ENGR 250 Numerical Methods using MATLAB
2015 Winter Quarter

Homework Assignment #3

Due : Feb 4 (Wednesday)

You should submit your script M-file, named **HW3_yourEmailAccount**, and all functions by email "pandrist@greenriver.edu" Before the due date - Feb 4 at 1 PM. Trial Time : Feb. 4 2:30 PM.

1. Bisection Method & False Position Method

Determine the roots of $f_2(x) = -13 - 20x + 19x^2 - 3x^3$:

- Using bisection method. Employ initial guesses of $x_l = -1$ and $x_u = 0$, and iterate until you are within 10^{-4} of the root. Save results (1×2 vector: [root, required number of iterations]) on **HW3_1.dat** file
- Using false position method. Employ initial guesses of $x_l = -1$ and $x_u = 0$,and again iterate until you are within 10^{-4} of the root. Save results (1×2 vector: [root, required number of iterations]) on **HW3_2.dat** file

2. False Position Method

Determine the real root of $x^{3.5} = 80$ with the false position method to within 10^{-5}. Use initial guesses of 1.0 and 5.0.

- save the real root on **HW3_3.dat** file
- save the required number of iterations on **HW3_4.dat** file

3. Newton-Raphson Method, & Secant Method

Determine the highest real root of $f_5(x) = 2x^3 - 11.7x^2 + 17.7x - 5$:

- Newton-Rapson method (five iterations, x_0=3).
  - save the root on **HW3_5.dat** file
  - save the function evaluated at the root after 5 iterations on **HW3_6.dat** file
- Secant method (five iterations, $x_{-1} = 3$, $x_0 = 4$).
  - save the root on **HW3_7.dat** file
  - save the function evaluated at the root on **HW3_8.dat** file

- Modified secant method (five iterations, $x_0 = 3$, $\delta = 0.1$).
    - save the root on **HW3_9.dat** file
    - save the function evaluated at the root on **HW3_10.dat** file

4. Secant Method

Determine the real root of $x^{3.5} = 80$, with the modified secant method to within 10^{-6} using an initial guess of $x_0 = 3.5$ and $\delta = 0.05$.

- save the root on **HW3_11.dat** file
- save the function evaluated at the root on **HW3_12.dat** file
- save the required number of iterations on **HW3_13.dat** file