Assignment 2 Design Doc

Tanya Gyanmote; cruzid:tgyanmot

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Details:

Writing and implementing sin, cos, sin−1 (arcsin), cos−1 (arccos), tan−1 (arctan), and log functions. The Taylor series will be used for sin, cos, and arcsin. arccos and arctan can be calculated from arcsin while implementing a square root function. As well as creating a main() program and acting as a test harness.

Puesdocode:

For sin(x)

1. will have some placeholder variables (i,x,n,etc)
2. Creating a for loop that goes till EPSILION
    a. Creating another loop for the factorial (2n+1)!
        i. Adding the value for the factorial together (fact *= i)
    b. Coding (-1)^n times (x^2n+1)
    c. Divding (x^2n) by the factorial
    d. Multiplying it all to (-1)^n

For cos(x)

1. will have some placeholder variables (i,x,n,etc)
2. Creating a for loop that goes till EPSILION
    e. Creating another loop for the factorial (2n)!

    i. Adding the value for the factorial together (fact times and add it i)

f. Coding (-1)^n times (x^2n)

g. Divding (x^2n) by the factorial

h. Multiplying it all to (-1) to the power of n

For arcsin(x)

1. Zn-1 - (Using sin(zn)-x)
2. Using cos(zn-1)
3. Divide 1 and 2 by eachother

For arccos(x)

1. Get pi from math.h
2. pi/2 - arcsin(x)

For arctan(x)

1. Using (x)
2. Using square root fcn for x^2+1 given in piazza
3. Diving arcsin(step 1 / 2)

Main file

1. creating bool opt for options a,b,c, etc;
2. Creating switch opt

3. for every case

    a. set boolean: true

    b. set pointer : corresponding mathlib.c function

4. Create a default case

5. Return Int

Files

1. mathlib.h: Supplied file, with yhe function prototypes for the math functions

2. mathlib.c: This file contains my math function implementations, as prototyped in mathlib.h.

3. mathlib-test.c: This file will contain the main() program and acts as a test harness for my math library. 4. Makefile: This is a file that will allow the grader to type make to compile your program.

5. README.md: This file will describe how to build and run my program and list the command-line options it accepts and what they do.

6. DESIGN.pdf: Describe the purpose of your program and communicate the overall design of the program with enough detail

7. WRITEUP.pdf: Discussion of the results for my tests.