CS115: Homework #3

This assignment is due by 04/27.
Homework should be sent to ar238@njit.edu
with a subject line read as: CS115/002 HW#03

Tasks: The target of this homework is to write a c++ program, named as proj03.cpp, which computes \( \sin(x) \) by using the Taylor series:

\[
\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \ldots = \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!} x^{2n+1}
\]

Your program will do the following tasks:

a) Print out your full name, student ID, and your email address.

b) Input a number of degree \( x \) and then convert it to radiant by \( x \times \pi/180 \) where \( \pi \) is using the build-in constant \( \text{M_PI} \) and the \#include \text{<cmath>} directive is needed.

c) Apply the above Taylor series by a while-loop: up until the term

\((-1)^n x^{(2n+1)}/(2n+1)!
\)

is smaller than \( .00001 \) where \( n! = n*(n-1)* \ldots *2*1 \) can be computed by a for-loop.

Compiler your program by using ‘g++ –std=c++11 –o proj01 proj01.cpp’ and then run the executable program ‘proj01’.

You need to submit your c++ program with a report which includes:

Your c++ program and the results came from executing your program. (Just copy and paste from your screen.)

If you are using AFS Unix system, then you can use ‘script’ to create your report. The following steps show you how to make it:
- On the prompt, type ‘script report’ where report is the output filename.
- Use ‘cat proj01.cpp’ to list your program.
- Use ‘g++ …’ to compile your program.
- Run your program.
- Use ‘Ctrl-D’ or ‘exit’ to exit script.
- The image to the right shows an example.