grade: check (upgrade to check + by addressing the points in blue below)

Activity 2

1) ✓

2) Code indindations can help the user, but also can be useful when compiling

3) errors:

a. "out" change to "cout"

b. missing double disc;

c. type specifier: int

d. rewrite code to pair X_1 and X_2 and x1p and x2p to use all variables set previously

4) X_1` and $X_2$ are going to be more accurate. Using these two ensures that $\epsilon_1$ and $\epsilon_2$ are not close in magnitude. Giving us a more accurate calculation. Using $x_1$ and $x_2$` give us $|\epsilon_s| >> \epsilon_m$, or a magnified error.

right!

5) a. I don't understand the difference between the "print out title to screen" portion and the "print titles to the plot file"

b. mine says int imax = 8, but only looped 7 times. Is that how its supposed to be.

c. not sure what "fabs" is or what it means.

floating point absolute value function

6) ✓

7) It worked when I manually typed the commands @ the gnuplot prompt, but not when I tried the "quad_eqn.plt" file.

8) My plot had two fairly straight lines

Summing Different Orders

1 in single precision
0 01111111 00000000000000...

1) When adding 1 and $5 \cdot 10^{-8}$ as your 1st part of the sum, they must both contain the same exponent. For 5.10^{-8} to be converted to decimal representation you run out of bits. This means what should be represented as 1+a, actually becomes 1+0+0+0.. and you will just get $\Sigma = 1$. Which is incorrect.

2) This addition should work better, because you don't have to convert "a" to a different exponent yet. Even though eventually the conversion will become too large, we will have a sufficient # of a's added together that the $\Sigma a + 1$ will actually give a number closer to 1.5 and not just 1

3) This time $5 \cdot 10^{-8}$ can be converted to the same exponent as 1 because we do not run out of bits in double precision. Therefor, 1+a is not going to be 1+0 anymore. We will get a close number, but maybe not exact.

↳ after running program:

It did agree ✓

4) NO

5) I got it to run, I compared the code

to precision.cpp and quadratic_equation_1.cpp to find the errors and find a format.

6) That created 20 (!!!) errors. I have no clue how to fix them now ∴

7) prediction

I expect epsreps t...+1 to be close to 1.5.
everything stayed the same? What did you get?
With 10^8 additions, the exact answer is 6. The a+a+...+1 result though should be counterintuitive at first glance. Can you explain it?

Bessel 1:

1) ✓

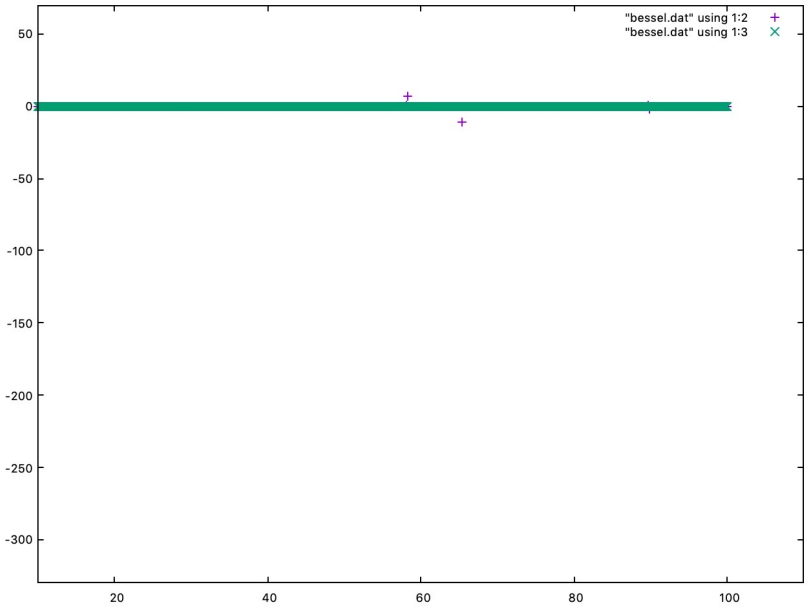
2) - the 1st column is the x value for the bessel function given w/ 6 digits

- the second uses the x values in column one to find the value of the function using the downward recursion relation starting from arbitrary $j_{max}(x)$
- the third uses the x values in column one to find the value of the function using the upward recursion relation starting from $j_0 = \frac{\sin x}{x}$ and

$j_1 = \frac{\sin x - x\cos x}{x^2}$

3) This is the best plot I could get, the commands in gnuplot> were not working

Something's not working with the plot. I can help in class if you can't get it working right.


"bessel.dat" using 1:2
"bessel.dat" using 1:3
50
0
-50
-100
-150
-200
-250
-300
20
40
60
80
100