ASSIGNMENT DAY-4

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Assignment: Day 4

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Problem Statement:

Greeting Function: Creating a function with a Name greetUser that takes String as an input and print a greeting statement with 3 different names by calling the function.

Algorithm:

Step 1: Start

Step 2: Create a function that takes strings as an input

Step 3: Print the input string name and close the function

Step 4: Create a for loop for taking names as input from the users

Step 5: Pass the name string to the function and call the function.

Step 6: End

Pseudo Code:

Function greetUser(name):

  Print "Hello, " + name + "!"

Main Program:

  Create a scanner to read input

  Repeat 3 times:

    Prompt user to enter a username

    Read input and store it in variable 's'

    Call greetUser(s)

Code:

```
 package Functions;
import java.util.Scanner;
public class GreetingFunction {
```

```
        public static void greetUser(String name) {
    System.out.println("Hello, " + name + "!");
  }

  public static void main(String[] args) {
    // Call the method three times with different names
//      greetUser("Alice");
//      greetUser("Bob");
//      greetUser("Charlie");

    Scanner sc=new Scanner(System.in);
    for(int i=0;i<3;i++) {
        System.out.println("enter the username: ");
        String s=sc.next();
        greetUser(s);
    }
  }
}
```

Test Cases:

Test Case no.	Input	Expected Output	Actual Output	Status(Pass/Fail)
TC1	Vishnu Priya sree	Hello, Vishnu! Hello, priya! Hello, Sree!	Hello, Vishnu! Hello, priya! Hello, Sree!	Pass
TC2	Adi Ved Ram	Hello, Adi! Hello, Ved! Hello, Ram!	Hello, Adi! Hello, Ved! Hello, Ram!	Pass
TC3	Leela Jay Hari	Hello, leela! Hello, jay! Hello, hari!	Hello, leela! Hello, jay! Hello, hari!	Pass

Output:

TC1:

```
enter the username:
vishnu
Hello, vishnu!
enter the username:
priya
Hello, priya!
enter the username:
sree
Hello, sree!
```

TC2:

```
enter the username:
adi
Hello, adi!
enter the username:
ved
Hello, ved!
enter the username:
ram
```

```
Hello, ram!
```

TC3:

```
enter the username:
leela
Hello, leela!
enter the username:
jay
Hello, jay!
enter the username:
hari
Hello, hari!
```

Observation:

- I was able to understand how the programs with function works
- The different way that I used is to use for loop for the user to pass the parameters and call the function.

Problem Statement:

Calculate Square: Take a number for n as an input. Then create a function that can calculate the square (n*n) of the number and returns its values.

Algorithm:

Step 1: Start

Step 2: Create a function that takes integer as an input

Step 3: Return the square of the number and close the function

Step 4: Seek the input from the user using scanner class

Step 5: Pass the number n to the function and call the function.

Step 6: End

Pseudo Code:

Function calculateSquare(number):

Return number * number

Main Program:

Create a scanner to read input

Read an integer input from the user and store it in variable 'n'

Call the function calculateSquare with 'n' as argument

Print "Square of n is: " followed by the result of the function

Code:

```
package Functions;
import java.util.Scanner;
public class CalculateSquare {

        public static int calculateSquare(int number) {
    return number * number;
  }

  public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        int n=sc.nextInt();
//      int result = calculateSquare(n);
//      System.out.println("Square of " +n+" is: " + result);
    System.out.println("Square of " +n+" is: " + calculateSquare(n));
  }

}
```

Test Cases:

Test Case no.	Input	Expected Output	Actual Output	Status(Pass/Fail)
TC1	4	16	16	Pass
TC2	-5	25	25	Pass
TC3	123	15129	15129	Pass

Output:

TC1:

```
4
Square of 4 is: 16
```

TC2:

```
-5
Square of -5 is: 25
```

TC3:

```
123
Square of 123 is: 15129
```

Observation:

- In the program, the working of return statement and using the print statement and function calling in same line.

Problem Statement:

Sum Two Number: Seek two inputs numbers of datadype double and call the function addNumber(double num1, double num2) and print the sum.

Algorithm:

Step 1: Start

Step 2: Create a function that takes double as input

Step 3: Return the sum of the numbers

Step 4: Seek the input numbers from the user

Step 5: Pass the numbers double to the function and call the function.

