Design and implement and test a C++ program that solves the problem below using the information included.

The value of cos x can be approximated using the formula:

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} \ldots$$

Using this formula, write a C++ program that determines the number of terms needed to approximate the value returned by the cos function with an error less than **ε.**

Your test data should include the following angles, expressed here in degrees:

30, 45, 72, 192

Vary your epsilon from 10^{-2} *to* 10^{-4}. (Hint – this means you will do estimate the value of cos to within a value of 10^{-2} *to* 10^{-4}.)

Read in the angles from a file. Test for the end of the file. I recommend you test for other values as well, just use the values above for you final test.

Output should be to both a file and the screen. Output should look like:

Angle	10^{-2}	10^{-3}	10^{-4}	
30				
45				
72				
192				

With answers lined up in columns.

Due Date: Friday 11/8/2013
Turn in: All required documentation –
• Cover Page – name, program #, due date, course number and section
• Copy of assignment
• Design document(s) – algorithm, should be in depth
• Program source code
• Copy of output
• Reflection – should include challenges with algorithm development, new commands used, other programming challenges and comments on any 'surprises'. The reflection should be a written document with a beginning (what you set out to do), middle (what you did and what happened) and summary.

Additionally, drop the tarred and gzipped file in the dropbox.

Recommended steps:
Print cover page
Print extra copy of assignment
Write algorithm
Desk check algorithm using given data
Write reflection on algorithm development
Write code
Develop code template
Include in code template:
        Beginning comment section for program information, name, date, program
objectives
        Main and return
        Open/close main function
        Save code template for reuse
        Write comments within code to reflect algorithm
        Code per comments
        Revise code/algorithm/reflection as needed
Compile code
        Revise code/algorithm/reflection as needed
Execute code
        Revise code/algorithm/reflection as needed
Save output from final version of code