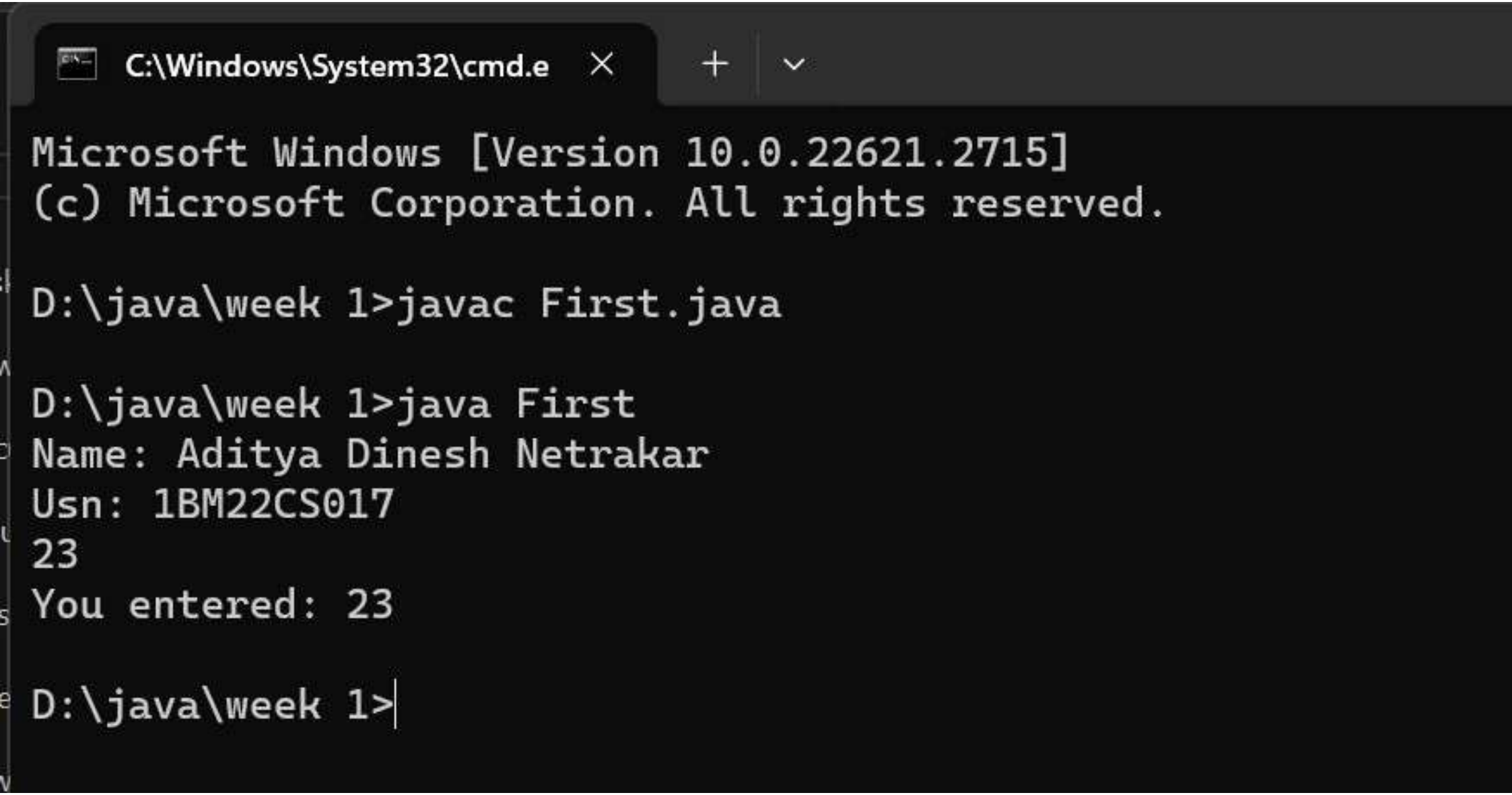
Week - 1

1) Write a Java Program to Print an integer.

```
import java.util.Scanner;
public class First {
    public static void main(String[] args){
        Scanner in = new Scanner(System.in);
        System.out.print("Enter a number: ");
        int number = in.nextInt();
        System.out.println("You entered: "+
                                    number);
    }
}
```


C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22621.2715]
(c) Microsoft Corporation. All rights reserved.
D:\java\week 1>javac First.java
D:\java\week 1>java First
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
23
You entered: 23
D:\java\week 1>

2) Java Program to check whether a number is Even or Odd.

```
import java.util.Scanner;
public class Demo{
    public static void main(String[] args)
    {
        int num;
        System.out.print("Enter an Integer
                          number: ");
        Scanner in = new Scanner(System.in);
        num = in.nextInt();
```

```
        if (num % 2 == 0)
            System.out.println(num + " is an
                                    even number");
        else
            System.out.println(num + " is an odd
                                    number");
    }
}
```

Output:

```
Enter an integer number
2
2 is an even number.
```

```
D:\java\week 1>javac Second.java

D:\java\week 1>java Second
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
Enter an Integer number: 12
12 is an even number

D:\java\week 1>javac Second.java

D:\java\week 1>java Second
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
Enter an Integer number: 7
7 is an odd number

D:\java\week 1>
```

3) Java Program to Print Right Triangle star Pyramid.

```
public class Third{
    public static void main(String[] args){
        int row, column, n=8;
        for(row=0; row<n; row++)
        {
            for(column=0; column<=row; column++)
            {
                System.out.print("* ");
            }
        System.out.println();
        }
}
}
```

```
D:\java\week 1>javac Third.java

D:\java\week 1>java Third
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
*
* *
* * *
* * * *
* * * * *
* * * * * *
* * * * * * *
* * * * * * * *
* * * * * * * * *

D:\java\week 1>
```

4) Java Program to find Quotient & Remainder

```
public class Fourth{
    public static void main(String[] args)
    {
        int num1 = 15, num2 = 2;
        int quo = num1 / num2;
        int rem = num1 % num2;
        System.out.println(" Quotient is: " +
                                quo );
        System.out.println(" Remainder is: " +
                                rem);
    }
}
```

Output

```
D:\java\week 1>javac Fourth.java

D:\java\week 1>java Fourth
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
Quotient is: 7
Remainder is: 1
D:\java\week 1>
```

5) Java Program to Multiply 2 no.s.

```
import java.util.Scanner;
public class Fifth {
    public static void main (String[] args)
    {
        Scanner in = new Scanner(System.in);
        System.out.print("Enter first no: ");
        int n1 = in.nextInt();
        System.out.print("Enter second no: ");
        int n2 = in.nextInt();
        int pro = n1*n2;
        System.out.println("Output: "+pro);
    }
}
```

utput

```
D:\java\week 1>javac Fifth.java

D:\java\week 1>java Fifth
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
Enter two numbers: 12 2
Output is: 24

D:\java\week 1>
```

6) Swap two numbers

```
public class Birth
{
    public ~~class~~ static void main (String[] args)
    {
        float first = 1.20f, second = 1.45f;
        System.out.println("--Before swapping--");
```

```
System.out.println("First no = " + first);
System.out.println("Second no = " + second);
float temp = first;
first = second;
second = temp;
System.out.println("-- After swapping --");
System.out.println("First no = " + first);
System.out.println("Second no = " + second);
}
}
```

```
D:\java\week 1>javac Sixth.java

D:\java\week 1>java Sixth
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
First number= 1.2
Second number= 2.45
After swap
First: 2.45
Second: 1.2

D:\java\week 1>
```

Java code

```
import java.util.Scanner;
import static java.lang.Math.sqrt;
import static java.lang.Math.abs;

public class New{

    public static void main (String[] args){
        Scanner in = new Scanner(System.in);
        System.out.println("Enter coefficients of
            a quadratic equation");
        int a = in.nextInt();
        int b = in.nextInt();
        int c = in.nextInt();
        if(a==0){
            System.out.println("Enter Invalid input")
        }
        else{
            int d = b*b - 4*a*c;
            if(d>0){
                System.out.println("Roots are real");
                float r1 = (float) (-b + sqrt(d))/(2*a);
                float r2 = (float) (-b - sqrt(d))/(2*a);
                System.out.println(r1);
                System.out.println(r2);
            }
```

```
        else if(d<0){
            System.out.println("Roots are
                                imaginary");
            float r1 = (float) -b/(2*a);
            float r2 = (float) sqrt(abs(d))/(2*a);
            System.out.println(r1 + "+ i" + r2);
            System.out.println(r2 + "- i" + r2);
        }
        else{
            System.out.println("Roots are equal");
            float r = (float) -b/(2*a);
            System.out.println(r);
        }
    }
}
```

