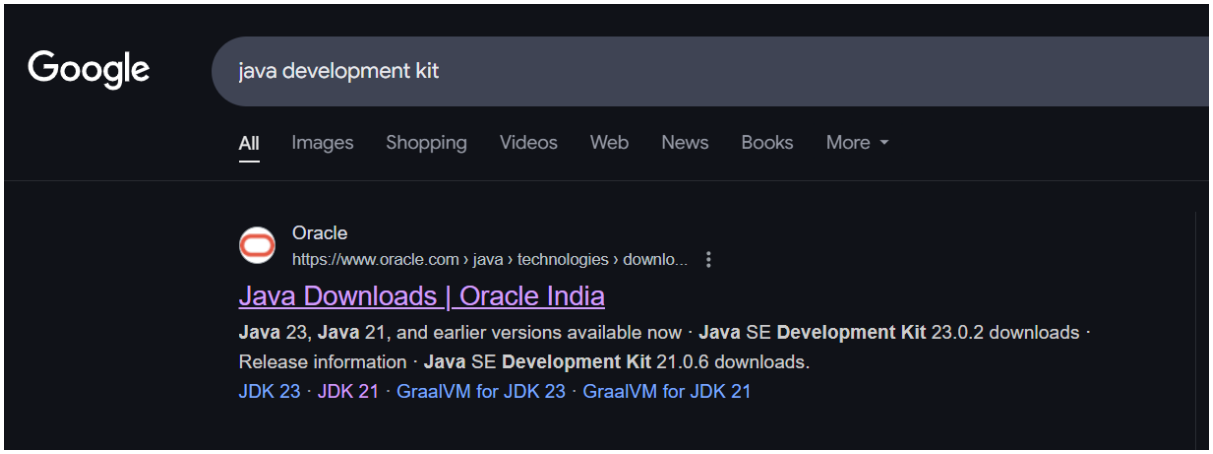
WEEK-1

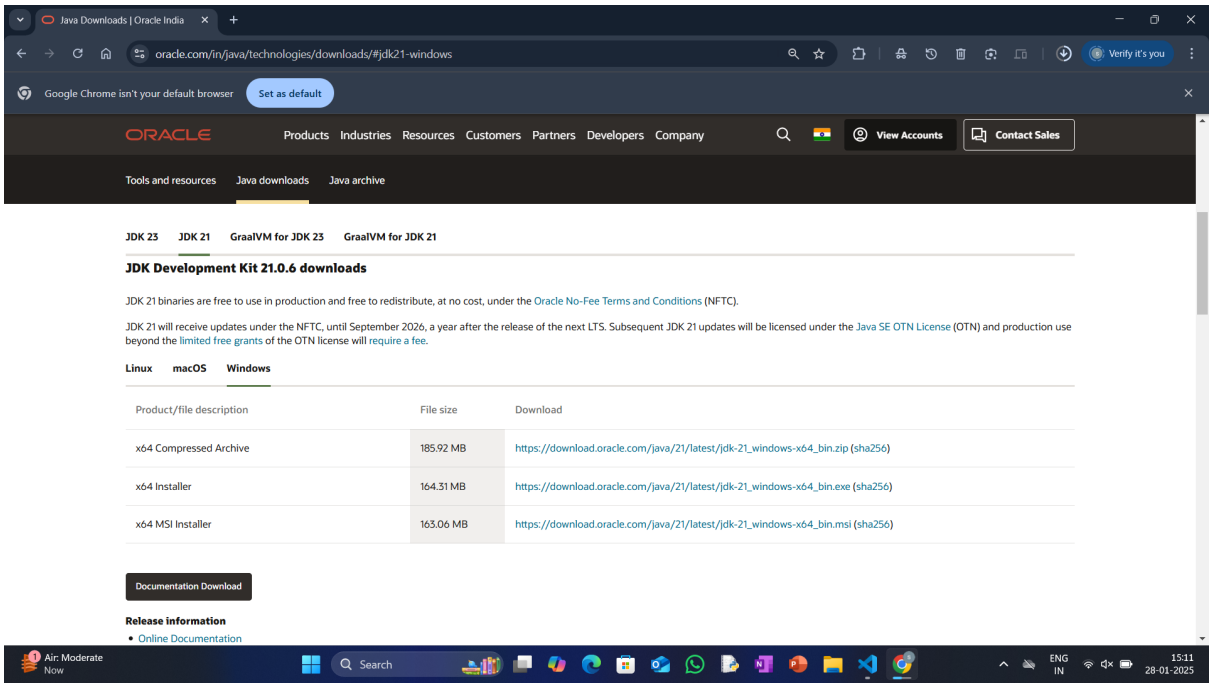
PROGRAME-1

AIM: Download and installation of java

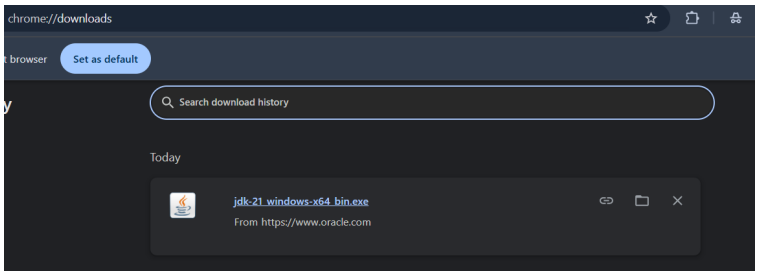
Step 1 : Search for java development kit in chrome to download java



Step 2:Open oracle website. Then select JDK21 and download the type of version for your computer

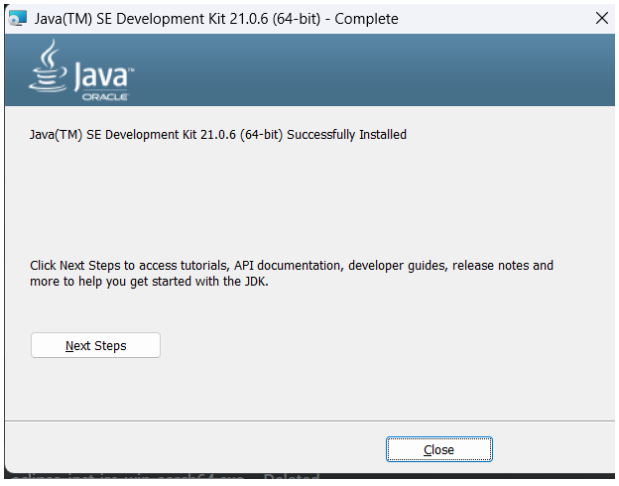


Step 3: after downloading , it will appear like the link below. Click on the link for futher installation of java software.

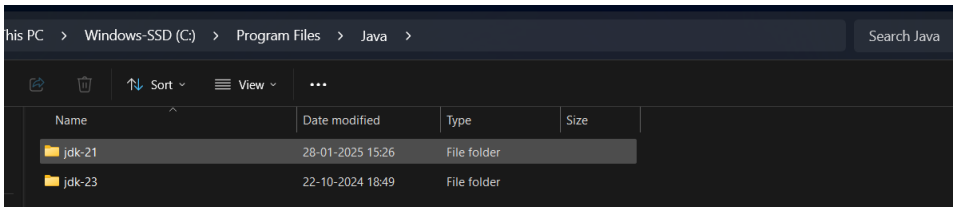


Step 4: click on the next button for futher process of installation of java in computer. At the end section click on next button for final installation.

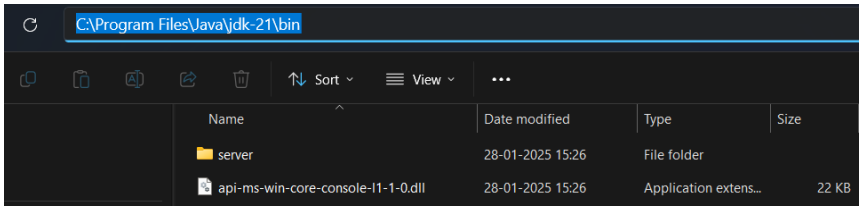
Step 5: at the end section click on the close button to end the installation.



