23CSE111

OBJECT ORIENTED PROGRAMMING

LAB REPORT

Department of Computer Science Engineering

Amrita School of Computing

Amrita Vishwa Vidyapeetham, Amaravati Campus

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Verified By

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S.No.	Experiment Name	Page No.	Remarks	Signature
	WEEK-1			
1	Installation Process of JDK			
2	Simple Java Program for printing basic details of student			
	WEEK-2			
1	Write a Java Program to find the factorial of a number			
2	Write a Java Program to find the Fibonacci Series of given length			
3	Write a Java Program to find the temperature from Celsius to Fahrenheit			
4	Write a Java Program to find the Simple Interest			
5	Write a Java Program to find the area of triangle using heron's formula			
6	Write a Java Program to find the area of rectangle			
	WEEK-3			
1	Write a java program with the following instructions: a. Create class with name car. b. Create 4 attributes named car color, car brand, fuel type, mileage. c. Create 3 methods named start(), stop(), service().			

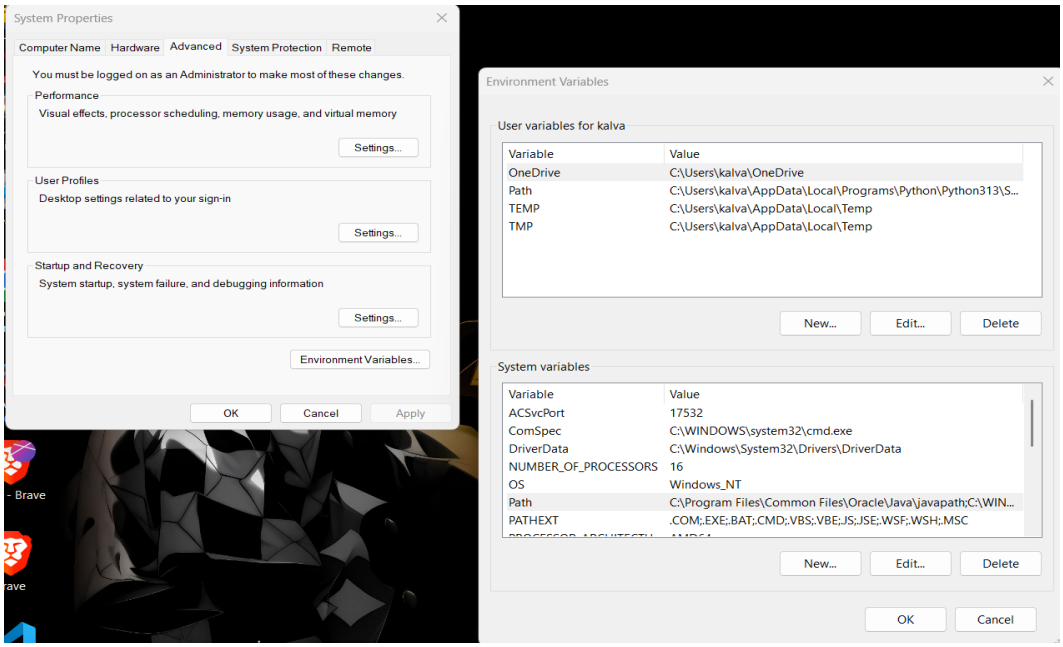
	d. Create 3 objects C1, C2, C3. e. Create a constructor with parameters with car color, car brand, fuel type, mileage.			
2	Create a class named bank account with methods deposit and withdraw. Where the deposit method should accepts a parameter and when this method is called the deposited amount should be added to current balance. In addition to that when a withdraw method is called it has to verify whether the withdraw amount is less than the current balance. If not display message saying that there are insufficient funds. Use the constructor to display the details of the customer (Name, Account number, IFSC code, Branch). Also create two customer objects C1, C2.			

WEEK-1

1) Explain the process of Installing JDK (Java Development Kit)

Installing of JDK (Java Development Kit):

1. **Download JDK:**
   - Go to the Oracle JDK download page in your google and click on JDK-21 version which is Long term support (LTS) version.
   - Click on the download link as per your operating system (Windows, macOS, or Linux).
2. **Install JDK:**
   - Once downloaded, run the installer.
   - Follow the instructions and keep clicking "Next" until it's done.
3. **Set Environment Variables (Windows):**
   - Open file explorer, then right click on This PC next select on properties then it will take you to the settings app then click on advanced system settings and then click on **Environment Variables**.
   - Click on path and new under **System Variables**:
     - **Variable value:** The folder address where JDK is installed (like C:\Program Files\Java\jdk-21\bin)
   - Find Path under **System Variables**, click **New**, and add the path of the jdk-21(C:\Program Files\Java\jdk-21\bin)



Checking of JDK Version:

1. **Open Command Prompt:**
   - Press win+R, type cmd, and press Enter.
2. **Check Version:**
   - Type java -version and press Enter.
   - Type javac --version and press Enter.

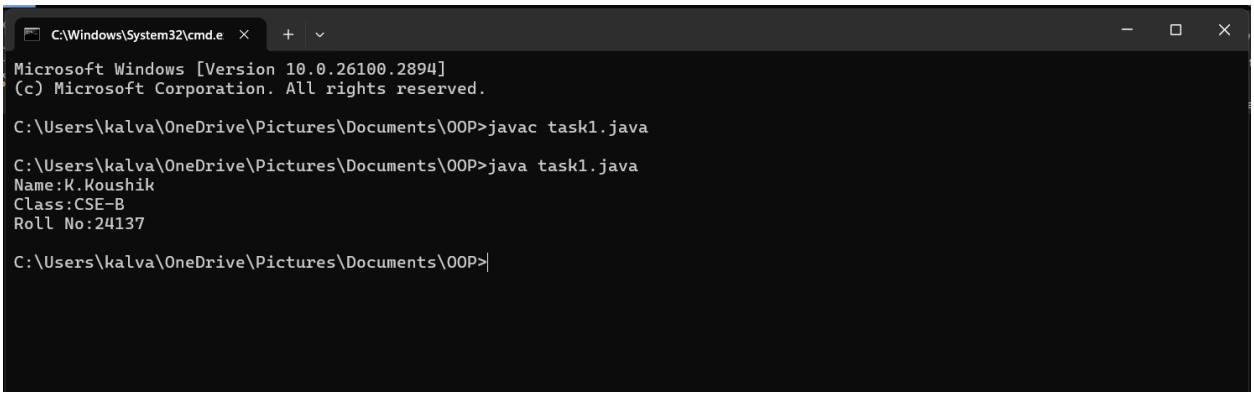
2) Simple Java Program for printing Name, Class, Roll No, of a Student

Write your code in Notepad and execute it in cmd prompt

CODE:

```
class Main
{
	public static void main(String[] args)
	{
		System.out.println("Name:K.Koushik");
		System.out.println("Class:CSE-B");
		System.out.println("Roll No:24137");
	}
}
```

Output:



Errors:

S.NO	Error Name	Error Rectification
1	Syntax/ Compilation Error	Absence of Semicolon
2	Closing Brackets	Need to Close the brackets

WEEK-2

Task-1:Write a java program to calculate the simple interest for user wanted details?

Sol

Program –

```
import java.util.Scanner;

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

 System.out.print("Enter the amount - ");
double num=input.nextDouble();
 System.out.println("Amount = " + num);

System.out.print("Enter the rate of interest in % - ");
double num1=input.nextDouble();
 System.out.println("Rate of interest = " + num1);

System.out.print("Enter the Time in years - ");
double num2=input.nextDouble();
 System.out.println("Time = " + num2);

double output=(num*num1*num2)/100;
System.out.println("The simple interest is "+output);

input.close();
}
}
```

Output:

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac SI.java

C:\Users\kalva\OneDrive\Desktop\OOP>java SI.java
Enter the amount - 100000
Amount = 100000.0
Enter the rate of interest in % - 15
Rate of interest = 15.0
Enter the Time in years - 3
Time = 3.0
The simple interest is 45000.0
```

Error Table -

s.no	Error	Rectification
1	Error : cannot find symbol	Here in nextdouble() D should be capital Or else it is not considered as data type

Task-2(a):Write a java program to calculate the Area of rectangle for user wanted details?

Sol

Program -

```
import java.util.Scanner;

class arear{
    public static void main(String[] args){
        Scanner input=new Scanner(System.in);
        System.out.println("enter the length :");
        int a=input.nextInt();
        System.out.println("enter the breadth:");
        int b=input.nextInt();

        double area=a*b;
        System.out.println("Area of rectangle :"+area);
        input.close();  }
}
```

Output –

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac arearect.java

C:\Users\kalva\OneDrive\Desktop\OOP>java arearect.java
enter the length :
50
enter the breadth:
20
Area of rectangle :1000.0
```

Error Table -

s.no	Error	Rectification
1	We can get symbol not found error means the system can't find given symbols.	Here in nextInt() I should be capital Or else it is not considered as data type
2	Here we use a,b values as int so we should int values.	Here we should give input values as int domain values.

Task-2(b):Write a java program to calculate the Area of triangle for user wanted details?

Sol

Program -

```
import java.util.Scanner;

class areat{
    public static void main(String[] args){
        Scanner input=new Scanner(System.in);
        System.out.println("enter the side a :");
        int a=input.nextInt();
        System.out.println("enter the side b :");
        int b=input.nextInt();
        System.out.println("enter the side c :");
        int c=input.nextInt();
        double s=(a+b+c)/2;
        double area=(Math.sqrt(s*(s-a)*(s-b)*(s-c)));
        System.out.println("Area of triangle :"+area);
        input.close();  }
}
```

output –

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac areatri.java

C:\Users\kalva\OneDrive\Desktop\OOP>java areatri.java
enter the side a :
3
enter the side b :
3
enter the side c :
3
Area of triangle :2.0
```

Error Table -

s.no	Error	Rectification
1	Here at output we may end up getting Error at end product.	We should use float or double datatypes.
2	Here we can get wrong value at the end	We should make sure that we should give correct indentation Math.sqrt (s*(s-a)*(s-b)*(s-c)).

Task-3:Write a java program to calculate the factorial for user wanted numbers?

Sol

Program -

```
import java.util.Scanner;
class facto{
    public static void main(String[] args){
        Scanner input=new Scanner(System.in);
        System.out.println("enter the number :");
        int num=input.nextInt();
        long f=1;
        for(int i=1;i<=num;i++){
            f*=i;
        }
        System.out.println("the factorial of "+num+" is "
        +f);
input.close();   }
}
```

output –

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac facto.java

C:\Users\kalva\OneDrive\Desktop\OOP>java facto.java
enter the number :
6
the factorial of 6 is 720
```

Error Table -

s.no	Error	Rectification
1	Here at output we may end up getting Error at end product.	We should prefer using the Long datatype for could flexibility
2	Error in recursion may possible	We should make sure that The recursion steps be prefect.

Task-4:Write a java program to calculate the Fibonacci series for user wanted numbers?

Sol

Program -

```
import java.util.Scanner;
class fib{
    public static void main(String[] arg){
        Scanner input=new Scanner(System.in);
        System.out.println("enter the number :");
        int num=input.nextInt();
        int n1=1;
        int n2=2;
        System.out.println("the intial n1 =" +n1);
        System.out.println("the intial n2 =" +n2);
        for(int i=1;i<=num;i++){
            int num1=n1+n2;
            n1=n2;
            n2=num1;
           System.out.println("the n1 =" +n1);
           System.out.println("the n2 =" +n2);
        }
input.close();

    }
}
```

output –

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac fib.java

C:\Users\kalva\OneDrive\Desktop\OOP>java fib.java
enter the number :
3
the intial n1 =1
the intial n2 =2
the n1 =2
the n2 =3
the n1 =3
the n2 =5
the n1 =5
the n2 =8
```

Error Table -

s.no	Error	Rectification
1	We might end up getting wrong output at the end.	Make sure variables are correctly assigned
2	Error in recursion steps	We should make sure that The recursion steps be prefect.

Task-5(a):Write a java program to calculate the temperature of Celsius to Fahrenheit for user wanted numbers?

Sol

Program – Celsius to Fahrenheit-

```
import java.util.Scanner;

class tempf{
    public static void main(String[] args){
        Scanner input=new Scanner(System.in);
        System.out.println("enter the temperature in celsius :");
        double c=input.nextInt();
        double f=((9*c/5)+32);
        System.out.println("the temperature in fahrenheit:"+f);
        input.close();  }
}
```

output –

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac tempf.java

C:\Users\kalva\OneDrive\Desktop\OOP>java tempf.java
enter the temperature in celsius :
37
the temperature in fahrenheit:98.6
```

Error Table -

s.no	Error	Rectification
1	Error in datatypes .	Make sure variables are double or float datatypes.
2	We might end up with wrong values at the output	We should make sure that Brackets and multiplication Symbols at correct order.

Task-5(b):Write a java program to calculate the temperature of Fahrenheit to Celsius for user wanted numbers?

Sol

Program – (1) Fahrenheit to Celsius -

```
import java.util.Scanner;

class tempc{
    public static void main(String[] args){
        Scanner input=new Scanner(System.in);
        System.out.println("enter the temperature in fahrenheit:");
        double f=input.nextInt();
        double c=(((f-32)*5)/9);
        System.out.println("the temperature in celsius:"+c);
        input.close();  }
}
```

output –

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac tempc.java

C:\Users\kalva\OneDrive\Desktop\OOP>java tempc.java
enter the temperature in fahrenheit:
98
the temperature in celsius:36.666666666666664
```

Error Table -

s.no	Error	Rectification
1	Error in datatypes .	Make sure variables are double or float datatypes.
2	We might end up with wrong values at the output	We should make sure that Brackets and multiplication Symbols at correct order.

Week-3

Task-1:

Write a java program with the following instructions:

a. Create class with name car.

b. Create 4 attributes named car color, car brand, fuel type, mileage.

c. Create 3 methods named start(), stop(), service().

d. Create 3 objects C1, C2, C3.

e. Create a constructor with parameters with car color, car brand, fuel type, mileage.

Program:

```
class Car{
String color;
String brand;
String fuel_type;
double milage;

//constructor
 public Car(String color,String brand,String fuel_type,double milage){
this.brand=brand;
this.color=color;
this.fuel_type=fuel_type;
this.milage=milage;
System.out.println("car brand:"+brand+" car color:"+color+" car fuel-type:"+fuel_type+" car milage:"+milage+"km");
}
//end

//methods
public void start(){
System.out.println(brand+" it is well known car "+color+" is iconic color "+fuel_type+" is source and of milage "+milage+"km");
}

public void stop(){
System.out.println(brand+" it is well known car "+color+" is good color "+fuel_type+" is source and of milage "+milage+"km");
}

public void service(){
System.out.println(brand+" it is well known car for its speed "+color+" is beautiful color"+fuel_type+" is source and of milage "+milage+"km");
}
//end

public static void main(String[] args){

Car c1=new Car("BMW","Black","petrol",150);
c1.start();
Car c2=new Car("petrol","oddi","Blue",130);
c2.stop();
Car c3=new Car("red","Tesla","e-power",200);
c3.service();
}
}
```

Output:

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac car.java

C:\Users\kalva\OneDrive\Desktop\OOP>java car.java
car brand:Black car color:BMW car fuel-type:petrol car milage:150.0km
Black it is well known car BMW is iconic color petrol is source and of milage 150.0km
car brand:oddi car color:petrol car fuel-type:Blue car milage:130.0km
oddi it is well known car petrol is good color Blue is source and of milage 130.0km
car brand:Tesla car color:red car fuel-type:e-power car milage:200.0km
Tesla it is well known car for its speed red is beautiful colore-power is source and of milage 200.0km
```

Error Table -

s.no	Error	Rectification
1	Error in datatypes .	Make sure variables are double or float datatypes.
2	We might end up with wrong values at the output	We should make sure that Brackets and multiplication Symbols at correct order.

Task-2: Create a class named bank account with methods deposit and withdraw. Where the deposit method should accepts a parameter and when this method is called the deposited amount should be added to current balance. In addition to that when a withdraw method is called it has to verify whether the withdraw amount is less than the current balance. If not display message saying that there are insufficient funds. Use the constructor to display the details of the customer (Name, Account number, IFSC code, Branch). Also create two customer objects C1, C2.**Program:**

```
import java.util.Scanner;
class Bank_account{
long current_balance;
String name;
String account_number;
String IFSE;
String branch;

Scanner input=new Scanner(System.in);

 public Bank_account(long current_balance,String name,String account_number,String IFSE,String branch){
this.current_balance=current_balance;
this.name=name;
this.account_number=account_number;
this.IFSE=IFSE;
this.branch=branch;
System.out.println("User name:"+name+" account_number:"+account_number+" IFSE details:"+IFSE+" branch number:"+branch);
}

public void deposit(){
System.out.println("enter the depositing amount: ");
long deposit_amount=input.nextLong();
long sum=current_balance+deposit_amount;
System.out.println("the current blance after depoisting is "+ sum);
}

public void withdraw(){
System.out.println("enter the withdrawing amount: ");
long withdraw_amount=input.nextLong();
long dum=current_balance-withdraw_amount;
if(dum>0){
System.out.println("the current blance after withdrawal is "+ dum);}
else{
System.out.println("the current blance is insufficent ");
}
}

public static void main(String[] args){
Scanner input=new Scanner(System.in);
System.out.println("enter the Balance amount: ");
long amount=input.nextLong();
Bank_account a1=new Bank_account(amount,"balu","147852369","abcd","502278");
a1.deposit();
System.out.println("enter the Balance amount: ");
long amount1=input.nextLong();
Bank_account a2=new Bank_account(amount1,"sri","123654789","abcd","502278");
a2.withdraw();
}

}
```

Output:

```
C:\Users\kalva\OneDrive\Desktop\OOP>javac bank.java

C:\Users\kalva\OneDrive\Desktop\OOP>java bank.java
enter the Balance amount:
1500
User name:balu account_number:147852369 IFSE details:abcd branch number:502278
enter the depositing amount:
1200
the current blance after depoisting is 2700
enter the Balance amount:
2700
User name:sri account_number:123654789 IFSE details:abcd branch number:502278
enter the withdrawing amount:
2000
the current blance after withdrawal is 700
```

Error Table -

s.no	Error	Rectification
1	Error in datatypes .	Make sure variables are double or float datatypes.
2	We might end up with wrong values at the output	We should make sure that Brackets and multiplication Symbols at correct order.