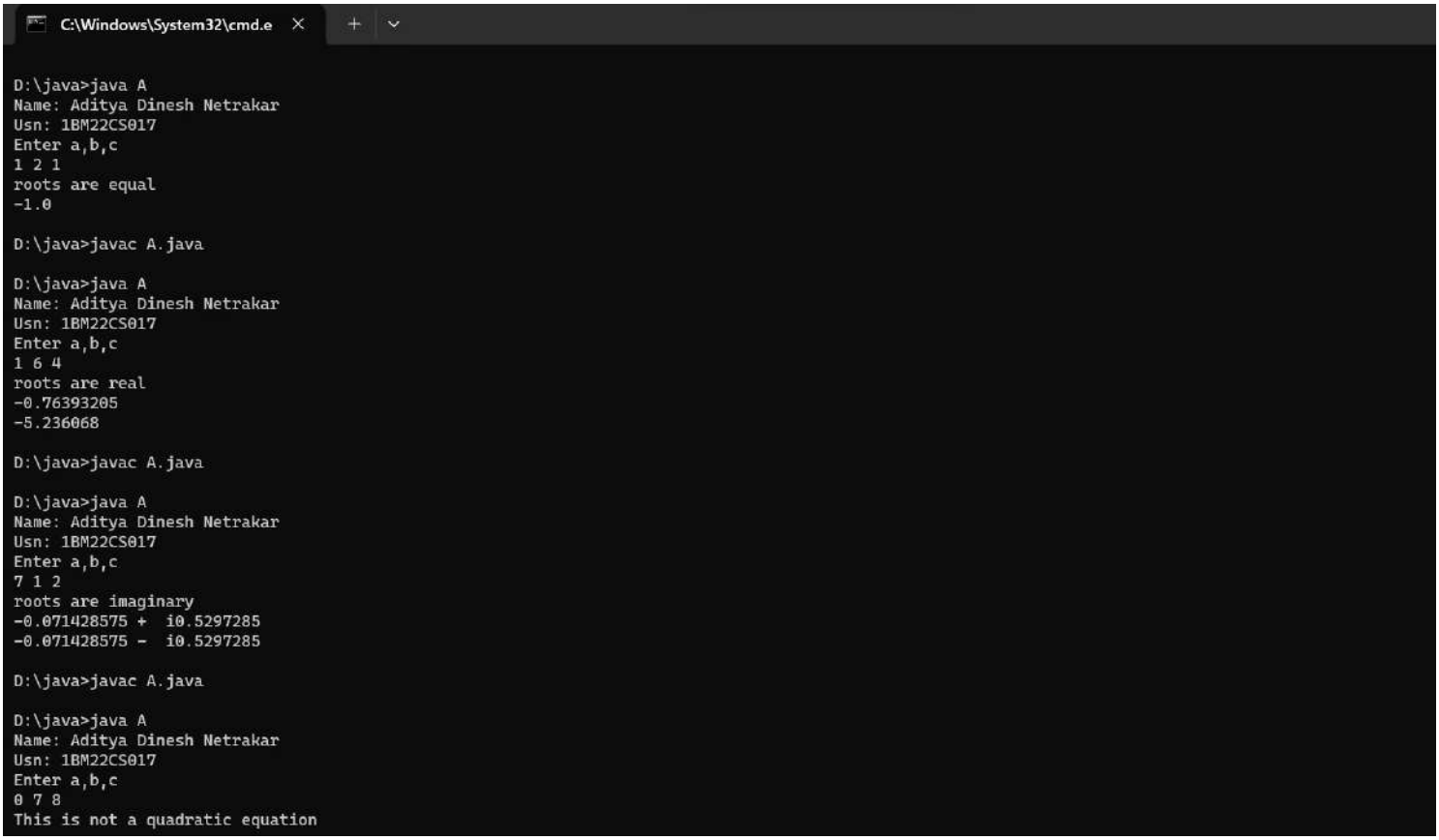
Output:

→Enter the coefficients of a quadratic equation
1 6 4
Roots are real
-0.7639320
-5.236068

→Enter the coefficient of a quadratic equation
1 2 1
Roots are real and equal
-1.0

→Enter the coefficients of a quadratic equation
7 1 2
Roots are imaginary
-0.0714285 + i 0.52972
-0.0714285 - i 0.52972

Enter the coefficients of a quadratic equation
0 7 8
Invalid input.


C:\Windows\System32\cmd.e
D:\java>java A
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
Enter a,b,c
1 2 1
roots are equal
-1.0
D:\java>javac A.java
D:\java>java A
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
Enter a,b,c
1 6 4
roots are real
-0.76393205
-5.236068
D:\java>javac A.java
D:\java>java A
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
Enter a,b,c
7 1 2
roots are imaginary
-0.071428575 + i0.5297285
-0.071428575 - i0.5297285
D:\java>javac A.java
D:\java>java A
Name: Aditya Dinesh Netrakar
Usn: 1BM22CS017
Enter a,b,c
0 7 8
This is not a quadratic equation

