This C program calculates:

**LEGEND:** //Comments **Normal text Keywords String literals**

// Talen Phillips -- EE107-01 -- 25MAR2013 -- "Summation Calculator"

**#include <stdio.h>** //header file with definitions for basic functions

**int main (void)** //function information: "[output type] [name] ([input]) {[commands]}"

//This is analogous to "integer f(x)=...", **HOWEVER** there's no output,

//since the program ends when the function does.

//All "output" is done within the function itself.

//when function is called, it executes all commands in the curly brackets

**{**

//variable type definitions: "int" is integer and

//double is a very large variable type (can store larger numbers)

**int x;** //no initial value (user will define this)

**int n = 1;** //starting n at 1 for this program

**int a = -1;** //a is (-1)^n (starts at (-1)^1 = -1)

**double result = 1;** //sum at each increment

**double fact = 1;** //n! variable (starts at 1! = 1)

**double exp = 3;** //3^n variable (starts at 3^1 = 3)

**double sum;** //this is our running total (displayed after exiting loop)

//printf() and scanf() are functions defined in stdio.h

**printf("Enter a number: ");** //display this to the screen

**scanf("%d",&x);** //await user input. store in variable x

//"while(){}" is a function that starts a loop which executes the commands

//inside the curly brackets as long as the statement in parentheses remains true

//(it rechecks the statement after each iteration)

**while(n<=x)**

**{**

**result = (a/(exp\*fact));** //calculate current sum

**printf("a%-2i =%13.10f\n",n,result);** //display current sum

**sum = sum + result;** //add current sum to total sum

**fact = fact \* n;** //increment factorial

**exp = exp \* 3;** //increment exponent

**n = n + 1;** //increment n

**a = -a;** //"oscillate" a

**}**

**printf("\nS%-2i =%13.10f\n",n-1,sum);** //(lots of formatting)

**return 0;** //end program

}