Step 6: End

Pseudo Code:

Function addNumbers(num1, num2):

Return num1 + num2

Main Program:

Create a scanner to read input

Print "Enter the 2 numbers: "

Read two double values and store in variables a and b

Call addNumbers(a, b) and store the result in variable 'sum'

Print "Sum of a and b is: " followed by the value of 'sum'

Code:

```
package Functions;
import java.util.Scanner;
public class SumTwoNumber {

        public static double addNumbers(double num1, double num2) {
    return num1 + num2;
  }

  public static void main(String[] args) {
    Scanner sc=new Scanner(System.in);
    System.out.println("enter the 2 number: ");
    double a=sc.nextDouble();
    double b=sc.nextDouble();
    double sum = addNumbers(a, b);
    System.out.println("Sum of "+a+" and "+b+" is: " + sum);
  }

}
```

Test Cases:

Test Case no.	Input	Expected Output	Actual Output	Status(Pass/Fail)
TC1	12,45	57	57.0	Pass
TC2	-45,53	8	8	Pass
TC3	12.6,56.34	68.94	68.94	Pass

Output:

TC1:

```
enter the 2 number:
12
45
Sum of 12.0 and 45.0 is: 57.0
```

TC2:

```
enter the 2 number:
-45
53
Sum of -45.0 and 53.0 is: 8.0
```

TC3:

```
enter the 2 number:
12.6
56.34
Sum of 12.6 and 56.34 is: 68.94
```

Problem Statement:

Create function that convert the temperature from Celsius to Fahrenheit and Fahrenheit to Celsius. Take input from the user and convert the temperature and print the value.

Algorithm:

Step 1: Start

Step 2: Create a functions that takes double as an input

Step 3: return the converted values and close the function

Step 4: Seek the input from the user and use if-else loop

Step 5: Pass the parameter to the function and call the function.

Step 6: Print the results

Step 7: End

Pseudo Code:

Function celsiusToFahrenheit(celsius):

Return (celsius * 9/5) + 32

Function fahrenheitToCelsius(fahrenheit):

Return (fahrenheit - 32) * 5/9

Main Program:

Create a scanner to read input

Print "Enter what you want to know 1. Celsius value 2. Fahrenheit value"

Read an integer and store it in variable 'a'

If a equals 1:

Print "Enter the Fahrenheit value:"

Read a decimal number and store in 'tempF'

Call fahrenheitToCelsius(tempF) and print the result with °C

Else:

Print "Enter the Celsius value:"

Read a decimal number and store in 'tempC'

Call celsiusToFahrenheit(tempC) and print the result with °F

Code:

```
package Functions;
import java.util.Scanner;
public class TemperatureConverter {

            public static double celsiusToFahrenheit(double celsius) {
                return (celsius * 9/5) + 32;
             }

             public static double fahrenheitToCelsius(double fahrenheit) {
                return (fahrenheit - 32) * 5/9;
             }

             public static void main(String[] args) {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter what you want to know 1.Celsius value   2.Fahrenheit value");
        int a=sc.nextInt();
        if(a==1) {
           System.out.println("enter the Fahrenheit value:");
                double tempF = sc.nextDouble();
                System.out.println(tempF + "°F = " + fahrenheitToCelsius(tempF) + "°C");
        }else {
           System.out.println("enter the Celsius value:");
           double tempC = sc.nextDouble();
```

```
            System.out.println(tempC + "°C = " + celsiusToFahrenheit(tempC) + "°F");
        }
            }

}
```

Test Cases:

Test Case no.	Input	Expected Output	Actual Output	Status(Pass/Fail)
TC1	1, 43.5	6.38	6.38	Pass
TC2	2, 23.4	74.12	74.12	Pass
TC3	2, -43.2	-45.76	-45.76	Pass

Output:

TC1:

```
Enter what you want to know 1.Celsius value   2.Fahrenheit value
1
enter the Fahrenheit value:
43.5
43.5°F = 6.388888888888889°C
```

TC2:

```
Enter what you want to know 1.Celsius value   2.Fahrenheit value
2
enter the Celsius value:
23.4
23.4°C = 74.12°F
```

TC3:

```
Enter what you want to know 1.Celsius value   2.Fahrenheit value
2
enter the Celsius value:
-43.2
-43.2°C = -45.760000000000005°F
```

Problem Statement:

Price Calculator: Create a function that can calculate the discount and the tax add on the item values and give the total price of the item

Algorithm:

Step 1: Start

Step 2: Create a functions that takes double as an input

Step 3: Return the values after adding the tax or subtracting the

Step 4: Take the item price, discount on it and also the tax rate

Step 5: Pass the parameters to the function and call the function.