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

```
public class student{
    string usn,name;
    int i=0;
    private int[] credit={4,4,3,3,3,1,1,1};
    public student(){
        this.usn="1BM21CS017";
        this.name="Aditya";
    }
    public double sgpa(int[] arr){
        double marks=0, sgpa=0;
        for(i=0;i<arr.length;i++){
            marks=(credit[i]*(int)arr/10+1));
        }
        sgpa=marks/20;
        return sgpa;
    }
}
import java.util.Scanner;
public class student{
    string usn;
    string name;
    int i=0;
    private static int[] credit={4,4,3,3,3,1,1,1};
    Scanner in=new Scanner(System.in);
    public void first(){
        System.out.println("Enter your USN: ");
        usn=in.next();
        System.out.println("Enter name: ");
        name=in.next();
    }
```

```
public double res(int[] arr){
    double sgpa=0, marks;
    for(i=0; i<arr.length; i++){
        if (arr[i] >=100){
            arr[i] = arr[i]-10;
        }
        else if (arr[i] < 40){
            arr[i] = 0;
        }
        marks += credit[i] * ((arr[i]/10)+1);
    }
    sgpa= marks/20;
    return sgpa;
}
public void display(double result){
    System.out.println("SGPA = " + result);
}
}
public class Main{
import java.util.Scanner;
public class Main{
    public static void main(String[] args){
        Scanner in = new Scanner(System.in
        int[] arr = new int[8];
        Student s1 = new Student;
        s1.first();
        System.out.println("Enter marks:
        for(int i=0; i<8; i++){
            arr[i] = in.nextInt();
        } s1.result;
        double result = s1.res(arr);
        s1.display(result);
    }
}
```

Algorithm:

~~Start:~~ Start Step 1 : Start
Step 2 : Initialize variable arr[], marks, usn, name, sgpa.
Step 3 : Calling class Student in which calling function first();
Step 4 : Input; "Enter usn " + usn
Step 5 : Input: "Enter name " + name
Step 6 : Print "Enter marks"
Step 7 : ~~Rea~~ for(i=0; i<8; i++){
arr[i] = in.nextInt();
}
Step 8 : Read array credits as {4,4,3,3,3,1,1,1}
Step 9 : for(i=0; i<arr.length; i++){
if(arr[i]>=100){
arr[i] = arr[i]-10;
}
else if(arr[i]<40){
arr[i] = 0;
}
marks += credit[i] * ((arr[i]/10)+1)
}
Step 10 : sgpa = marks/20
Step 11 : Print "SGPA = " + sgpa
Step 12 : Stop

Output:

Enter your usn : 1BI22CS017
Enter name : Aditya.
Enter marks:
90 93 84 87 83 90 96 100
SGPA : 9.55

29/12/23

```
D:\java>javac B.java

D:\java>java B
Name: Aditya Dinesh Netrakar
USN: 1BM22CS017
Enter your usn: 1BM22CS017
Enter your name: Aditya
Enter the total marks:
90 93 84 87 83 90 96 100
SGPA: 9.55

D:\java>
```

Details of a Book (Input & display of the details of book using toString())

```
import java.util.Scanner;
class Books{
    String name;
    String author;
    int price;
    int num_pages;
    public void set(int i){
        Scanner in = new Scanner(System.in);
        System.out.println("Enter details of book "
        +(i+1)+" in name, author, price, num_pages
        order");
        name = in.next();
        author = in.next();
        price = in.nextInt();
        num_pages = in.nextInt();
    }
    public String toString(int i){
        return "Details of Book " + (i+1) + "\n" +
        "Name : " +name + "\n" +
        "Author = " +author + "\n" +
        "Price : " +price + "\n" +
        "No. of pages : " + num_pages;
    } public void get(int i){
        String S = toString(i);
        System.out.println(S);
    }
}
class Main{
    public static void main(String[] args){
        int n;
        Scanner in = new Scanner(System.in);
        System.out.println("Enter number of book
        n = in.nextInt();
        Books b[] = new Books[n];
        for(int i=0; i<n; i++){
            b[i] = new Books();
            b[i].set(i);
        }
        System.out.println();
```

```
for(int i=0 ; i<n ; i++){
    System.out.println(b[i].getString(i));
}
}
}
```

Algorithm:

Step 1 : Start

Step 2 : Initialize variable under structure

```
struct Book{
    String name;
    String author;
    int price;
    int num_pages;
};
```

Step 3 : ~~for(i=0 ; i<n ; i++~~ Read n.

Step 4 : for(i=0 ; i<n ; i++){

Print "Enter details of the book"

~~name = in.next()~~ Read b.name[i]

b.author[i], b.price[i], b.num_pages[i]

} continue until it breaks the loop.

Step 5 : Print "Display details of books"

```
for (i=0 ; i<n ; i++){
    Print "Name   " + b.nam[i]
    Print "Author   " + b.author[i]
    Print "Price :   " + b.price[i]
    Print "No. of pages :" + b.num_pages[i]
}
```

~~Step 6 : Stop.~~

Step 6 : Stop.

Enter number of books:
2
Enter details of book1 in name, author, price, num_pages order
ajhjd spb 299 90
Enter details of book2 in name, author, price, num_pages order
dbth ejc 300 200

Display:
Details of Books1
Name ajhjd
Author spb
Price 299
No. of pages 90

Details of Books2
Name dbth
Author ejc
Price 300
No. of pages 200

Develop a Java program to create an abstract class to find the area of Rectangle, Triangle and circle.

```
import java.util.Scanner;
abstract class Shape{
    int a, b;
    abstract void printArea();
}
class Rectangle extends Shape{
    Rectangle(int l, int br){
```

```
Microsoft Windows [Version 10.0.22621.2715]
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D:\java\oops>javac D.java

D:\java\oops>java D
Name: Aditya Dinesh Netrakar
USN: 1BM22CS017
Enter number of books
2
Enter details of books 1 in name,author,price,num_pages order
ajhjd spb 299 90
Enter details of books 2 in name,author,price,num_pages order
dbfh eje 300 200

Details of Book 1
Name: ajhjd
Author: spb
Price: 299
No of pages: 90
Details of Book 2
Name: dbfh
Author: eje
Price: 300
No of pages: 200
```

Develop a Java program to create an abstract class to find the area of Rectangle, Triangle and circle.

```
import java.util.Scanner;
abstract class Shape{
    int a, b;
    abstract void printArea();
}
class Rectangle extends Shape{
    Rectangle(int l, int br){
        a = l;
        b = br;
    }
```

```
    public void printArea(){
        System.out.println("Area of Rectangle = "+l*b);
    }
}

class Triangle extends Shape{
    Triangle(int ba, int h){
        a = ba;
        b = h;
    }
    public void printArea(){
        System.out.println("Area of t
        double area = 0.5 * a * b;
        System.out.println("Area of Triangle "+
                area);
    }
}

class Circle extends Shape {
    Circle(int r){
        double area = 3.14 * r
        a = r
    }
    public void printArea(){
        double area = 3.14 * r * r;
        System.out.println("Area of the Circle "
            + area);
    }
}

class Main{
    public static void main(String[] args){
        Scanner in = new Scanner(System.in);
        System.out.println("Enter the
            sides of a Rectangle");
        Rectangle rec = new Rectangle
                (in.nextInt(), in.nextInt
        rec.printArea();
        System.out.println("Enter the base
            and height of a triangle");
        Triangle tri = new Triangle
                (in.nextInt(), in.nextInt()
        tri.printArea();
```

```
        System.out.println("Enter the radius
                of a circle ");
        Circle cir = new Circle(in.nextInt());
        cir.printArea();
    }
}
```

Algorithm:

Step 1: Start

Step 2: ~~Init~~ Create Abstract class Shape in which initialize variable a & b.

Step 3: Call for printArea() function in abstract class

Step 4: Enter length & breadth of a rectangle (l, br) under class Rectangle extends Shape;

Print "Area of rectangle " + l * br.

Step 5: Read base(ba) and height(h) of a triangle under class ~~Triangle~~ extends Shape

a = ba b = h

Print "Area of ~~triangle~~ Triangle: " + (0.5 * b * h)

Step 6: Read radius (r) of a circle under class Circle ~~of~~ extends Shape

a = r

Print "Area of circle = " + (3.14 * r * r

Step 7: Stop.

Output:

Enter the length and breadth of a rectangle:

3 4

Area of rectangle: 12.0

Enter the base and height of a triangle:

4 10

Area of Triangle = 20.0

Enter the radius of circle.

7

Area of circle = 153.86

12/01/24

```
Microsoft Windows [Version 10.0.22621.2715]
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D:\java\oops>javac E.java

D:\java\oops>java E
Name: Aditya Dinesh Netrakar
USN: 1BM22CS017
Enter length and breadth of a rectangle:
3 4
Area of rectangle: 12
Enter base and height of a triangle:
4 10
Area of the triangle: 20.0
Enter the radius of a circle:
7
Area of Circle: 153.86
```

→ Bank - Current & Savings Account.