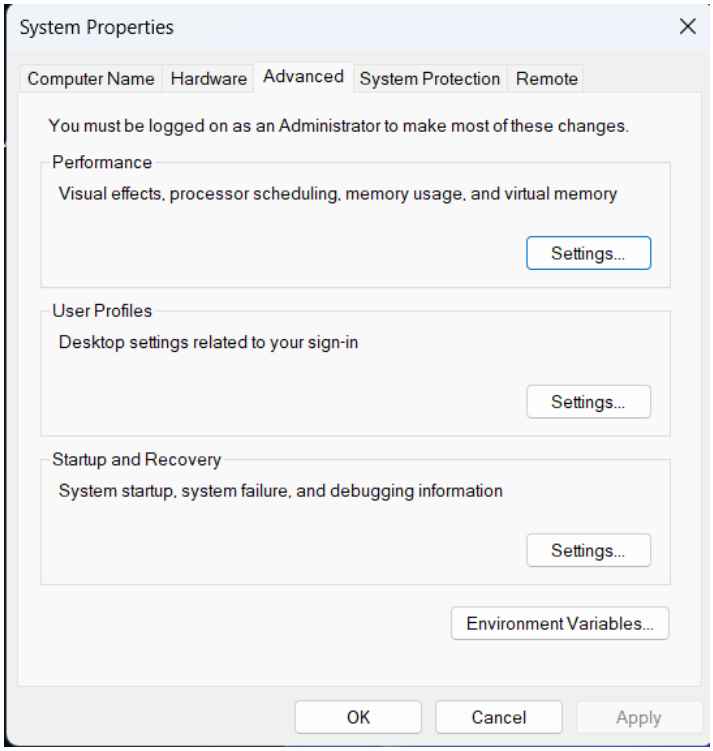
Step6 :to copy the path of the jdk kit in pc go to file manger<< local (c:) <<program files<<java<<jdk 21<<bin .



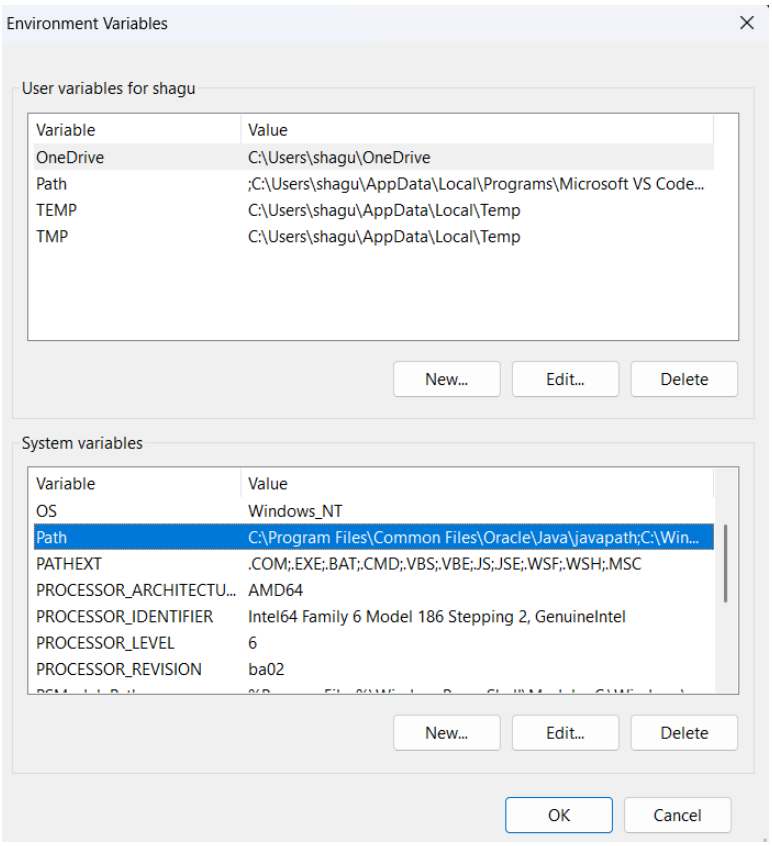
Step 7: copy path on the navigation bar .



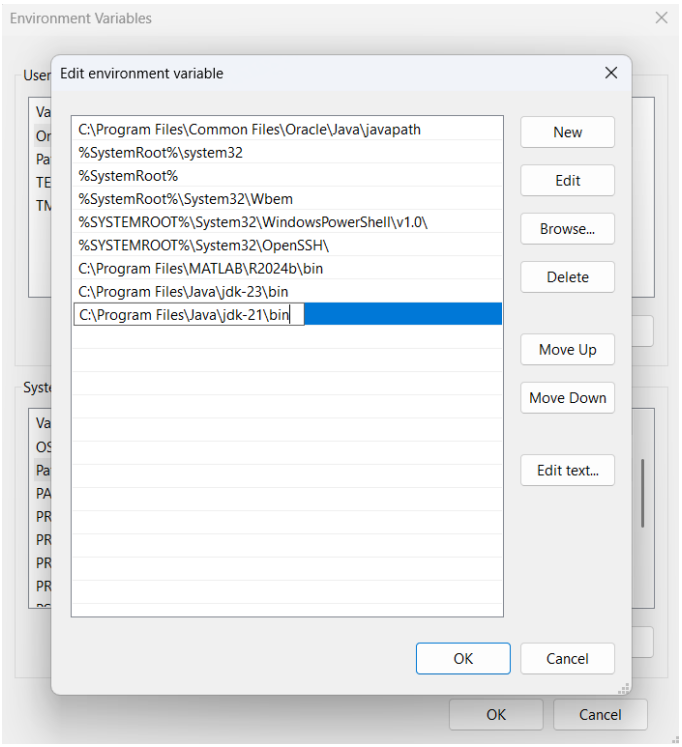
Step 8: now open environmental variables to sset the path in computer.<<click on the environmental variables.



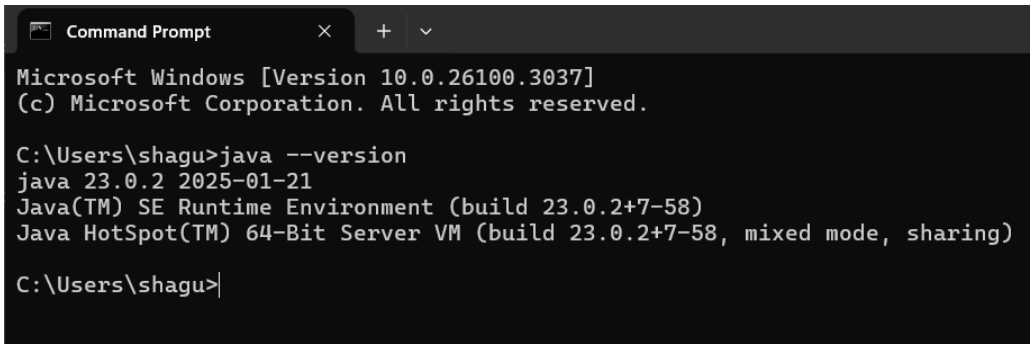
Step 9:after environmental variables another slide will appear of two sections as user variables and system variables<<click on the system variables.<<path<<click on the edit option below .



Step 10:select new << past the path with we have copied on the navigation bar .



Step 11:to check the version installed <<open command prompt<<type java - - version <<enter<<downloaded version will be displayed.



