

# Experiment 11

Code

```
clc;
clear;

disp("prattayaya amrit");
disp("13601 | 23025558021");
disp("B.Sc (H) Electronics");
disp("Comparison with the plots of their Taylor Series
expansion till first 10 terms");

x = input("enter the value of angle in degree: ");
a = input("enter the initial value in degree: ");
h = x - a;
x = (x * %pi)/180;
a = (a * %pi)/180;
h = (h * %pi)/180;
disp(h);
n = input("enter the number of terms of taylor series: ");
Ch = input("enter 1 to choose sine function, 2 to choose
cosine function, 3 to choose tangent function : ");

if Ch == 1 then
    f = 0;
    for i = 0:n-1
        if modulo(i, 2) == 0 then
            df = (-1)^(i/2) * sin(a)
        else
            df = (-1)^((i-1)/2) * cos(a)
        end
        f = f + ((h^i) * df)/ factorial(i)
        disp("The taylor series of sin(a+h) is ", f);
    end
    disp("The actual value of sin(x) is ",sin(x));
elseif Ch == 2 then
    g = 0;
    for i = 0:n-1
        if modulo(i, 2) == 0 then
            df1 = (-1)^(i/2) * cos(a)
        else
            df1 = (-1)^((i+1)/2) * sin(a)
        end
        g = g + ((h^i) * df1)/ factorial(i)
        disp("The taylor series of cos(a+h) is ", g);
    end
    disp("The actual value of cos(x) is ",cos(x));
else
    m = 0;
    f = 0;
```

```

g = 0;
for i = 0:n-1
    if modulo(i, 2) == 0 then
        df = (-1)^(i/2) * sin(a)
        df1 = (-1)^(i/2) * cos(a)
    else
        df = (-1)^((i-1)/2) * cos(a)
        df1 = (-1)^((i+1)/2) * sin(a)
    end
    f = f + ((h^i) * df)/ factorial(i)
    g = g + ((h^i) * df1)/ factorial(i)
    m = f/g;
    disp("The taylor series of tan(a+h) is ", m);
end
disp("The actual value of tan(x) is ",tan(x));
end

```

```

"prattayaya amrit"
"13601 | 23025558021"
"B.Sc (H) Electronics"
"Comparison with the plots of their Taylor Series expansion till first 10 terms"
enter the value of angle in degree: 45

enter the initial value in degree: 30

0.2617994
enter the number of terms of taylor series: 10

enter 1 to choose sine function, 2 to choose cosine function, 3 to choose tangent function : 1

"The taylor series of sin(a+h) is "
0.5000000
"The taylor series of sin(a+h) is "
0.7267249
"The taylor series of sin(a+h) is "
0.7095902
"The taylor series of sin(a+h) is "
0.7070003
"The taylor series of sin(a+h) is "
0.7070981
"The taylor series of sin(a+h) is "
0.7071070
"The taylor series of sin(a+h) is "
0.7071068
"The taylor series of sin(a+h) is "
0.7071068
"The taylor series of sin(a+h) is "
0.7071068
"The taylor series of sin(a+h) is "
0.7071068
"The actual value of sin(x) is "
0.7071068

-->

```