Develop a Java program to create a class Bank that maintains 2 kinds of account

```
import java.util.Scanner;
class Account{
    String cust_name;
    int accno;
    String acc_type;
    double balance;
    public Account(String cust_name, int
    accno, String acc_type){
        this.cust_name = cust_name;
        this.accno = accno;
        this.acc_type = acc_type;
        this.balance = 0;
    }
    public void displayBal(){
        System.out.println("Account number: "+accno);
        System.out.println("Customer name: "+custname);
        System.out.println("Account type: "+acc_type);
        System.out.println("Balance: "+balance);
    }
}
class Current extends Account{
    double min_balance, service_charge;
    Current(String cust_name, int accno){
        super(cust_name, accno, "Current");
        this.min_balance = 500;
        this.service_charge = 20;
    }
    public void withdrawal(double amt){
        if(balance-amt >= min_balance){
            balance -= amt;
            System.out.println("Withdrawal
successful. Current Balance: "+balance);
        }else{
            balance -= service_charge;
        }
    }
}
```

```
class Savings extends Account {
    double interest_rate;
    Savings(String cust_name, int accno){
        super(cust_name, accno, "Savings");
        this.interest_rate = 0.5;
    }
    public void DepositInterest(){
        balance += balance * interest_rate;
        System.out.println("Interest Deposited
        Current Balance = " + balance);
    }
    public void compoundInterest(double initial_amt,
        int time){
        double ci = initial_amt * Math.pow((1+in-
                                    terest_rate), time)
                        - initial_amt;
        balance += ci;
        System.out.println("Compound interest
        is applied. Current Balance: " + balance);
    }
}
public class Bank {
    public static void main(String[] args){
        Scanner in = new Scanner(System.in);
        System.out.println("Choose account type ");
        System.out.println("1. Savings 2. Current");
        System.out.println("Enter choice 1 or 2 ");
        int choice = in.nextInt();
        System.out.println("Enter customer name");
        String cust_name = in.next();
        System.out.println("Enter account number");
        int accno = in.nextInt();
        System.out.println
        if(choice == 1){
            Savings saveAcc = new Savings(cust_name,
                                        accno);
            System.out.println("Enter initial
                                balance");
```

```
double initial_balance = in.nextDouble();
savAcc.balance = initial_balance;
System.out.println("Enter withdrawal
        amount");
double withdrawal = in.nextDouble();
savAcc.balance = withdrawal;
System.out.println("Withdrawal
successful. Current balance: " +
        savAcc.balance);
System.out.println("Enter time
to calculate compound interest:");
int time = in.nextInt();
savAcc.CompoundInterest(initial_balance,
        time);
savAcc.displayBal();
}
else if(choice==2){
Current curAcc = new Current(cust_name,
                        acno);
System.out.println("Enter initial
                        balance");
double initial_balance = in.nextDouble();
curAcc.balance = initial_balance;
System.out.println("Enter withdrawal
amount:");
double amt = in.nextDouble();
curAcc.withdrawal(amt);
curAcc.ServiceCharge();
curAcc.displayBal();
}
else{
System.out.println("Invalid choice");
}
}
}
```

Flowchart:

Step 1 : Start
Step 2 : Initialize variable cust_name, accno, acc_type, balance.
Step 3 : Input = "Enter customer name " + cust_name
Step 4 : Input - "Enter account number" + accno
Step 5 : Input - "Enter account type" + acc_type
Step 6 : Input - "Enter balance " + balance.
Step 8 : Print " Enter account type :
1. Saving 2. Current "
Step 7 : Input - "Enter choice 1 or 2 "
Step 8 : if (choice ==)
Step 9 : Read choice
Step 10 : if (choice == 1) {
Input - "Enter initial balance" + initial_balance
Input - "Enter withdrawal amount" + withdrawal.
Input if (initial Input "Enter minimum balance " + min.
if (initial_balance - withdrawal >= min)
{
balance -= withdrawal;
}
Print "Current Balance " + balance
Input "Enter interest_rate " + rate
Input "Enter time " + time
ci = initial_balance * power (1 + interest rate), time)
- initial_balance.
Print " Compound Interest : " + ci
Print " Depsit with Interest " +
(balance + balance * interest_

Step 11 : else if (choice == 2) {
Print "Input :" "Enter initial_balance"
, initial_balance
balance = initial_balance;
Input " Enter withdrawal amount" +
if withdrawal.
if (balance - withdrawal) >= min) {
balance -= withdrawal;
}
Print " Current Balance = " + balance
}
Step 12 : else {
Print " Invalid choice "
}
Step 13 : Stop

