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MA202 Numerical Techniques
LAB#6 Root Searching Methods

Exercise 1

A) Write routine in MatLab for finding the root of any given general function for each of the methods that we have discussed. The program should not only provide the root with the uncertainty/error, but also provide the user with the no. of iterations used to reach the root, which is indicative of the rate of convergence.
B) Use these routines to find roots of these two functions $f(x) = \ln(x) - 1$, and $g(x) = \tanh(x)$.

Exercise 2

Use Newton-Raphson's method to find the root of the function $f(x) = \text{sech}(x)$, using the initial guess as $x = 0$. Write in detail the output that you obtain and comment upon it.

Exercise 3

Find the root of the function $f(x) = \frac{1}{x}$, using all the four methods. Please comment upon the answer you find using each method.

Exercise 4

Find the root of $\sin(x)$ function when $0 < x < 2\pi$. Use each routine and comment upon the accuracy of the answer that you find and also the rate of convergence.