Step 6: Print the values

Step 7: End

Pseudo Code:

Function calculateDiscount(originalPrice, discountPercentage):

Return originalPrice * (discountPercentage / 100)

Function calculateTax(amount, taxRate):

Return amount * (taxRate / 100)

Function calculateFinalPrice(itemPrice, discountPerc, taxRate):

discount = calculateDiscount(itemPrice, discountPerc)

discountedPrice = itemPrice - discount

tax = calculateTax(discountedPrice, taxRate)

Return discountedPrice + tax

Main Program:

Create a scanner to read input

Print "Enter the price of the item:"

Read a decimal number into originalPrice

Print "Enter the discount %:"

Read a decimal number into discountPercent

Print "Enter the tax %:"

Read a decimal number into taxRate

Call calculateFinalPrice(originalPrice, discountPercent, taxRate) and store result in finalPrice

Print "Final Price: ₹" followed by finalPrice

Code:

```
package ScopeModularity;
import java.util.Scanner;
public class PriceCalculator {

        public static double calculateDiscount(double originalPrice, double discountPercentage) {
            return originalPrice * (discountPercentage / 100);
        }

        // Calculate tax amount
        public static double calculateTax(double amount, double taxRate) {
```

```
        return amount * (taxRate / 100);
    }

    // Final price = discounted price + tax on discounted price
    public static double calculateFinalPrice(double itemPrice, double discountPerc, double taxRate) {
        double discount = calculateDiscount(itemPrice, discountPerc);
        double discountedPrice = itemPrice - discount;
        double tax = calculateTax(discountedPrice, taxRate);
        return discountedPrice + tax;
    }

    public static void main(String[] args) {
            Scanner c=new Scanner(System.in);
            System.out.println("enter the price of the item: ");
        double originalPrice = c.nextDouble();
        System.out.println("enter the disciunt %: ");
        double discountPercent = c.nextDouble();
        System.out.println("enter the tax %: ");
        double taxRate = c.nextDouble();

        double finalPrice = calculateFinalPrice(originalPrice, discountPercent, taxRate);
        System.out.println("Final Price: ₹" + finalPrice);
    }
}
```

Test Cases:

Test Case no.	Input	Expected Output	Actual Output	Status(Pass/Fail)
TC1	1200 12 3	1087.68	1087.68	Pass
TC2	1420 15 7	1291.49	1291.49	Pass
TC3	4325 5.2 3	4223.103	4223.103	Pass

Output:

TC1:

```
enter the price of the item:
1200
enter the disciunt %:
12
enter the tax %:
3
Final Price: ₹1087.68
```

TC2:

```
enter the price of the item:
1420
enter the disciunt %:
```

```
15
enter the tax %:
7
Final Price: ₹1291.49
```

TC3:

```
enter the price of the item:
4325
enter the disciunt %:
5.2
enter the tax %:
3
Final Price: ₹4223.103
```

Problem Statement:

Customizable Greeting: Create 3 functions with same names but with different parameters. Take the input from the user and print greeting accordingly

Algorithm:

Step 1: Start

Step 2: Create a functions with same names but different parameter

Step 3: take input from the user and call the function according to the input

Step 4: Print greeting.

Step 5: End

Pseudo Code:

Function customGreet(name, greeting):

  Print greeting + ", " + name + "!"

Function customGreet(name):

  Print "Hello, " + name + "!"

Function customGreet():

  Print "Hi there!"

Main Program:

  Call customGreet("vishnu", "Welcome")

  Call customGreet("priya")

  Call customGreet()

Code:

```
package AdvancedFunction;

public class CustomizableGreeting {
```

```
        public static void customGreet(String name, String greeting) {
    System.out.println(greeting + ", " + name + "!");
  }

  public static void customGreet(String name) {
    System.out.println("Hello, " + name + "!");
  }

  public static void customGreet() {
    System.out.println("Hi there!");
  }

  public static void main(String[] args) {

    customGreet("vishnu", "Welcome");
    customGreet("priya");
    customGreet();
  }

}
```

Test Cases:

Test Case no.	Input	Expected Output	Actual Output	Status(Pass/Fail)
TC1	Vishnu ,welcome Priya -	Welcome, Vishnu! Hello, Priya! Hi, there!	Welcome, Vishnu! Hello, Priya! Hi, there!	Pass
TC2	Adhu - Sree,GM	Hello, Adhu! Hi there! GM, Sree!	Hello, Adhu! Hi there! GM, Sree!	Pass
TC3	123 Ved,Congrats happy	Hello, 123! Congrats, Ved! Hello, happy!	Hello, 123! Congrats, Ved! Hello, happy!	Pass

Output:

TC1:

```
Welcome, vishnu!
Hello, priya!
Hi there!
```

TC2:

```
Hello, Adhu!
Hi there!
GM, Sree!
```

TC3:

```
Hello, 123!
Congrats, Ved!
Hello, happy!
```

Problem Statement:

Trace the flow: Create 3 functions such that the when A is called A Request Band C to be Call and C print results.