PROGRAM 2:

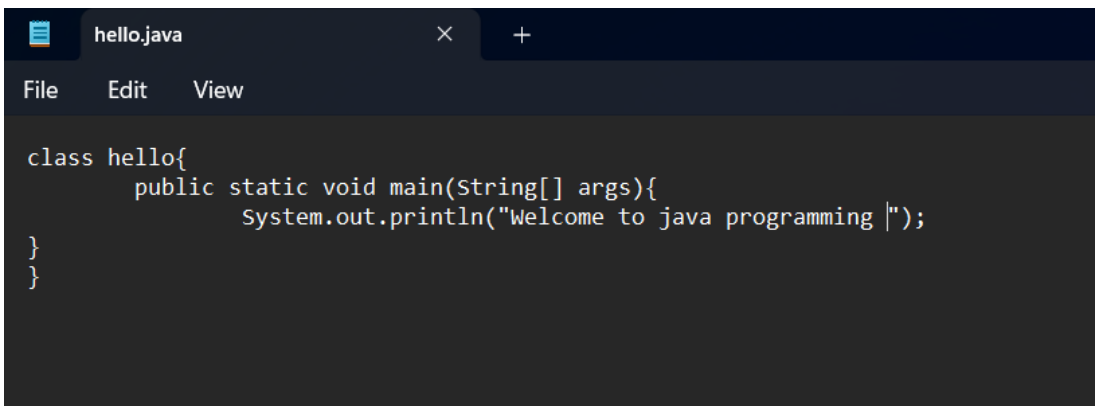
AIM: To write a java program to print the message

"Welcome programming printing ".

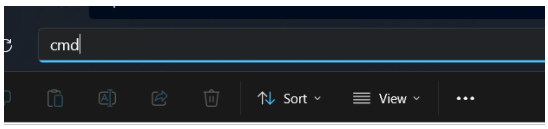
Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<hello.java

CODE:

```
class hello{
        public static void main(String [ ] args){
                System.out.println("Welcome to java programming");
        }
}
```

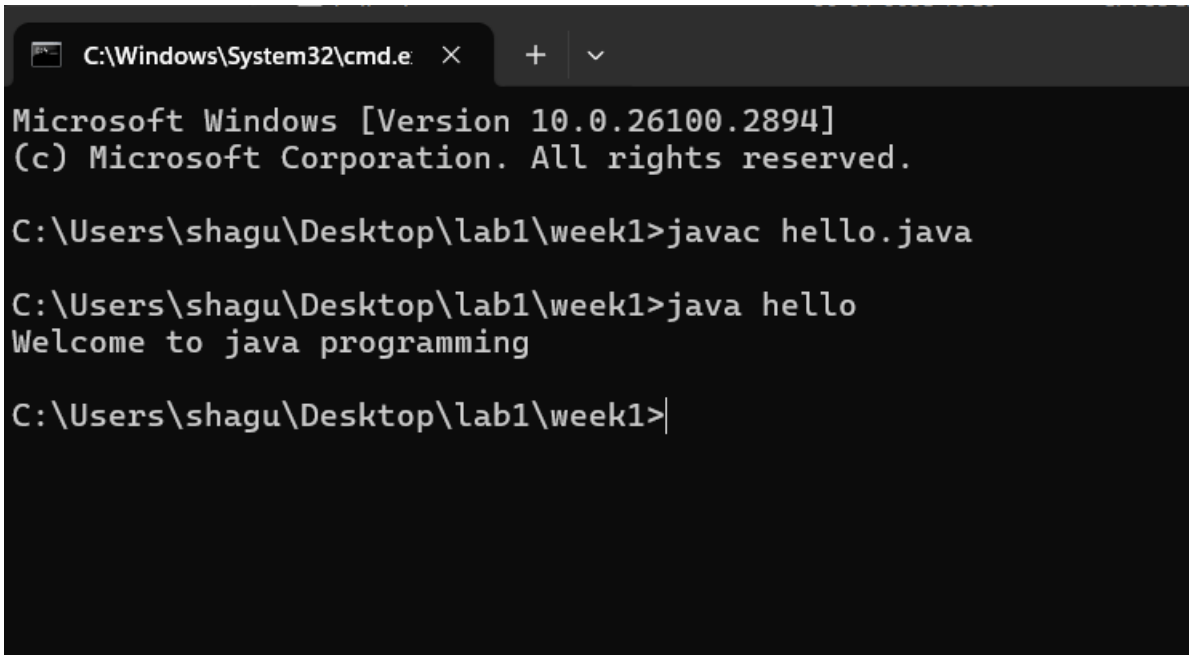


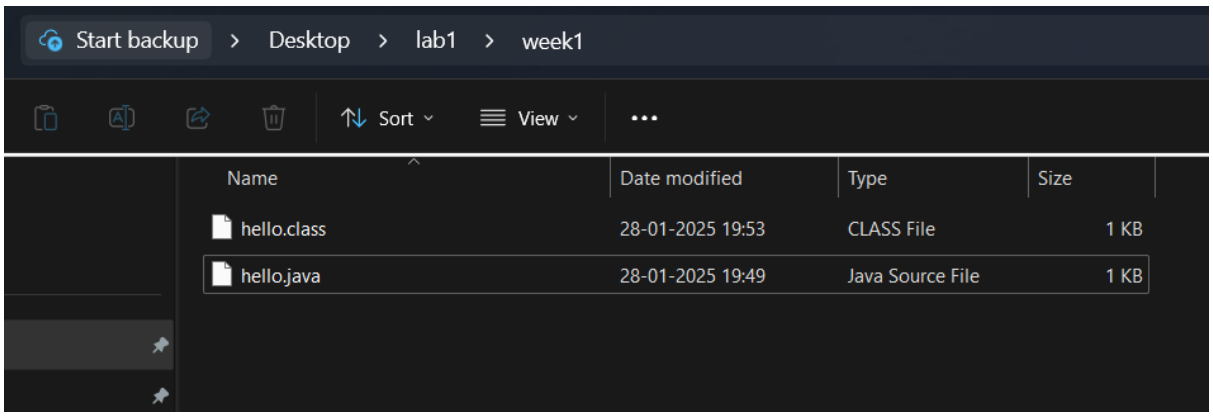
Step 2: to the path clear it and type cmd for running the program.



Step 3:follow commands as: javac hello.java<<enter<<jav hello

The program runs successfully.And creates a java clsss as shown below .





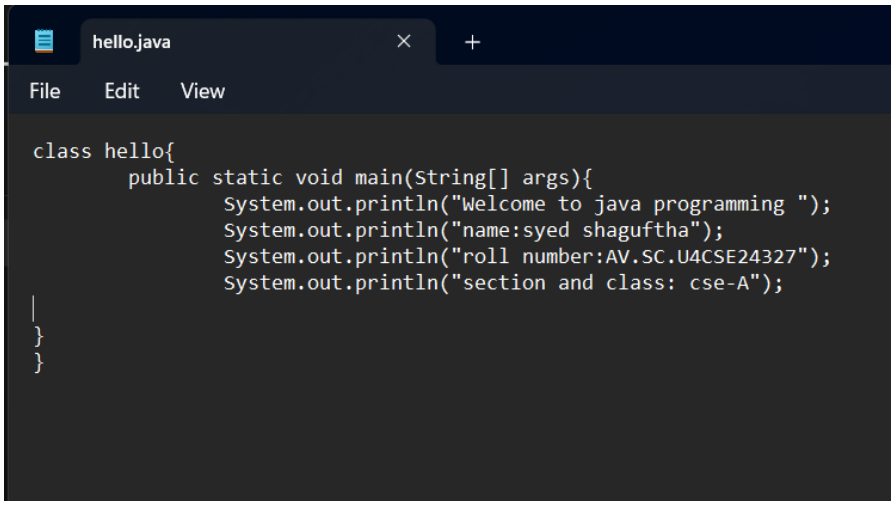
PROGRAME 3:

AIM : To write a java program to print the name,section and roll no .

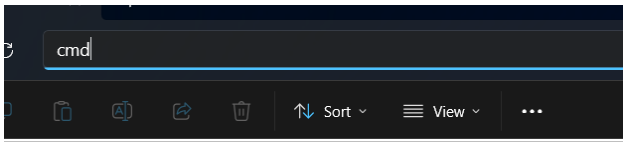
Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<hello.java

CODE:

```
class hello{
        public static void main(String [ ] args){
                System.out.println(“name : syed ”);
                System.out.println(“roll number  : AV.SC.U4CSE244444 ”);
                System.out.println(“class and section: CSE -A ”);
        }
}
```

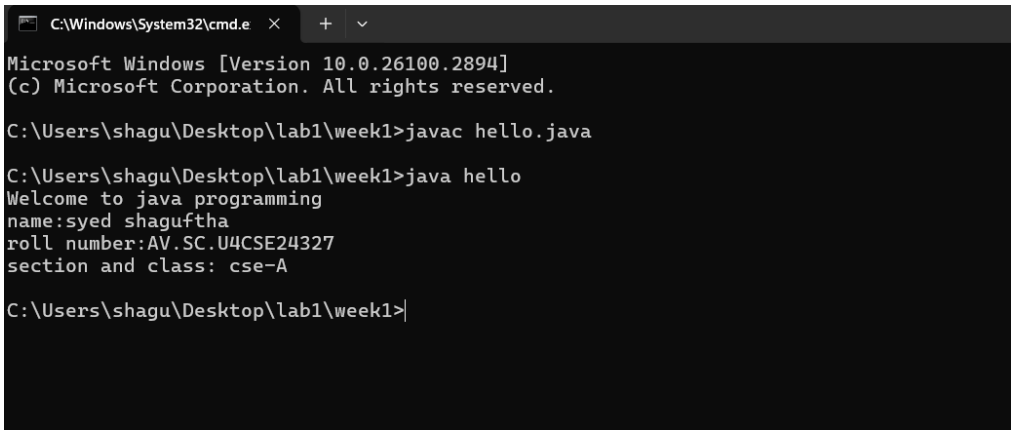


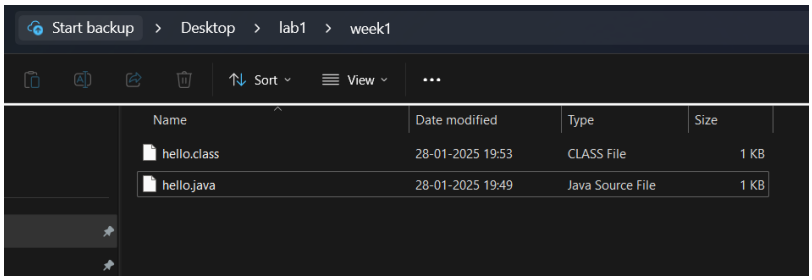
Step 2: to the path clear it and type cmd for running the program.



Step 3:follow commands as: javac hello.java<<enter<<jav hello

The program runs successfully.And creates a java clsss as shown below .





WEEK-2:

PROGRAM 1:

AIM: To write java program to calculate the area of rectangle .

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<exam.java

CODE:

```
import java.util.Scanner;

class exam{

        public static void main(String[] args){

                Scanner input= new Scannner(System.in);

                System.out.print("enter the length-l:");

                float  l=input.nextFloat();

                System.out.print("enter the length-l:");
```

```
        float  l=input.nextFloat();
        System.out.print("enter the breadth-b");
        float  l=input.nextFloat();
         float area=l*b;
        System.out.print("area is :"+area);
    }
}
```

Step 2:open code in commond prompt and run it.

```
import java.util.Scanner;
class exam{
public static void main(String[] args){
Scanner input= new Scanner(System.in);
System.out.print("enter the length-l:");
float l=input.nextFloat();
System.out.print("enter the breadth-b:");
float b=input.nextFloat();
float area=l*b;
System.out.print("area is :"+area);
        }
}
```

Step 3:enter the commands as javac exam.java <<java exam.the program is excuted successfully.

```
C:\Users\shagu\Desktop\lab1\week1>javac exam.java

C:\Users\shagu\Desktop\lab1\week1>java exam
enter the length-l:12.0
enter the breadth-b:6.5
area is :78.0
C:\Users\shagu\Desktop\lab1\week1>
```

Step 4:after runner the program system automatically creates a class for it .

ERRORS:

S.NO	ERROR MEASSAGE	ERROR RECTIFICATION
1.	Error:";"expected	Inserted ";"in line7
2.	Error:"?"unkown sysmbol	Replaced"?"with ":"

IMPORTANT POINTS:

1. used Scanner library to get input from user in run time .

2. "import java.util.Scanner;"-step to import library.

3. “Scanner input=new Scanner(System.in);”-step to use the scanner .

PROGRAM-2:

A. **AIM: To write java program to convert temperature from celcius to farenheit and vice via.**

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<exam.java

CODE:

```
//code for celciius to farenheit

import java.util.Scanner;

class exam{

	public static void main(String[ ] args){

		Scanner input=new Scanner(System.in);

		System.out.print(“Enter the celcius :”);

		float c:input.nextFloat();

		float f=(c*9/5)+32;

		System.out.print(“Farenheit heat :”+f);

	}

}
```

Step 2:open in commond prompt and run it.

```
import java.util.Scanner;
class exam{
public static void main(String[] args){
Scanner input= new Scanner(System.in);
System.out.print("Enter the celcius :");
float c=input.nextFloat();
float f=(c*9/5)+32;
System.out.print("Farenheit heat :"+f);
}
}
```

Step 3: enter the commands as javac exam <<java exam the program is excuted successfully.

```
C:\Users\shagu\Desktop\lab1\week1>javac exam.java

C:\Users\shagu\Desktop\lab1\week1>java exam
Enter the celcius :23.6
Farenheit heat :74.48
C:\Users\shagu\Desktop\lab1\week1>
```

Step 4:After runner the program system automatically creates a class of it.

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error :":" unknow symbol	Replace":" with"="
2.	Error: "scanner"small letter case censitive	"Scanner"

IMPORTANT POINTS:

1.used Scanner library to get input from user in run time.

2."import java.util.Scanner;"-step to import library.

3."Scanner input= new Scanner(System.in);"-step to use the scanner.

B. AIM: AIM: To write java program to convert temperature from farenheit to celceius.

CODE:

```
//code for farenheit  to celciius
import java.util.Scanner;
class exam{
        public static void main(String[ ] args){
                Scanner input=new Scanner(System.in);
                System.out.print("Enter the farenheit :");
                float f:input.nextFloat();
                float c=(f-32)*5/9;
                System.out.print("celcius temparature :"+c);
        }
}
```

Step 2:open in commond prompt and run it.

```
import java.util.Scanner;
class exam{
public static void main(String[] args){
Scanner input= new Scanner(System.in);
System.out.print("Enter the farenheit:");
float f=input.nextFloat();
float c=(f-32)*5/9;
System.out.print("Celues temparature:"+c);
}
}
```

Step 3: enter the commands as javac exam <<java exam the program is excuted successfully.

```
C:\Users\shagu\Desktop\lab1\week1>javac exam.java

C:\Users\shagu\Desktop\lab1\week1>java exam
Enter the farenheit:234
Celues temparature:112.22222
C:\Users\shagu\Desktop\lab1\week1>java exam
Enter the farenheit:12
Celues temparature:-11.111111
C:\Users\shagu\Desktop\lab1\week1>
```

Step 4:After runner the program system automatically creates a class of it.

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error :"oout" unknow keywoard	Replace"oout" with"out"
2.	Error: "scanner"small letter case censitive	"Scanner"

IMPORTANT POINTS:

1.used Scanner library to get input from user in run time.

2."import java.util.Scanner;"-step to import library.

3."Scanner input= new Scanner(System.in);"-step to use the scanner.

C. AIM: To write java program to calculate the simple

CODE:

```
Import  java.util.Scanner;

class  exam{
```

```
        public  static void main(String[ ] args){
                Scanner input=new Scanner(System.in);
                System.out.print(“enter the principle value(p):”);
                float  p=input.nextFloat();
                System.out.print(“enter the rate of interest value(r):”);
                float  r=input.nextFloat();
                System.out.print(“enter the time period value(t):”);
                float  t=input.nextFloat();
                float  si=(p*t*r)/100;
                System.out.println(“simple interest is:”+si);
        }
}
```

```
import java.util.Scanner;
class exam{
public static void main(String[] args){
Scanner input= new Scanner(System.in);
System.out.print("Enter the principle value(p):");
float p=input.nextFloat();
System.out.print("Enter the time period (T):");
float t=input.nextFloat();
System.out.print("Enter the rate of interest (r):");
float r=input.nextFloat();
float si=(p*t*r)/100;
System.out.print("simple interest is :"+si);
}
}
```

```
C:\Users\shagu\Desktop\lab1\week1>javac exam.java

C:\Users\shagu\Desktop\lab1\week1>java exam
Enter the principle value(p):120000
Enter the time period (T):2
Enter the rate of interest (r):1.2
simple interest is :2880.0
C:\Users\shagu\Desktop\lab1\week1>
```

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error :”T” is not declred	Replace:”T” with”t”

2.	Error : expected';' in line 8	Insert ';' in line 8 end

IMPORTANT POINTS:

1.java is a case sensitive language so "apple" is different from "APPLE",so clear declaration of variables is important..

D. AIM: To write a program to find the largest of three numbers using ternary operators.

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<exam.java

CODE:

```
import java.util.Scanner;

class exam{

	public static void main(String [ ] args){

		Scanner input=new Scanner(System.in);

		System.out.print("enter n1:");

		int n1=input.nextInt();

		System.out.print("enter n2:");

		int n2=input.nextInt();

		System.out.print("enter n3:");

		int n3=input.nextInt();

		int largest=(n1>=n2)?((n1>=n3)?n1:n3):((n2>=n3)?n2:n3);

		System.out.println("the lsrgest number is :"+lsrgest);

	}
```

```
import java.util.Scanner;
class exam{
        public static void main(String [ ] args){
                Scanner input=new Scanner(System.in);
                System.out.print("enter n1:");
                int n1=input.nextInt();
System.out.print("enter n2:");
                int n2=input.nextInt();
System.out.print("enter n3:");
                int n3=input.nextInt();
                int largest=(n1>=n2)?((n1>=n3)?n1:n3):((n2>=n3)?n2:n3);
                System.out.println("the largest number is :"+largest);
        }
}
```

```
C:\Users\shagu\Desktop\lab1\week1>java exam
enter n1:4
enter n2:5
enter n3:3
the largest number is :5

C:\Users\shagu\Desktop\lab1\week1>
C:\Users\shagu\Desktop\lab1\week1>java exam
enter n1:4
enter n2:4
enter n3:4
the largest number is :4
```

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error :";" expected in line 6	Insert";" in end of line 6
2.	Error :"nextint();" non identified	Replace"next.Int();"

IMPORTANT POINTS:

1. **Ternary operators: a shorthand for the if-else statement, used to execute condition-based operations in a single line.**
2. **It evaluates a Boolean condition and returns trueValue if the condition is true, otherwise it returns falseValue.**

E. AIM: To write a program for the factorial of the numbers.

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<exam.java

CODE:

```
import java.util.Scanner;

class exam{

        public static void main(String[] args){

                Scanner input=new Scanner(System.in);

                System.out.println("fibinocci series");
```

```
        System.out.println("enter a number:");
        int n =input.nextInt();
        int f1=0,f2=1;<br>
        System.out.println(" "+f1);
        System.out.println(" "+f2);
        for ( int i=1;i<=n;i++){
            int f3=f1+f2;
            System.out.println(" "+f3);
            f1=f2;
            f2=f3;
        }
    }
}
```

```
import java.util.Scanner;
class exam{
public static void main(String[] args){
Scanner input=new Scanner(System.in);
System.out.println("fibinocci series");
System.out.println("enter a number:");
int n =input.nextInt();
int f1=0,f2=1;
System.out.println(" "+f1);
System.out.println(" "+f2);
for ( int i=1;i<=n;i++){
int f3=f1+f2;
System.out.println(" "+f3);
f1=f2;
f2=f3;
}
}
}
```

```
C:\Users\shagu\Desktop\lab1\week1>javac exam.java

C:\Users\shagu\Desktop\lab1\week1>java exam
fibinocci series
enter a number:
5
 0
 1
 1
 2
 3
 5
 8

C:\Users\shagu\Desktop\lab1\week1>java exam
fibinocci series
enter a number:
-2
 0
 1
```

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error: line-9 illegal start of expression	Rebuilt of the line -9
2.	Error :iteration error	Correct iteration inserted

IMPORTANT POINTS:

1.Java for loop is a control flow statement that allows code to be executed repeatedly based on a given condition.

2.The for loop in java provides an efficient way to iterate over a range of values ,execute code multiple times,or traverse arrays and collections.

WEEK-3

PROGRAME-1

AIM: To write a program for car color and all respective complextions using constructor and method.

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<car.java

CODE:

```
Class car{
```

```
        //creating the attributes requires for the classs
        String car_name,car_color,car_brand,fule_type;
        int maleage;
        //constructor
        car(String car_name,String car_color,String car_brand,String
fule_type,int maleage){
        this.car_name=car_name;
        this.car_color=car_color;
        this.car_brand=car_brand;
        this.fule_type=fule_type;
        this.maleage=maleage;
        }
        //creating the methods forte class
        public void start(){
        System.out.println("this is start statement: "+car_name+"  "+car_color);
        }
        public void stop(){
        System.out.println("this is start statement: "+car_brand+"  "+fule_type);
        }
        public void services(){
        System.out.println("this is start statement: "+maleage);
        }
        public static void main(String[] args){
        //creating the object for the class
        car car1=new car("maruthi","navy blue","KIA","petrol", 1234);
        car1.start();
        car car2=new car("maruthi","navy blue","KIA","petrol", 1234);
        car2.stop();
```

car car3=new car("maruthi","navy blue","KIA","petrol", 1234);

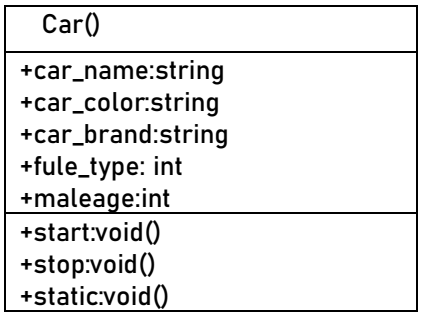
car3.services();

System.out.println("\n THANK YOU FOR APPLYING THIS");

}

}

CLASS DIAGRAM:




```
class car{
//creating the attributes requires for the classs
String car_name,car_color,car_brand,fule_type;
int maleage;
//constructor
car(String car_name,String car_color,String car_brand,String fule_type,int maleage){
this.car_name=car_name;
this.car_color=car_color;
this.car_brand=car_brand;
this.fule_type=fule_type;
this.maleage=maleage;
}

//creating the methods forte class

public void start(){
System.out.println("this is start statement: "+car_name+"  "+car_color);
}

public void stop(){
System.out.println("this is start statement: "+car_brand+"  "+fule_type);
}

public void services(){
System.out.println("this is start statement: "+maleage);
}

public static void main(String[] args){
//creating the object for the class
car car1=new car("maruthi","navy blue","KIA","petrol", 1234);
car1.start();
car car2=new car("maruthi","navy blue","KIA","petrol", 1234);
car2.stop();
car car3=new car("maruthi","navy blue","KIA","petrol", 1234);
car3.services();

System.out.println("\n THANK YOU FOR APPLYING THIS");
}
}
```

```
C:\Users\shagu\Desktop\lab1\week1>javac car.java

C:\Users\shagu\Desktop\lab1\week1>java car.java
this is start statement: maruthi  navy blue
this is start statement: KIA  petrol
this is start statement: 1234

 THANK YOU FOR APPLYING THIS

C:\Users\shagu\Desktop\lab1\week1>
```

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error: line7 expected ‘;	Inserted ‘;’
2.	Error :line 7 unknow’__’	Removed ‘_’
3.	Error : correct data type declararion in constructor	Rectified by declaring the data type as String and int.

