Source Code

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//

#include <iostream>

#include <cmath>

#include <math.h>

#include <iomanip>

# define M\_PI 3.14159265358979323846

using namespace std;

double degreesToRadians(double angle\_in\_degrees);

double Factorial(double number);

double Sine(double angle\_in\_radians);

double Cosine(double angle\_in\_radians);

double Secant(double angle\_in\_radians);

double Cosecant(double angle\_in\_radians);

double Tangent(double angle\_in\_radians);

double CoTangent(double angle\_in\_radians);

void PrintTrigTable();

void PrintTrigTableHeader();

void PrintTrigTableRecord(double angle\_in\_degrees);

// The function main() is complete you will need to implement PrintTrigTable which will print the table

int main()

{

PrintTrigTable();

return 0;

}

// Provided Stub functions - You will need to implement the function body

double degreesToRadians(double angle\_in\_degrees)

{

double angle\_in\_radians = angle\_in\_degrees \* M\_PI / 180.0;

return angle\_in\_radians;

}

double Factorial(double number)

{

double total = 1.0;

double other = number;

for (double i = 0.0; i < other; i++) {

total \*= number;

number--;

}

return total;

}

double Sine(double angle\_in\_radians)

{

double diff = 1.0;

double total = 0.0;

double counter = 1.0;

double temp = 1.0;

double power;

double fact;

int negative = 1;

while (abs(diff) >= 0.001) {

if ((negative%2) == 0) {

power = pow(angle\_in\_radians, counter);

fact = Factorial(counter);

diff = temp - (power / fact);

temp = power / fact;

total -= (power / fact);

} else {

power = pow(angle\_in\_radians, counter);

fact = Factorial(counter);

diff = temp - (power / fact);

temp = power / fact;

total += (power / fact);

}

counter += 2.0;

negative ++;

}

return total;

}

double Cosine(double angle\_in\_radians)

{

double diff = 1.0;

double total = 1.0;

double counter = 2.0;

double temp = 1.0;

double power;

double fact;

int negative = 1;

while (abs(diff) >= 0.0001) {

if ((negative%2) != 0) {

power = pow(angle\_in\_radians, counter);

fact = Factorial(counter);

diff = temp - (power / fact);

temp = power / fact;

total -= (power / fact);

counter += 2.0;

negative ++;

} else if ((negative%2) == 0) {

power = pow(angle\_in\_radians, counter);

fact = Factorial(counter);

diff = temp - (power / fact);

temp = power / fact;

total += (power / fact);

counter += 2.0;

negative ++;

}

}

return total;

}

double Secant(double angle\_in\_radians)

{

return (1.0 / Cosine(angle\_in\_radians));

}

double CoTangent(double angle\_in\_radians)

{

return (Cosine(angle\_in\_radians) / Sine(angle\_in\_radians));

}

// Here is couple of functions to get you going.

double Cosecant(double angle\_in\_radians)

{

return (1.0/Sine(angle\_in\_radians));

}

double Tangent(double angle\_in\_radians)

{

return(Sine(angle\_in\_radians)/Cosine(angle\_in\_radians));

}

void PrintTrigTable()

{

// Display proper header

PrintTrigTableHeader();

// Than Add proper loop and call PrintTrigRecord() to display each record

// Sample call to PrintTrigRecord()

for (double x = 0.0; x <= 360.0; x+=15.0) {

double angle\_in\_degrees = x;

PrintTrigTableRecord(angle\_in\_degrees);

}

}

// Displays the TRIG table header

void PrintTrigTableHeader(){

// Finish me

cout << "DEGREES" << fixed << setw(12) << setprecision(4);

cout << "MY SINE" << fixed << setw(12) << setprecision(4);

cout << "MATH SINE" << fixed << setw(12) << setprecision(4);

cout << "COSINE" << fixed << setw(12) << setprecision(4);

cout << "MATH COSINE" << fixed << setw(13) << setprecision(4);

cout << "SECANT" << fixed << setw(13) << setprecision(4);

cout << "COSECANT" << fixed << setw(13) << setprecision(4);

cout << "TANGENT" << fixed << setw(12) << setprecision(4);

cout << "COTANGENT" << fixed << setw(12) << setprecision(4) << endl;