Algorithm:

Step 1: Start

Step 2: Create a functiona A,B and C

Step 3: Call the functionA

Step 4: FunctionA calls FunctionB

Step 5: FunctionB preforms some operation and returns results

Step 6: FunctionA Calls FunctionC to print the results

Step 7: End

Pseudo Code:

Declare a global Scanner 'sc' to read input

Function functionA():

  result = Call functionB()

  Call functionC(result)

Function functionB():

  Print "Enter the number:"

  Read integer input into variable 'value'

  Return value * 2

Function functionC(number):

  Print "Final result from function C: " + number

Main Program:

  Call functionA()

Code:

```
package AdvancedFunction;
import java.util.Scanner;
public class TraceTheFlow {
		static Scanner sc=new Scanner(System.in);
		public static void functionA() {
	int result = functionB();
	functionC(result);
  }

  public static int functionB() {
		System.out.println("enter the number: ");
	int value =sc.nextInt();
```

```
        return value * 2;
    }

    public static void functionC(int number) {
        System.out.println("Final result from function C: " + number);
    }

    public static void main(String[] args) {
        functionA();
    }

}
```

Test Cases:

Test Case no.	Input	Expected Output	Actual Output	Status(Pass/Fail)
TC1	6	12	12	Pas
TC2	5	10	10	Pass
TC3	-6	-6	-12	Pass

Output:

TC1:

```
enter the number:
6
Final result from function C: 12
```

TC2:

```
enter the number:
5
Final result from function C: 10
```

TC3:

```
enter the number:
-6
Final result from function C: -12
```

Problem Statement:

Power Calculator: create a function that can calculate the power of the value enter. Compare it with the function Math.pow() and print the results.

Algorithm:

Step 1: Start

Step 2: Create a function that calculate the power of the number

Step 3: Seek the input from the user and return the results

Step 4: compare the results with inbuilt function math.pow

Step 5: Print the results.

Step 6: End

Pseudo Code:

Function myPower(base, exponent):

Set result = 1

Repeat from i = 1 to exponent:

result = result * base

Return result

Main Program:

Create a scanner to read input

Print "Enter the base value"

Read integer and store in variable 'base'

Print "Enter the exponent value"

Read integer and store in variable 'exponent'

customPower = Call myPower(base, exponent)

Print "myPower(base, exponent) = " + customPower

mathPower = Use built-in function Math.pow(base, exponent)

Print "Math.pow(base, exponent) = " + mathPower

Code:

```
package AdvancedFunction;
import java.util.Scanner;
public class PowerCalculator {

        public static int myPower(int base, int exponent) {
    int result = 1;
    for(int i = 1; i <= exponent; i++) {
      result *= base;
    }
    return result;
  }

  public static void main(String[] args) {
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the base value");
    int base = sc.nextInt();
    System.out.println("enter the exponent value");
    int exponent = sc.nextInt();
```

```
        int customPower = myPower(base, exponent);
        System.out.println("myPower(" + base + ", " + exponent + ") = " + customPower);

        double mathPower = Math.pow(base, exponent);
        System.out.println("Math.pow(" + base + ", " + exponent + ") = " + mathPower);
    }

}
```

Test Cases:

Test Case no.	Input	Expected Output (myPower)	Actual Output (math.pow)	Status(Pass/Fail)
TC1	7,3	343	343.0	Pass
TC2	4,7	16384	16384.0	Pass
TC3	4,6	4096	4096.0	Pass

Output:

TC1:

```
enter the base value
7
enter the exponent value
3
myPower(7, 3) = 343
Math.pow(7, 3) = 343.0
```

TC2:

```
enter the base value
4
enter the exponent value
7
myPower(4, 7) = 16384
Math.pow(4, 7) = 16384.0
```

TC3:

```
enter the base value
4
enter the exponent value
6
myPower(4, 6) = 4096
Math.pow(4, 6) = 4096.0
```