IMPORTANT POINTS:

1. **Java constructor is used to save the variables present in different or same class or methods.**
2. **In Java, the this keyword refers to the current instance of a class. It is commonly used to distinguish between instance variables and parameters with the same name, or to refer to the current object from within a method or constructor.**

3. In Java, a method is a block of code that performs a specific task and can be invoked to execute that task. It typically consists of a method signature (name, return type, and parameters) and the body of the method, which contains the logic.

AIM: To write a program for car color and all respective complextions using constructor and method.

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<BANK.java

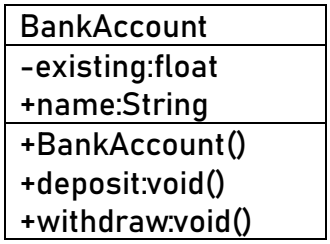
CODE:

```
import java.util.Scanner;

class BankAccount {

 // Class-level variable to store balance

    private float existing;

    private Scanner input; // Single Scanner instance for input

    public  String name;
```

```
// Constructor
public BankAccount() {
    input = new Scanner(System.in);
    System.out.println("Enter the account holder name :");
    this.name=input.next();

    System.out.print("Enter existing amount in bank account: ");
    this.existing = input.nextFloat();
}
// Deposit method
public void deposit() {
    System.out.print("Enter amount to be deposited: ");
    float deposit = input.nextFloat();
    existing += deposit;
    System.out.println("Existing amount now is: " + existing);
}
// Withdrawal method
public void withdrawal() {
    System.out.print("Enter amount to be withdrawn: ");
    float withdrawal = input.nextFloat();
    if (existing < withdrawal) {
        System.out.println("Not sufficient balance.");
    } else {
        existing -= withdrawal;
        System.out.println("Remaining balance: " + existing);
    }
}
// Main method
```

```
        public static void main(String[] args) {
            BankAccount customer1 = new BankAccount();
            customer1.deposit();
            customer1.withdrawal();
            System.out.println("thank you " + customer1.name + " for using
our bank");
        }
        }
```

CLASS DIAGRAM:



```java
import java.util.Scanner;

class BankAccount {
 // Class-level variable to store balance
    private float existing;
    private Scanner input; // Single Scanner instance for input
    public  String name;
    // Constructor
    public BankAccount() {
        input = new Scanner(System.in);
        System.out.println("Enter the account holder name :");
        this.name=input.next();

        System.out.print("Enter existing amount in bank account: ");
        this.existing = input.nextFloat();
    }
    // Deposit method
    public void deposit() {
        System.out.print("Enter amount to be deposited: ");
        float deposit = input.nextFloat();
        existing += deposit;
        System.out.println("Existing amount now is: " + existing);
    }
    // Withdrawal method
    public void withdrawal() {
        System.out.print("Enter amount to be withdrawn: ");
        float withdrawal = input.nextFloat();
        if (existing < withdrawal) {
            System.out.println("Not sufficient balance.");
        } else {
            existing -= withdrawal;
            System.out.println("Remaining balance: " + existing);
        }
    }
    // Main method
    public static void main(String[] args) {
        BankAccount customer1 = new BankAccount();
        customer1.deposit();
        customer1.withdrawal();
        System.out.println("thank you " + customer1.name + " for using our bank");

}
}
```

```
C:\Users\shagu\Desktop\lab1\week1>javac BANK.java

C:\Users\shagu\Desktop\lab1\week1>java BANK.java
Enter the account holder name :
wertyuy
Enter existing amount in bank account: 234567
Enter amount to be deposited: 34567
Existing amount now is: 269134.0
Enter amount to be withdrawn: 456
Remaining balance: 268678.0
thank you wertyuy for using our bank

C:\Users\shagu\Desktop\lab1\week1>
```

```
C:\Users\shagu\Desktop\lab1\week1>java BANK.java
Enter the account holder name :
qwerty
Enter existing amount in bank account: 0000
Enter amount to be deposited: 000
Existing amount now is: 0.0
Enter amount to be withdrawn: 2345
Not sufficient balance.
thank you qwerty for using our bank

C:\Users\shagu\Desktop\lab1\week1>
```

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
4.	Error: nextString(); wrong identifier	Rectification: next();
5.	Error :line 7 unknow'__'	Removed '_'
6.	Error : if statement '{}' expected	Inserted '{}'

IMPORTANT POINTS:

2. Java constructor is used to save the variables present in different or same class or methods.
2. In Java, the this keyword refers to the current instance of a class. It is commonly used to distinguish between instance variables and parameters with the same name, or to refer to the current object from within a method or constructor.

3. In Java, a method is a block of code that performs a specific task and can be invoked to execute that task. It typically consists of a method signature (name, return type, and parameters) and the body of the method, which contains the logic.

WEEK-4

PROGRAME-1

AIM: To write a program for printing the title of the book and the author and year of publication using the constructors

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<person.java

CODE:

```
class book{
//creating the variable
public String title_of_book;
public String author;
public int year_publication;
//creating a constructor
book(String title_of_book,String author,int year_publication){
this.title_of_book=title_of_book;
this.author=author;
this.year_publication=year_publication;
}
//creating the method to print DETAILS
public void details(){
System.out.println("the title of the book is: "+title_of_book+"\nThe
author of te book is: "+author+"\nthe year of publication
is:"+year_publication+"\n");
}
//creating the main class and objects for the method
public static void main(String[] args){
book one=new book("THE GREAT INDIAN
RIVERS","DR.SHIVARAM",1989);
one.details();
book two=new book("ANGLES IN TIBET","S.SLUMP",2001);
```

two.details();

System.out.println("\nThese are the details of the two books which are famously treading nowadays\n THANK YOU ");

}

}

CLASS DIAGRAM:

Book
+title_of_book:string +author:string +year_publication:int
+book() +detailes:void()

```
class book{
//creating the variables

public String title_of_book;
public String author;
public int year_publication;

//creating a constructor
book(String title_of_book,String author,int year_publication){
this.title_of_book=title_of_book;
this.author=author;
this.year_publication=year_publication;
}
//creating the method to print DETAILS
public void details(){
System.out.println("the title of the book is: "+title_of_book+"\nThe author of te book is: "+author+"\nthe year of publication is:"+year_publication+"\n");
}
//creating the main class and objects for the method
public static void main(String[] args){
book one=new book("THE GREAT INDIAN RIVERS","DR.SHIVARAM",1989);
one.details();
book two=new book("ANGLES IN TIBET","S.SLUMP",2001);
two.details();
System.out.println("\nThese are the details of the two books which are famously treading nowadays\n THANK YOU ");
}

}
```

```
C:\Users\shagu\Desktop\lab1\week1>java person.java
the title of the book is: THE GREAT INDIAN RIVERS
The author of te book is: DR.SHIVARAM
the year of publication is:1989

the title of the book is: ANGLES IN TIBET
The author of te book is: S.SLUMP
the year of publication is:2001


These are the details of the two books which are famously treading nowadays
 THANK YOU
```

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error: “ this.year_public;=year_public;”	Rectification: removed the ‘;’
2.	Error :”missing ‘;’- “System.out.println(“..”);	Inserted the ‘;’ in the line.

IMPORTANT POINTS:

1. **Java constructor is used to save the variables present in different or same class or methods.**
2. **In Java, the this keyword refers to the current instance of a class. It is commonly used to distinguish between instance variables and parameters with the same name, or to refer to the current object from within a method or constructor.**

PROGRAME-2

AIM: To write a program for printing the title of the book and the author and year of publication using the constructors

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<exam.java

CODE:

```
class myclass{
//creating the variables
static int count=0;
final double pi=3.1415;
//creating a constructor
myclass(){
count++;// creatinfg the condition for the increment of the static count variable
}
//method to print the values
public void values(){
System.out.println(+count);
System.out.println(+pi);
}
```

//object and the main function

public static void main(String[] args){

//creating the four objects to check the code for the condition of constructor

myclass one=new myclass();

one.values();

myclass two=new myclass();

two.values();

myclass three=new myclass();

three.values();

myclass four=new myclass();

four.values();

}

} CLASS DUAGRAM:

Myclass
-count:0 -pi:3.1415
+myclass() +values:void()

```
class myclass{
//creating the variable
static int count=0;
final double pi=3.1415;
//creating a constructor
myclass(){
count++;//creating the condn for the increament of the count variable
}
//method to print the values
public void values(){
System.out.println(+count);
System.out.println(+pi);
}
//object and the main function
public static void main(String[] args){
//creating the objects too verify the condn of the constructor |
myclass one=new myclass();
one.values();
myclass two=new myclass();
two.values();
myclass three=new myclass();
three.values();
myclass four=new myclass();
four.values();
}
}
```

```
C:\Users\shagu\Desktop\lab1\week1>java person.java
1
3.1415
2
3.1415
3
3.1415
4
3.1415
```

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error: argument required of type int	Rectification: rectified the argument issue.
2.	Error :line 7 unknow'__'	Removed '_'
3.	Error : if statement ';' expected	Inserted:count++;

IMPORTANT POINTS:

1. Java constructor is used to save the variables present in different or same class or methods.
2. In Java, the ++ operator increments a variable by 1, either as **pre-increment** (++x) or **post-increment** (x++).
3. In Java:
   1. **static**: A static variable belongs to the class, not instances, meaning all objects share the same value.
   2. **final**: A final variable cannot be modified once assigned, making it constant.

WEEK-5

PROGRAME-1

AIM: create a calculator using the operations including add,sub,multi and div using multilevel inheritanceand display the desipred output

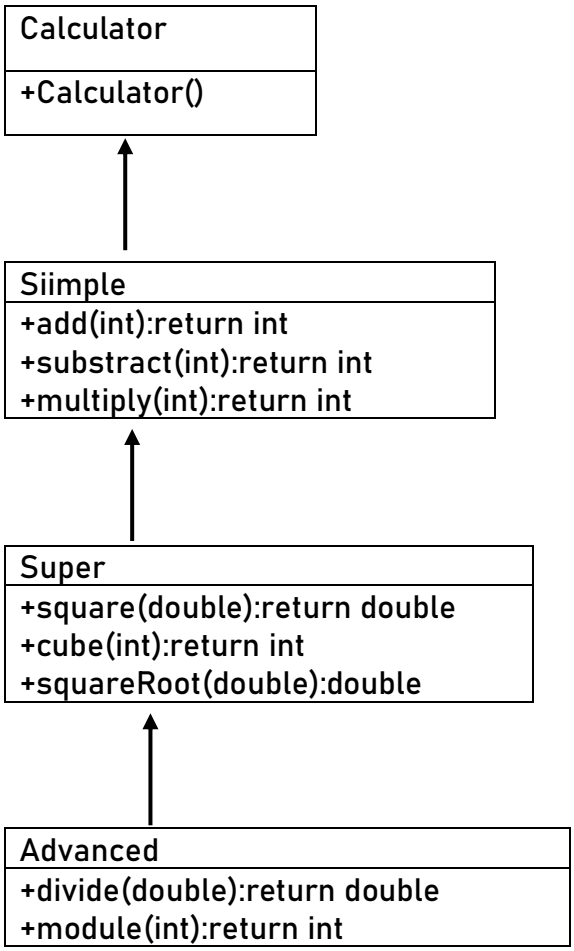
Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<inheritance.java

CODE:

```
import java.util.Scanner;

class Calculator {

   // Base class for the calculator

Calculator(){
```

```
System.out.println("\nthis is the calculator program\n");
System.out.println("-----------------------------------");
} }
class Simple extends Calculator {
    public int add(int a, int b) {
        return a + b;
    }
    public int subtract(int a, int b) {
        return a - b;
    }
    public int multiply(int a, int b) {
        return a * b;
    } }
class Super extends Simple {
    public int square(int a) {
        return a * a;
    }
    public int cube(int a) {
        return a * a * a;
    }
    public double squareRoot(int a) {
        return Math.sqrt(a);
    }
}
class Advanced extends Super {
    public double divide(int a, int b) {
        if (b != 0) {
            return (double) a / b;
```

```
        } else {
            return 0; // Division by zero is not allowed.
        }
    }
    public int modulus(int a, int b) {
        return a % b;
    }
}
public class inherit {
    public static void main(String[] args) {
        Scanner input=new Scanner(System.in);
        System.out.println("enter a value:");
        int a=input.nextInt();
        System.out.println("enter b value: ");
        int b=input.nextInt();
        Simple simpleCalc = new Simple();
        System.out.println("Addition: " + simpleCalc.add(a, b));
        System.out.println("Subtraction: " + simpleCalc.subtract(a, b));
        System.out.println("Multiplication: " + simpleCalc.multiply(a, b));
        Advanced advancedCalc = new Advanced();
        System.out.println("Division: " + advancedCalc.divide(a, b));
        System.out.println("Modulus: " + advancedCalc.modulus(a, b));
        Super superCalc = new Super();
        System.out.println("Square: " + superCalc.square(a));
        System.out.println("Cube: " + superCalc.cube(b))
        System.out.println("Square Root: " + superCalc.squareRoot(b));
    } }
```


Calculator
+Calculator()
Siimple
+add(int):return int
+substract(int):return int
+multiply(int):return int
Super
+square(double):return double
+cube(int):return int
+squareRoot(double):double
Advanced
+divide(double):return double
+module(int):return int

```
import java.util.Scanner;
class Calculator {
    // Base class for the calculator
Calculator(){
System.out.println("\nthis is the calculator program\n");
System.out.println("-------------------------------------");
}

}

class Simple extends Calculator {
    public int add(int a, int b) {
        return a + b;
    }

    public int subtract(int a, int b) {
        return a - b;
    }

    public int multiply(int a, int b) {
        return a * b;
    }
}

class Super extends Simple {
    public int square(int a) {
        return a * a;
    }

    public int cube(int a) {
        return a * a * a;
    }

    public double squareRoot(int a) {
        return Math.sqrt(a);
    }
}
class Advanced extends Super {

    public double divide(int a, int b) {
        if (b != 0) {
            return (double) a / b;
        } else {
            return 0; // Division by zero is not allowed.

        }
    }

    public int modulus(int a, int b) {
```

```
        }
    }

    public int modulus(int a, int b) {
        return a % b;
    }
}

public class inherit {
    public static void main(String[] args) {
        Scanner input=new Scanner(System.in);

        System.out.println("enter a value:");
        int a=input.nextInt();
        System.out.println("enter b value: ");
        int b=input.nextInt();
        Simple simpleCalc = new Simple();
        System.out.println("Addition: " + simpleCalc.add(a, b));

        System.out.println("Subtraction: " + simpleCalc.subtract(a, b));

        System.out.println("Multiplication: " + simpleCalc.multiply(a, b));


        Advanced advancedCalc = new Advanced();
        System.out.println("Division: " + advancedCalc.divide(a, b));

        System.out.println("Modulus: " + advancedCalc.modulus(a, b));


        Super superCalc = new Super();
        System.out.println("Square: " + superCalc.square(a));

        System.out.println("Cube: " + superCalc.cube(b));

        System.out.println("Square Root: " + superCalc.squareRoot(b));

    }
}
```

```
enter a value:
16
enter b value:
9

this is the calculator program

_____________________________________
Addition: 25
Subtraction: 7
Multiplication: 144

this is the calculator program

_____________________________________
Division: 1.7777777777777777
Modulus: 7

this is the calculator program

_____________________________________
Square: 256
Cube: 729
Square Root: 3.0
```

```
enter a value:
-9
enter b value:
-8

this is the calculator program

_____________________________________
Addition: -17
Subtraction: -1
Multiplication: 72

this is the calculator program

_____________________________________
Division: 1.125
Modulus: -1

this is the calculator program

_____________________________________
Square: 81
Cube: -512
Square Root: NaN
```

ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
1.	Error: mutipile inheritance in the Advanved class	Implemented Advanced class from Super class.
2.	Error : Scanner;	Scanner(System.in);

IMPORTANT POINTS:

1. **Multiple inheritance lets a class inherit from multiple parents, combining their features, but can cause issues like the diamond problem, resolved by MRO.**
2. **Math.sqrt() in Java calculates the square root of a non-negative double value and returns a double result, or NaN if the input is negative.**
3. **The import java.util.Scanner; statement in Java allows you to use the Scanner class from the java.util package, which is commonly used to read user input from the console.**

PROGRAME-2

AIM: **create a java program of a vehicle entry company hireachical wants to develop his system that maintains information about different types of cars and bikes and they need a program to store details about each vehicle auch as brand and speed**

Step 1:open notepad<<save the note pad in the path[desktop<<oops<<week 1<<inheritance.java

CODE:

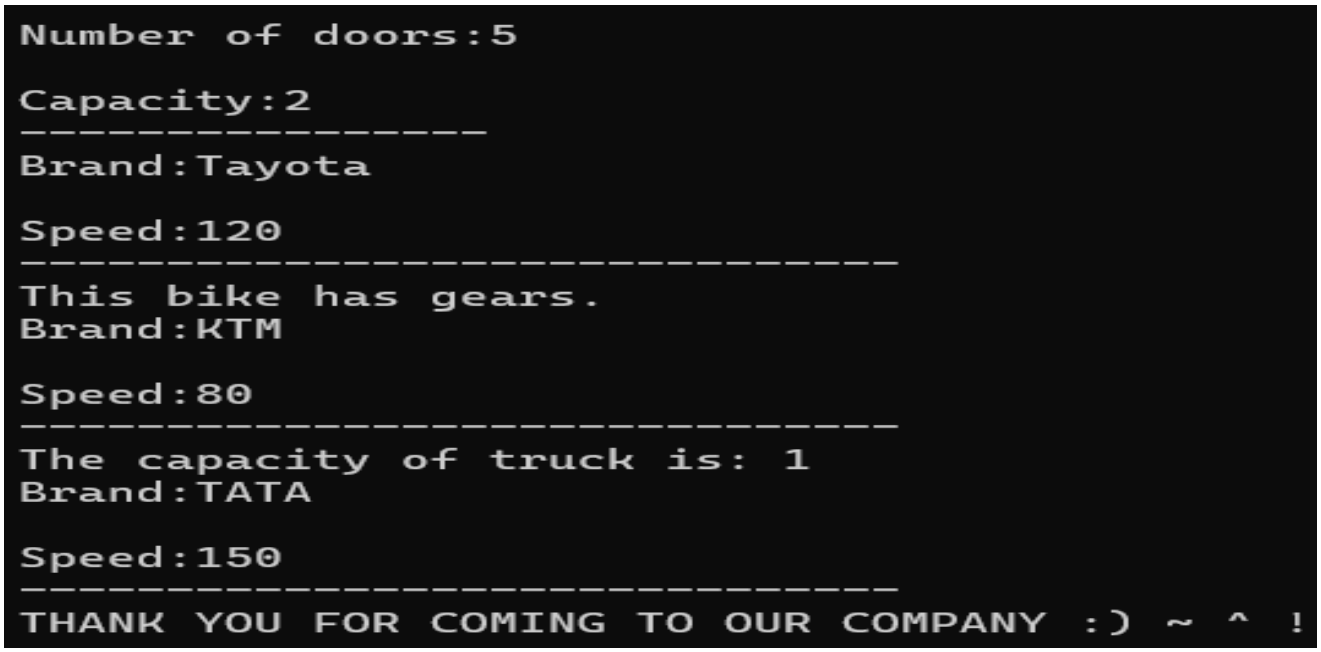
```
class Vehicle{
   String brand;
   int speed;
   Vehicle(String brand,int speed){
      this.brand=brand;
      this.speed=speed;
   }
   void Details(){
      System.out.println("Brand:"+brand);
      System.out.println("\nSpeed:"+speed);
            System.out.println("------------------------------");
   }
}//End of super class
class CARS extends Vehicle{
```

```
    int doors;
    int capacity;
    public CARS(String brand,int speed,int doors,int capacity){
        super(brand, speed);
        this.doors=doors;
        this.capacity=capacity;
    }
    void cardetails(){
        System.out.println("\nNumber of doors:"+doors);
        System.out.println("\nCapacity:"+capacity);
                System.out.println("----------------");
}
}//End of car sub-class
class Bikes extends Vehicle{
    Boolean gears;
    Bikes(String brand,int speed,Boolean gears){
        super(brand, speed);
        this.gears=gears;
    }
    void bikedetails(){
        if (gears==true) {
        System.out.println("This bike has gears.");
                }
        else{
        System.out.println("This bike does not have gear system.");
}
}
}//End of bike sub-class
class Trucks extends Vehicle{
    int tons;
    Trucks(String brand,int speed,int tons){
        super(brand, speed);
        this.tons=tons;
    }
    void truckdetails(){
        System.out.println("The capacity of truck is: "+tons);
```

```
    }
}//End of truck sub-class
class inherit{
    public static void main(String[] args){
        CARS c=new CARS("Tayota",120,5,2);
        c.cardetails();
        c.Details();
        Bikes b=new Bikes("KTM",80,true);
        b.bikedetails();
        b.Details();
        Trucks t=new Trucks("TATA",150,1);
        t.truckdetails();
        t.Details();
            System.out.println("THANK YOU FOR COMING TO OUR COMPANY :) ~ ^ !");
    }
}
```

```
class Vehicle{
     String brand;
     int speed;
     Vehicle(String brand,int speed){
          this.brand=brand;
          this.speed=speed;
     }
     void Details(){
          System.out.println("Brand:"+brand);
          System.out.println("\nSpeed:"+speed);
          System.out.println("-------------------------------");
     }
}//End of super class

class CARS extends Vehicle{
     int doors;
     int capacity;
     public CARS(String brand,int speed,int doors,int capacity){
          super(brand, speed);
          this.doors=doors;
          this.capacity=capacity;
     }
     void cardetails(){
          System.out.println("\nNumber of doors:"+doors);
          System.out.println("\nCapacity:"+capacity);
          System.out.println("-----------------");
}

}//End of car sub-class

class Bikes extends Vehicle{
     Boolean gears;
     Bikes(String brand,int speed,Boolean gears){
          super(brand, speed);
          this.gears=gears;
     }
     void bikedetails(){
          if (gears==true) {
          System.out.println("This bike has gears.");
          }
          else{
          System.out.println("This bike does not have gear system.");
}
}

}//End of bike sub-class

class Trucks extends Vehicle{
     int tons;
     Trucks(String brand,int speed,int tons){
          super(brand, speed);
          this.tons=tons;
     }
     void truckdetails(){
          System.out.println("The capacity of truck is: "+tons);
     }

}//End of truck sub-class
```

```
}//End of truck sub-class
class inherit{
    public static void main(String[] args){
        CARS c=new CARS("Tayota",120,5,2);
        c.cardetails();
        c.Details();
        Bikes b=new Bikes("KTM",80,true);
        b.bikedetails();
        b.Details();
        Trucks t=new Trucks("TATA",150,1);
        t.truckdetails();
        t.Details();
        System.out.println("THANK YOU FOR COMING TO OUR COMPANY :) ~ ^ !");
    }
}
```



ERRORS:

S.NO	ERROR MESSAGE	ERROR RECTIFICATION
4.	Error: Incorrect Constructor Arguments.	the arguments passed when creating an object match the constructor's parameter list in both **number** and **type**.
5.	Error : Scanner;	Scanner(System.in);

IMPORTANT POINTS:

1. **Hierarchical inheritance is a type of inheritance where multiple subclasses inherit from a single parent class, allowing code reuse and reducing redundancy.**
2. **A constructor is a special method in a class used to initialize new objects with default or provided values. It is automatically called when an object is created and sets up the object's initial state.**