}

// This function is not complete please add cout statements and proper formatting for the rest of the trig functions

void PrintTrigTableRecord(double angle\_in\_degrees)

{

double angle\_in\_radians = degreesToRadians(angle\_in\_degrees);

cout << fixed << setw(5) << setprecision(0) << angle\_in\_degrees;

cout << fixed << setw(13) << setprecision(4) << Sine(angle\_in\_radians);

cout << fixed << setw(13) << setprecision(4) << sin(angle\_in\_radians); // Math library sine

cout << fixed << setw(13) << setprecision(4) << Cosine(angle\_in\_radians);

cout << fixed << setw(13) << setprecision(4) << cos(angle\_in\_radians);

cout << fixed << setw(13) << setprecision(4) << Secant(angle\_in\_radians);

cout << fixed << setw(13) << setprecision(4) << Cosecant(angle\_in\_radians);

cout << fixed << setw(13) << setprecision(4) << Tangent(angle\_in\_radians);

cout << fixed << setw(13) << setprecision(4) << CoTangent(angle\_in\_radians);

cout << endl;

}

Output Examples

\*\*\*This is properly formatted when viewed in cmd, alignment issues are only present when pasted into word \*\*\*

DEGREES MY SINE MATH SINE COSINE MATH COSINE SECANT COSECANT TANGENT COTANGENT

0 0.0000 0.0000 1.0000 1.0000 1.0000 inf 0.0000 inf

15 0.2588 0.2588 0.9659 0.9659 1.0353 3.8637 0.2679 3.7321

30 0.5000 0.5000 0.8660 0.8660 1.1547 2.0000 0.5774 1.7321

45 0.7071 0.7071 0.7071 0.7071 1.4142 1.4142 1.0000 1.0000

60 0.8660 0.8660 0.5000 0.5000 2.0000 1.1547 1.7321 0.5774

75 0.9659 0.9659 0.2588 0.2588 3.8637 1.0353 3.7321 0.2679

90 1.0000 1.0000 0.0000 0.0000158191066.2056 1.0000158191057.3059 0.0000

105 0.9659 0.9659 -0.2588 -0.2588 -3.8637 1.0353 -3.7320 -0.2679

120 0.8660 0.8660 -0.5000 -0.5000 -2.0000 1.1547 -1.7321 -0.5774

135 0.7071 0.7071 -0.7071 -0.7071 -1.4142 1.4142 -1.0000 -1.0000

150 0.5000 0.5000 -0.8660 -0.8660 -1.1547 2.0000 -0.5774 -1.7320

165 0.2588 0.2588 -0.9659 -0.9659 -1.0353 3.8637 -0.2679 -3.7321

180 -0.0000 0.0000 -1.0000 -1.0000 -1.0000-1294019.4867 0.0000 1294019.4912

195 -0.2588 -0.2588 -0.9659 -0.9659 -1.0353 -3.8637 0.2679 3.7321

210 -0.5000 -0.5000 -0.8660 -0.8660 -1.1547 -2.0000 0.5773 1.7321

225 -0.7071 -0.7071 -0.7071 -0.7071 -1.4142 -1.4142 1.0000 1.0000

240 -0.8660 -0.8660 -0.5000 -0.5000 -2.0000 -1.1547 1.7321 0.5774

255 -0.9659 -0.9659 -0.2588 -0.2588 -3.8637 -1.0353 3.7321 0.2679

270 -1.0000 -1.0000 -0.0000 -0.0000-44624702.6685 -1.000044624817.6211 0.0000

285 -0.9659 -0.9659 0.2588 0.2588 3.8637 -1.0353 -3.7321 -0.2679

300 -0.8660 -0.8660 0.5000 0.5000 2.0000 -1.1547 -1.7320 -0.5774

315 -0.7071 -0.7071 0.7071 0.7071 1.4142 -1.4142 -1.0000 -1.0000

330 -0.5000 -0.5000 0.8660 0.8660 1.1547 -2.0000 -0.5774 -1.7320

345 -0.2588 -0.2588 0.9659 0.9659 1.0353 -3.8637 -0.2680 -3.7320

360 0.0000 -0.0000 1.0000 1.0000 1.0000 3212659.2065 0.0000 3212658.9814

Process returned 0 (0x0) execution time : 0.119 s

Press any key to continue.