**LAB-3**

Using conditional statements and looping statements, construct a Java program for a scientific calculator. Your program should have a top-level menu like:

1. Arithmetic Calculations
2. Logarithmic Calculations
3. Trigonometry Calculations
4. Converter

Upon choosing an option, display a sub-menu for each top-menu and upon choosing an option from the sub-menu, read relevant data from the user and perform the corresponding operation and print the result. Your program should exit only when the user types your registration number.

**CODE:**

import java.util.Scanner;

import java.lang.Math;

public class q1

{

public static void main(String args[])

{

int choice;

Scanner in = new Scanner(System.in);

while (true)

{

System.out.println("1.Arithmetic 2.Logarithmic 3.Trigonometric 4.Converter 5.Exit");

System.out.print("Enter your choice: ");

choice = in.nextInt();

if (choice == 1)

{

System.out.println("1.Add 2.Sub 3.Mul 4.Div");

System.out.print("Enter your choice: ");

choice = in.nextInt();

System.out.print("Enter two nos: ");

int a = in.nextInt();

int b = in.nextInt();

switch (choice)

{

case 1:

System.out.println("Sum: " + a + "+" + b + " = " + (a + b));

break;

case 2:

System.out.println("Difference: " + a + "-" + b + " = " + (a - b));

break;

case 3:

System.out.println("Product: " + a + "\*" + b + " = " + (a \* b));

break;

case 4:

System.out.println("Quotient: " + a + "/" + b + " = " + (float) a / b);

break;

default:

System.out.println("Invalid Input");

break;

}

}

else if(choice==2)

{

System.out.println("1.Natural Log 2.Log 3.Natural Antilog 4.Antilog");

System.out.print("Enter your choice: ");

choice = in.nextInt();

double n,result,base, e=2.718281828459045;

switch (choice)

{

case 1:

System.out.print("Enter number: ");

n = in.nextDouble();

result=Math.log(n) / Math.log(e);

result = Math.round(result\*Math.pow(10,9))/Math.pow(10,9);

System.out.println("Natural Log("+n+"): " + (result));

break;

case 2:

System.out.print("Enter base: ");

base = in.nextDouble();

System.out.print("Enter number: ");

n = in.nextDouble();

result=Math.log(n) / Math.log(base);

result = Math.round(result\*Math.pow(10,9))/Math.pow(10,9);

System.out.println("Log("+n+") with base "+base+" = " + (result));

break;

case 3:

System.out.print("Enter number: ");

n = in.nextDouble();

result= Math.pow(e,n);

result = Math.round(result\*Math.pow(10,6))/Math.pow(10,6);

System.out.println("Natural Antilog: e^("+n+") = " + (result));

break;

case 4:

System.out.print("Enter base: ");

base = in.nextDouble();

System.out.print("Enter number: ");

n = in.nextDouble();

result=Math.pow(base,n);

result = Math.round(result\*Math.pow(10,6))/Math.pow(10,6);

System.out.println("Antilog: "+base+"^("+n+") = " + (result));

break;

default:

System.out.println("Invalid Input");

break;

}

}

else if(choice==3)

{

System.out.println("1.Sin 2.Cos 3.Tan 4.Sin\_Inverse 5.Cos\_Inverse 6.Tan\_Inverse");

System.out.print("Enter your choice: ");

choice = in.nextInt();

double result,n,m;

switch (choice)

{

case 1:

System.out.print("Enter Angle in Degrees: ");

n = in.nextDouble();

m = Math.toRadians(n);

result=Math.sin(m);

result = Math.round(result\*Math.pow(10,9))/Math.pow(10,9);

System.out.println("Sin("+n+") = " + (result));

break;

case 2:

System.out.print("Enter Angle in Degrees: ");

n = in.nextDouble();

m = Math.toRadians(n);

result=Math.cos(m);

result = Math.round(result\*Math.pow(10,9))/Math.pow(10,9);

System.out.println("Cos("+n+") = " + (result));

break;

case 3:

System.out.print("Enter Angle in Degrees: ");

n = in.nextDouble();

m = Math.toRadians(n);

result=Math.tan(m);

result = Math.round(result\*Math.pow(10,9))/Math.pow(10,9);

System.out.println("Tan("+n+") = " + (result));

break;

case 4:

System.out.print("Enter value: ");

n = in.nextDouble();

result=Math.asin(n);

result = Math.toDegrees(result);

result = Math.round(result\*Math.pow(10,9))/Math.pow(10,9);

System.out.println("Sin\_Inv("+n+") = " + (result));

break;

case 5:

System.out.print("Enter value: ");

n = in.nextDouble();

result=Math.acos(n);

result = Math.toDegrees(result);

result = Math.round(result\*Math.pow(10,9))/Math.pow(10,9);

System.out.println("Cos\_Inv("+n+") = " + (result));

break;

case 6:

System.out.print("Enter value: ");

n = in.nextDouble();

result=Math.atan(n);

result = Math.toDegrees(result);

result = Math.round(result\*Math.pow(10,9))/Math.pow(10,9);

System.out.println("Tan\_Inv("+n+") = " + (result));

break;

default:

System.out.println("Invalid Input");

break;

}

}

else if(choice==4)

{

System.out.println("1.Length 2.Weight 3.Temperature");

System.out.print("Enter your choice: ");

choice = in.nextInt();

double result;

switch (choice)

{

case 1:

double length;

System.out.println("1.m to km 2.m to cm 3.cm to km 4.km to cm");

System.out.print("Enter your choice: ");

choice = in.nextInt();

switch(choice)

{

case 1:

System.out.print("Enter length in meter: ");

length=in.nextDouble();

result=length/1000;

System.out.println("Converted Length:" + (result)+"km");

break;

case 2:

System.out.print("Enter length in meter: ");

length=in.nextDouble();

result=length\*100;

System.out.println("Converted Length:" + (result)+"cm");

break;

case 3:

System.out.print("Enter length in cm: ");

length=in.nextDouble();

result=(length/100)/1000;

System.out.println("Converted Length:" + (result)+"km");

break;

case 4:

System.out.print("Enter length in km: ");

length=in.nextDouble();

result=length\*100\*1000;

System.out.println("Converted Length:" + (result)+"cm");

break;

default:

System.out.println("Invalid Input");

break;

}

break;

case 2:

double weight;

System.out.println("1.g to kg 2.g to mg 3.mg to kg 4.kg to mg");

System.out.print("Enter your choice: ");

choice = in.nextInt();

switch(choice)

{

case 1:

System.out.print("Enter weight in g: ");

weight=in.nextDouble();

result=weight/1000;

System.out.println("Converted weight:" + (result)+"kg");

break;

case 2:

System.out.print("Enter weight in g: ");

weight=in.nextDouble();

result=weight\*1000;

System.out.println("Converted weight:" + (result)+"mg");

break;

case 3:

System.out.print("Enter weight in mg: ");

weight=in.nextDouble();

result=(weight/1000)/1000;

System.out.println("Converted weight:" + (result)+"kg");

break;

case 4:

System.out.print("Enter weight in kg: ");

weight=in.nextDouble();

result=weight\*1000\*1000;

System.out.println("Converted weight:" + (result)+"mg");

break;

default:

System.out.println("Invalid Input");

break;

}

break;

case 3:

double temp;

System.out.println("1.celsius to fahrenheit 2.celsius to kelvin");

System.out.println("3.fahrenheit to celsius 4.fahreheit to kelvin");

System.out.println("5.kelvin to celsius 6.kelvin to fahrenheit");

System.out.print("Enter your choice: ");

choice = in.nextInt();

switch(choice)

{

case 1:

System.out.print("Enter temperature in celsius: ");

temp=in.nextDouble();

result=(((double)9/5)\*temp)+32;

result = Math.round(result\*Math.pow(10,2))/Math.pow(10,2);

System.out.println("Converted Temperature:" + (result)+" deg F");

break;

case 2:

System.out.print("Enter temperature in celsius: ");

temp=in.nextDouble();

result=temp+273.15;

result = Math.round(result\*Math.pow(10,2))/Math.pow(10,2);

System.out.println("Converted Temperature:" + (result)+" Kelvin");

break;

case 3:

System.out.print("Enter temperature in fahrenheit: ");

temp=in.nextDouble();

result=(temp-32)\*(double)5/9;

result = Math.round(result\*Math.pow(10,2))/Math.pow(10,2);

System.out.println("Converted Temperature:" + (result)+" deg C");

break;

case 4:

System.out.print("Enter temperature in fahrenheit: ");

temp=in.nextDouble();

result=((temp-32)\*(double)5/9)+273.15;

result = Math.round(result\*Math.pow(10,2))/Math.pow(10,2);

System.out.println("Converted Temperature:" + (result)+" Kelvin");

break;

case 5:

System.out.print("Enter temperature in kelvin: ");

temp=in.nextDouble();

result=temp-273.15;

result = Math.round(result\*Math.pow(10,2))/Math.pow(10,2);

System.out.println("Converted Temperature:" + (result)+" deg C");

break;

case 6:

System.out.print("Enter temperature in kelvin: ");

temp=in.nextDouble();

result=((temp-273.15)\*(double)9/5+32);

result = Math.round(result\*Math.pow(10,2))/Math.pow(10,2);

System.out.println("Converted Temperature:" + (result)+" deg F");

break;

default:

System.out.println("Invalid Input");

break;

}

break;

default:

System.out.println("Invalid Input");

break;

}

}

else if(choice==5)

break;

System.out.println();

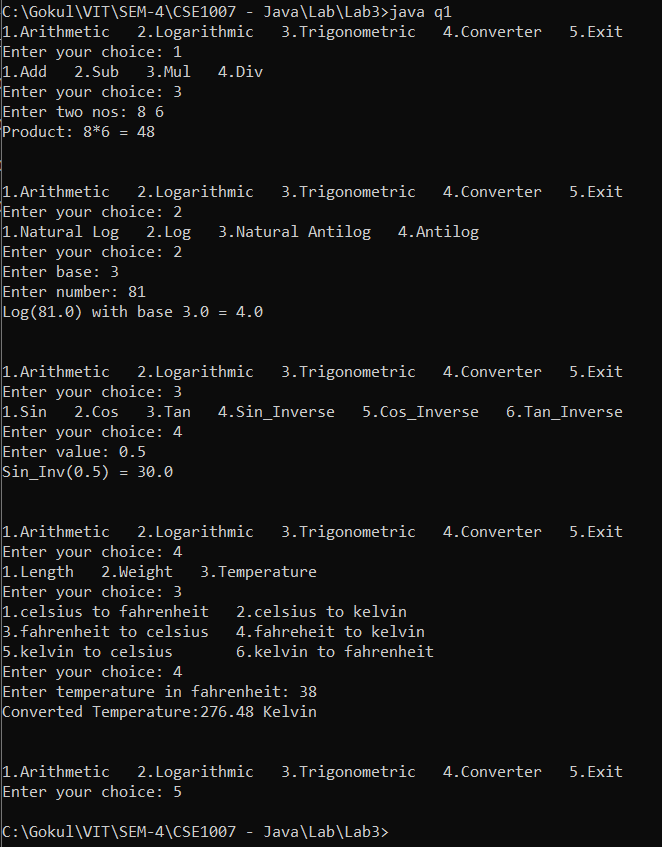
System.out.println();

}

}

}

**OUTPUT:**

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