.println(" Enter Radius:");
        r= input.nextInt();
        System.out.println(" The area of Circle is
                            " +3.14f*r*r );
        }
}
class Abstract
{
  public static void main (String args[])
    {
      Rectangle r = new Rectangle();
        r. printArea();
        Triangle t = new Triangle();
        t. printArea();
        Circle c = new Circle();
         c. printArea();
    }
}
```

Scanned by TapScanner



(0-5) Develop a Java Program to create a class Bank that maintains two kinds of account for its customers, one called the savings account and the other current account. The savings account provides compound interest & 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 & if the balance falls below the level, a service charge is imposed. Create a class Account that stores customer name, account number and type of account. From these derive the classes Cur-act and Sav-act to make them more specific to their requirements. Include the necessary methods in order to achieve following task

- Accept deposit from customer & update the balance • Display the balance • Compute and deposit interest • Permit withdrawal & update the balance • Check for the minimum balance, impose penalty if necessary & update the balance.

Anshul H. Sucan

```
import java.util.Scanner;
import java.lang.Math;

class Account
{ String name, type, accno;
  double balance;

  void deposit()
  { Scanner get = new Scanner(System.in);
    double depo;
    System.out.println("Enter deposit:");
    depo = get.nextDouble();
    balance = balance + depo;
  }
  void withdraw()
  { Scanner get = new Scanner(System.in);
    double withdraw;
    System.out.println("Enter the amount
                        to withdraw:(<"+balance+
    withdraw = get.nextDouble();
    balance = balance - withdraw;
    System.out.println("Balance:"+balance);
  }
}

class Curr_acct extends Account
{ int intr = 6;
  boolean cheque = true;
  void dispblnc()
{ System.out.println("Balance:"+balance);
  }
  void create()
{
```

Anshul M. Suvana

```
{ Scanner get = new Scanner (System.in);
  System.out.println ("Name:");
  name = get.next();
  accno = "current";
  System.out.println ("Account No:");
  accno = get.next();
  System.out.println ("Balance:");
  balance = get.nextDouble();
}
void check()
{ System.out.println("\n Minimum Balance:"+
                                    5000);
   if (balance < 5000)
   {
     System.out.println ("Penalty is
      imposed please deposit minimum"
   +(5000-balance+200)+" Rs\nRs
                    200 Service charge");
     deposit();
     balance = balance - 200;
   }
   else
   { System.out.println("Balance:"+balance
                              "Safe"); }
}
class Sav_acct extends Account
{ double intr = 7;
    boolean cheque = false;
      void displbnc()
{ System.out.println("Balance:"+balance
}
```

Ayshu H. Suana

```
void Create()
{ Scanner get = new Scanner(System.in);
  System.out.println("Name:");
  name = get.next();
  accno = "savings";
  System.out.println("Account No:");
  accno = get.next();
  System.out.println("Balance:");
  balance = get.nextDouble();
}
void calcint()
{ double interest;
  Scanner get = new Scanner(System.in);
  System.out.println("Enter time:");
  int time;
  time = get.nextInt();
  interest = balance * Math.pow(1+intr/100,
                                time) - balance;
  System.out.println("Interest:"+interest);
  balance = balance + interest;
  System.out.println("Balance:"+balance);
}
}
class Bank
{ public static void main(String args[])
  { Scanner get = new Scanner(System.in);
    String type;
    Sav_acct accs = new Sav_acct();
    Curr_acct accr = new Curr_acct();
    System.out.println("Enter type of account
                       (current/savings)");
    type = get.next();
```

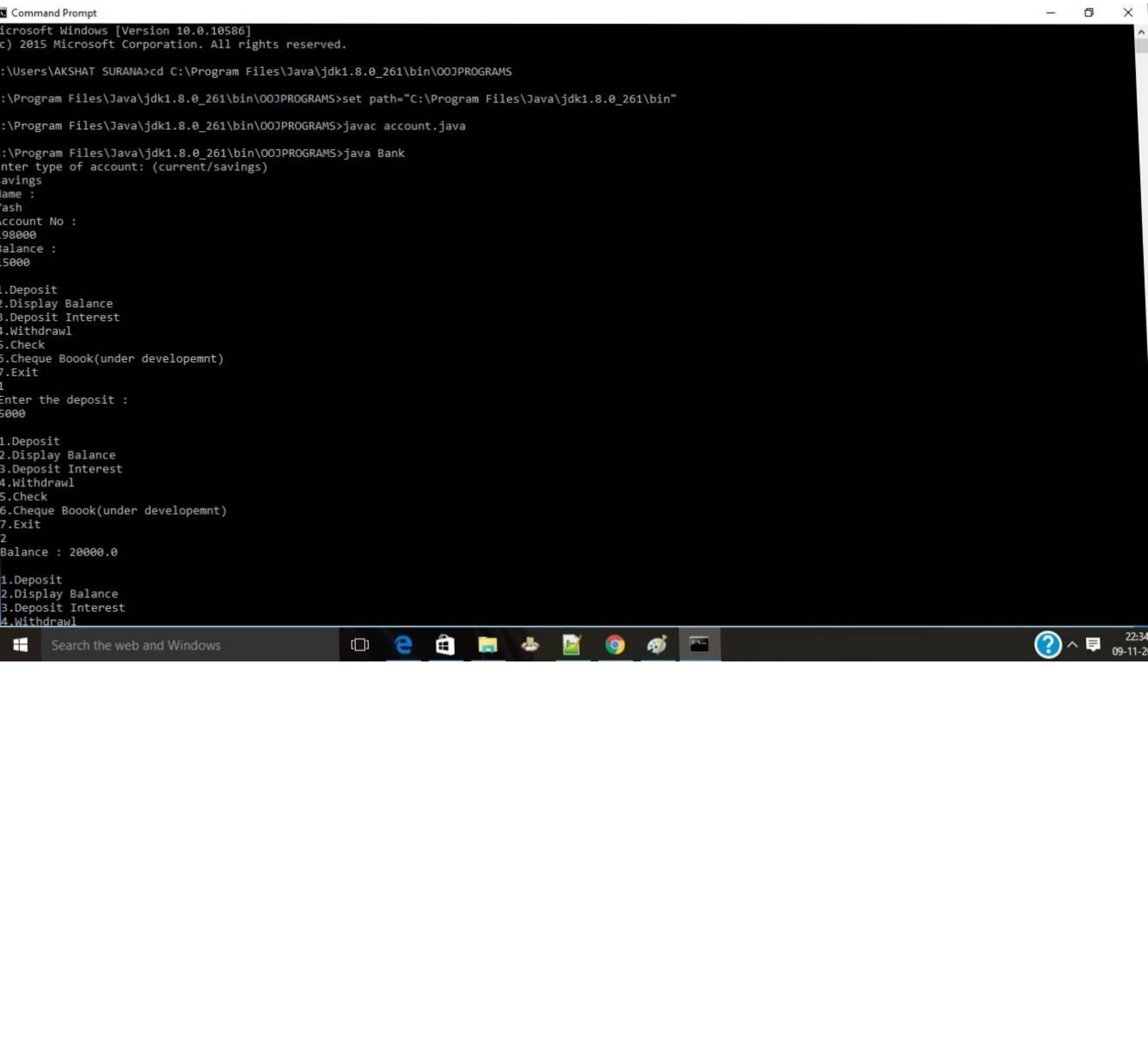
Arshad H. Surana

