GLG490/598 Numerical methods

Homework #2

Due 11:59pm, 02/04/2021

(100 points)

In Homework #1, you find the solution of the equation of $f(x) = x^3 + 2x - 5 = 0$ in the range of (0,2) analytically using calculator. In this homework #2, you need to write a C code to find this solution.

Assume $f_0 = f(x_0)$, $f_1 = f(x_1)$, $f_2 = f(x_2)$. Remember:

$$x_2 = \frac{x_0 f_1 - x_1 f_0}{f_1 - f_0}$$

Step 1: I have already done some parts of the code for you. You will need to add some more to the code I provide. The code is in the class materials, under the folder of homework, and is named as "**Homework-02-Li-StartCode.c**". Copy it to your own directory and rename it to something else.

Step 2: Instructions on how to finish the code are provided as comments in the Homework-01-Li-StartCode.c. Follow these instructions to add your own codes.

Step 3: Compile and run your code every time you add/change 1 or a few lines of code. Do not assume there is no mistake in the code, and it will run the first time it finishes.

Step 4: Confirm that your code works. Below is my output. You must get the EXACT SAME as mine.

```
Iteration # 1: 0.0000 2.0000 -5.0000 7.0000 0.8333 -2.7546
Iteration # 2: 0.8333 2.0000 -2.7546 7.0000 1.1628 -1.1022
Iteration # 3: 1.1628 2.0000 -1.1022 7.0000 1.2767 -0.3657
Iteration # 4: 1.2767 2.0000 -0.3657 7.0000 1.3126 -0.1133
Iteration # 5: 1.3126 2.0000 -0.1133 7.0000 1.3235 -0.0343
Iteration # 6: 1.3235 2.0000 -0.0343 7.0000 1.3269 -0.0103
Iteration # 7: 1.3269 2.0000 -0.0103 7.0000 1.3278 -0.0031
Iteration # 8: 1.3278 2.0000 -0.0031 7.0000 1.3281 -0.0009
```

How to submit your homework

1. Rename your code using the format of 'FirstName-LastName-HW02.c'
2. Send your *.c file to Mingming.Li@asu.edu and enter the email subject title as "Numerical Methods Homework 02"