Output :
Choose account type
1. Saving 2. Current
Enter choice 1 or 2
1
Enter customer_name
adb
Enter account number :
001
Enter initial balance :
10000
Enter withdrawal amount
1000
Current balance = 9000.0
Enter time(in years) for compound interest calculation.
3
Compound interest applied = 32750.0

```
D:\java\oops>java F
Name: Aditya Dinesh Netrakar
USN: 1BM22CS017
Choose account type:
1.Savings
2.Current
Enter choice 1 or 2
1
Enter customer name:
adi
Enter account number:
001
Enter initial balance
10000
Enter withdrawl amount
1000
Withdrawl successful. Current balance: 9000.0
Enter interest rate:
3
Account number: 1
Customer name: adi
Account type: Savings
Balance: 9000.0
Enter time(in years) to calculate compund interest:
3
Compound interest applied. Current balance: 639000.0
Account number: 1
Customer name: adi
Account type: Savings
Balance: 639000.0
```

6) Create package CIE, SEE & import the package on main.java file.

```
package CIE;
import java.util.Scanner;
public class student {
    public int sem;
    public String usn;
    public String name;
    public void accept()
    {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter usn: ");
        usn = in.next();
        System.out.print("Enter name: ");
        name = in.next();
        System.out.print("Enter sem: ");
        sem = in.next();
    }
}
```

```
package CIE;
public class Internals {
    public int marks[] = new int[5];
}
```

```
package SEE;
import CIE.student;
public class External extends student {
    public int ext = new int[5];
}
```

Main.java

```
import java.util.*;
import SEE.*;
import CIE.*;
public class Main{
    public static void main(String args[]){
        int final[] = new int[5];
        Scanner in = new Scanner(System.in);
        System.out.println("Enter n = ");
        int n = in.nextInt();
        SEE.External end[] = new SEE.External[n];
        CIE.External
        CIE.Internal in[] = new CIE.Internal[n];
        for(int i=0;i<n;i++){
            end[i] = new SEE.External();
            in[i] = new CIE.Internals();
            System.out.println("Enter details of "
            +(i+1));
            end[i].accept();
            for(int j=0 System.out.println("
            Enter internal & external marks");
            for(int j=0;j<5;j++){
                System.out.println("Course "+(j+1));
                in[i].marks[j] = in.nextInt();
                end[i].ext[j] = in.nextInt();
                final[j] = in[i].marks[j] +
                            end[i].ext[j];
            }
            System.out.println("Final marks
            of "+end[i].name);
            for(int k=0;k<5;k++){
                System.out.println("Course "
                +(k+1)+" = "+final[k]);
            }
        }
    }
}
```

Algorithm:

Step 1: Start

Step 2: Initialize variable name, usn, sem, marks[5], ext[5], final[5]

Step 3: Function; void accept() {
Input: "Enter usn ", usn
Input: "Enter name ", name
Input = "Enter sem ", sem.
}

Step 4: Print "Enter no. of students"

Step 5: Read n

Step 6: Create structure of name, usn, sem & name it as st

Step 7: for(i=0; i<n; i++){
st[i].accept();
~~for~~ Print "Enter internal & external marks respectively"
for(j=0; j<5; j++){
~~for~~ Print "Course "+(i+1)
Read ~~mas~~ st[i].marks[j]
Read st[i].ext[j]
~~for~~ st[i].final[j] = st[i].marks[j] + st[i].ext[j];
}
}

Step 8: print "Final marks"
for(i=0; i<n; i++){
print st[i].name
for(j=0; j<5; j++){
print "Final Course "+(j+1)
print st[j].final[j]
}
}

Step 9: Stop

Output:

Enter n: 1
Enter details of 1
Enter usn: 15
Enter name: jseri
Enter sem: 2
Enter internal external marks
Course 1
23 89
Course 2
23 9
Course 3
45 78
Course 4
34 90
Course 5
35 90
Final mark
Course 1 = 56
Course 2 = 16
Course 3 = 61
Course 4 = 62
Course 5 = 62

02.02.24

```
D:\java\oops>javac Main.java

D:\java\oops>java Main
Name: Aditya Dinesh Netrakar
USN: 1BM22CS017
Enter n:
1
Enter details 1
Enter U, N, S:

17
adi
2
Enter im and sm of sub 1
93 95
Enter im and sm of sub 2
96 90
Enter im and sm of sub 3
96 91
Enter im and sm of sub 4
98 97
Enter im and sm of sub 5
90 95
Final marks of adi
Course 1 = 94
Course 2 = 93
Course 3 = 93
Course 4 = 97
Course 5 = 92

D:\java\oops>
```

Programme:

Write a java program that demonstrate exceptional handling of inheritance tree. Class "father" & derived class "Son".

```
class wrongAge extends Exception {
    public wrongAge(){
        super("Age cannot be negative");
    }
}
class input extends Exception{
    public input(){
        super("wrong input");
    }
}
class Father{
    public int age;
    Father(int age) throws wrongAge {
        if(age>0){
            throw new wrongAge();
        }
        this.age = age;
    }
}
class Son extends Father{
    int s_age;
    Son(int f_age, int s_age) throws wrongAge,
                                     input {
        super(f_age);
        if(f_age<0 && s_age<0){
            throw new wrongAge();
        }
        else if(f_age<=s_age){
            throw new input();
        }
        this.s_age=s_age;
    }
}
public class J{
    public statatic void main(String[] args){
        try{
```

```
try{
    Father f = new Father(40);
    System.out.println("Father's age: "f.age);
    Son s = new Son(40, 50);
    System.out.println("Son's age: " + s.sage);
} catch (wrongAge e){
    System.out.println(e.toString());
}
catch (input ae){
    System.out.println(ae.toString());
}
}
}
```

Algorithm:

Step 1 : Start

Step 2 : Initialize variable f_age, s_age

Step 3 : Create user defined exception

```
class wrongAge extends Exception{
    public wrongAge(){
        super("Age cannot be negative")
    }
}
```

Step 4 : Create another user defined exception

```
class input extends Exception{
    public input(){
        super("wrong input")
    }
}
```

Step 5 : Create class Father{

```
public int age;
Father(int age) throws wrongAge{
    if(age > 0){
        throw new exception wrongAge();
    }
    this.age = age;
}
```

Step 6 : Create class ~~Student~~ Son extends Father{

```
int s_age
Son(int f_age, int s_age) throws wrongAge, input{
    super(f_age);
```

```
        if(f_age<0 && s_age<0){
            throw new wrongAge();
        }
        else if(f_age<=s_age){
            throw new input();
        }
        this.age=s_age;
    }
```

write a program which create 2 thread where one is executed every 10 second & another for 2 second.

```
class One extends Thread{
    public void run(){
        int i=0;
        while(i<2){
            i++;
            try{
                System.out.println("BMS College of
                    Engineering");
                Thread.sleep(10000);
            }catch(Exception e){
                System.out.println(e.toString());
            }
        }
    }
}
class Two extends Thread{
    public void run(){
        int i=0;
        while(i<2){
            i++;
            try{
                System.out.println("CSE");
                Thread.sleep(2000);
            }catch(Exception e){
                System.out.println(e.toString());
            }
        }
    }
```

```
public class I {
    public static void main(String[] args){
        One t1 = new One();
        Two t2 = new Two();
        t1.start();
        t2.start();
    }
}
```

Algorithm:

Step 1 : Start

Step 2 : Initialize variable i = 0

Step 3 : Construct a class One & Two which extends Thread.

Step 4 : Under class One create method run(), under which, while (i < 5){

```
i++
try{
System.out.println("BMS College of Engineering");
Keep Thread in sleep(1000)
}catch (Exception e){
System.out.println ( e.toString().);
}
}
```

Step 5 : Under class Two create method run() under which, while(i<5){

```
i++;
try{
System.out.println("CSE")
} catch(Exception e) {
System.out.println(e.toString())
}
}
```

Step 6 : Create a main class

Call class One t1 = new One();

Call class Two t2 = new Two();

t1.start()

t2.start()

Step 7: Stop

Output:

---

7) Continuation of ~~Lab~~ ~~per~~ algorithm of program 7

Step 7: Call main class I {

try{ calling class, Father f = new Father(40);

~~Son~~ s = ~~new~~ System.out.print("Father's age: "+f.age)

catch class, Son s = new Son(40, 56);

System.out.println("Son's age: "+s.age)

} ~~catch(Exception e){~~

~~System.out.println(e.toString());~~

}

catch (Exception e){

catch (wrongAge w){

System.out.println(w.toString());

}

catch (input i){

System.out.println(i.toString())

}

Step 8: Stop.

Output:

(i) ~~Father's~~ input: Wrong input

(ii) wrongAge: Age cannot be negative

(iii) Father's Age: 40

Son's age: 16

8) Output:

BMS College of Engineering

CSE

CSE

BMS College of Engineering

16.02.24

```
D:\java\oops>javac J.java

D:\java\oops>java J
Program 7
Name: Aditya Dinesh Netrakar
USN: 1BM22CS017
input: Wrong input

D:\java\oops>
```

```
D:\java\oops>javac I.java

D:\java\oops>java I
Program 8
Name: Aditya Dinesh Netrakar
USN: 1BM22CS017
BMS College of Engineering
CSE
CSE
BMS College of Engineering

D:\java\oops>
```