```
if (type.equals ("savings"))
    accs.create();
 else if (type.equals ("current"))
    acct.create();

int ch;
do
{ System.out.println ("\n1. Deposit \n2. Displ
        Balance \n3. Deposit Interest
  \n4. Withdraw \n5. Check \n6. Cheque
                BOOK(under development)
                  \n7. Exit");
   ch= get.nextInt();
   switch (ch)
 { case 1: if (type.equals ("savings"))
          accs.deposit();
        else
          acct.deposit();
          break;
  case 2: if (type.equals ("savings"))
          accs.displbInc();
        else
          acct.displbInc();
          break;
  case 3: if (type.equals ("savings"))
          accs.calcint();
          else
  System.out.println("This account does
                not have this provision");
          break;
  case 4: if (type.equals ("savings"))
          accs.withdraw();
          else
```

Anshul H. Swamy

```
        acct.withdraw();
        break;
case 5: if(type.equals("saving"))
        System.out.println("This account
                    does not have
                this provison");
        else
            acct.check();
        break;
case 6: if(type.equals("saving"))
        System.out.println("This account
                    does not have provison");
        break;
default: if(ch!=7)
        System.out.println("Enter valid
                                option");
}

while(ch!=7);
}
```

Arshul H. Suvarna.



Select Command Prompt

```
5000

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
2
Balance : 20000.0

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
3
Enter time:
3
Interest : 4500.860000000001
Balance : 24500.86

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
4
Enter the amount to withdraw: (<24500.86)
4000
Balance : 20500.86

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
```

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Select Command Prompt

```
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
4
Enter the amount to withdraw: (<24500.86)
4000
Balance : 20500.86

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
5
This account does not have this provision

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
6
This account does not have this provision

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
7

C:\Program Files\Java\jdk1.8.0_261\bin\OOJPROGRAMS>javac account,java
javac: invalid flag: account,java
Usage: javac <options> <source files>
use -help for a list of possible options
```

Select Command Prompt

```
Usage: javac <options> <source files>
use -help for a list of possible options

C:\Program Files\Java\jdk1.8.0_261\bin\OOJPROGRAMS>java Bank
Enter type of account: (current/savings)
current
Name :
Yash
Account No :
159901
Balance :
10000

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
1
Enter the deposit :
5000

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
2
Balance : 15000.0

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
3
This account does not have this provision
```

Select Command Prompt

```
This account does not have this provision

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
4
Enter the amount to withdraw: (<15000.0)
5000
Balance : 10000.0

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
5

Minimum Balance : 5000
Balance : 10000.0Safe

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
6
This account does have this provision

1.Deposit
2.Display Balance
3.Deposit Interest
4.Withdrawl
5.Check
6.Cheque Boook(under developemnt)
7.Exit
7
```