Project Assignment

Module: Math

Title: Taylor Series Expansion of sin(x)

Description:

The Taylor series expansion for the value of sin(x) is given by:

$$\sin(x) \; = \; x \; - \; \frac{x^3}{3!} \; + \; \frac{x^5}{5!} \; - \; \frac{x^7}{7!} \; \cdots$$

where x is in radians.

Instructions:

Write a function that calculates the value of `sin(x)` to at least 6 decimal digits of precision.

Before you start coding, think about how much work you really need to do. Although you could use a recursive function to calculate this, that might not be necessary. What are the possible values of x? Of sin(x)? How quickly does this series expansion converge to a "good-enough" answer?

In your main() program, call your function for various values of x, and compare your results with the values given by `sinf` and `sind` in the standard math library.

Bonus:

Think of a few ways that you could calculate the corresponding value of cos(x).