CSE2202: Numerical Methods
Online: 1 Section: A1
Time: 40 Minutes Total: 10

Problem Statement: Determine the real root of the equation: $f(x) = x^3 - x - 1$ using bisection/false position method. Employ initial guesses of $X_{lower} = 1$ and $X_{upper} = 2$ and iterate until the estimated relative error ϵ_a falls below a level of $\epsilon_s = 0.0001$

Tasks:

1. Write a program using bisection/false position method to locate the approximate root of the function $f(x) = x^3 - x - 1$ with initial guesses [1, 2].
2. Iterate until the estimated relative error ϵ_a falls below a level of $\epsilon_s = 0.0001$
3. Use Horner's method to evaluate the function.
4. Use appropriate math function for your code.
5. Print the following table that show the values of approximate root, absolute error, relative error and change of limits for each iteration.
   [Hint:
   Absolute Error = $|new\ approximation\ of\ root - previous\ approximation\ of\ root|$
   Relative Error = $\left|\frac{new\ approximation\ of\ root - previous\ approximation\ of\ root}{new\ approximation\ of\ root}\right|$]

Sample Input/ Output:
Enter the highest degree of the equation: 3

Enter values of coefficients:
Coefficient x[3] =

Coefficient x[2] =

Coefficient x[1] =

Coefficient x[0] =
Enter initial guesses:
Table: Steps of Bisections /False Position Method

No. of Iteration	Approximate Root	Absolute Error	Relative Error	Change of Limit

Approximate Root: