CSE 333 13su Exercise 0

out: Monday June 24, 2013
due: Wednesday June 26, 2013 by **9:00 am**.

One way to estimate π is to use the following infinite series, which was discovered by Nilakantha in the 15th century:

```
π = 3 + (4 / (2 x 3 x 4)) - (4 / (4 x 5 x 6)) + (4 / (6 x 7 x 8)) - ...
```

Breaking the series down:

- the zero'th term in the series is 3
- the first term in the series is +(4 / (2 x 3 x 4))
- the second term in the series is -(4 / (4 x 5 x 6))
- the nth term in the series is $(-1)^{(n+1)}$ x (4 / (2n x (2n+1) x (2n+2)))

Write a C program that estimates π by adding together terms 0 through n, inclusive, in the Nilakantha series, and prints out that estimate to 20 decimal places. "n" is provided to your program as a command-line argument. Your program, when compiled, should be called "ex0" and an example of how the user should invoke it, and the resulting output, is:

```
bash$ gcc -Wall -g -std=gnu99 -o ex0 ex0.c
bash$ ls
ex0     ex0.c
bash$ ./ex0 100
Our estimate of Pi is 3.14159241097198238535
bash$
```

Your code must:

- compile without errors or warnings
- have no crashes, memory leaks, or memory errors
- be contained in a single file called "ex0.c" that compiles with the command "gcc -Wall -g -std=gnu99 -o ex0 ex0.c" -- do not submit a Makefile.
- be pretty: the formatting, modularization, variable and function names, and so on must make us smile rather than cry.
- be robust: you should think about handling bogus input from the user, and you should handle hard-to-handle cases (if there are any) gracefully.
- have a comment at the top of your .c file with your name, student number, and CSE or UW email address.

You should submit your exercise using the assignment dropbox linked on the course main web page.