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1)

Solve the equation f(x)= x^3 - 0.165x^2 + 3.993*10^-4 with initial x_0 = 0.05 with an e=0.0001:

The root of the equation obtained after Newton raphsons method is x=0.062377576543465846
The number of iterations performed by the code are 3.

Solve the equation f(x)= x^3 - 0.165x^2 + 3.993*10^-4 with initial x_0 = 0.11 with an e=0.0001:

The roots cannot be found with an initial value x_0 = 0.11 as it is the root of the derivative of the function.
From Newton raphson method,

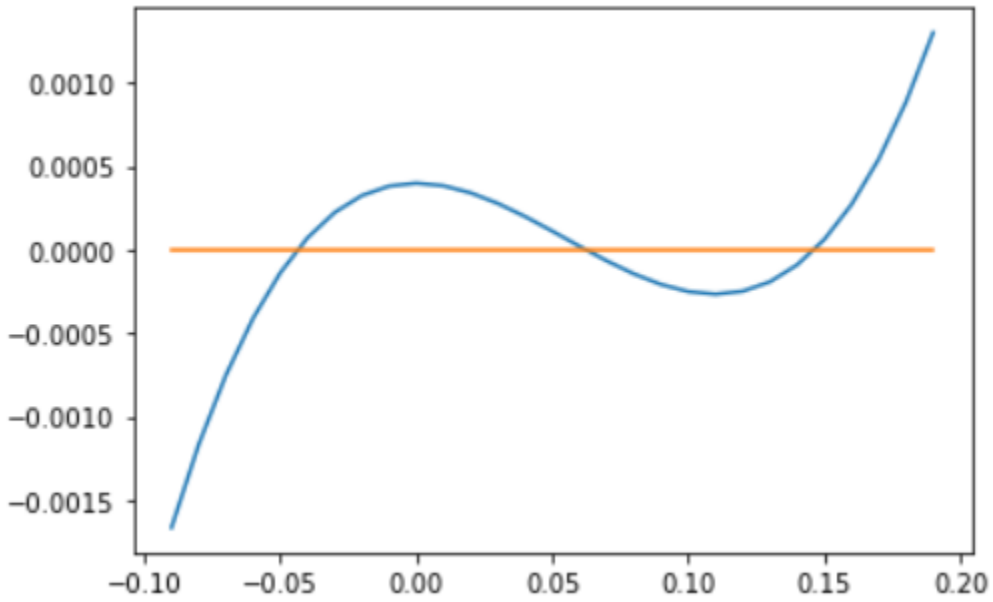
$$X_j = x_i - f(x_i)/f'(x_i)$$

The denominator here goes to zero for x_0 .
There exists a maxima at x=x_0 and newton raphson method cannot be used at the maxima of the function

Can you give an other point x_0 where newton raphson method cannot be applied?

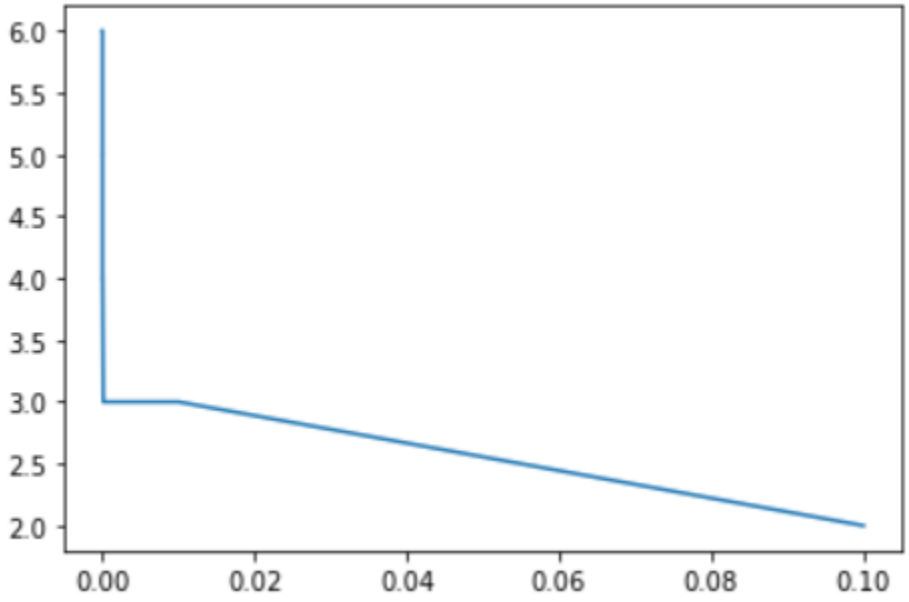
By plotting the function f(x) , we see that there exists an other maxima at x=0. So, the derivative again goes to zero at that point and newton raphson method cannot be applied.

PLOT:



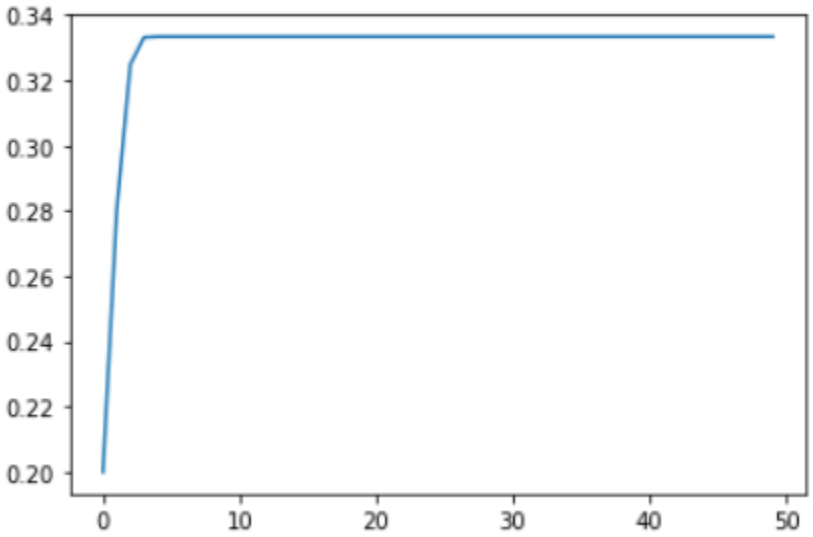
This is a x vs f(x) plot . The f(x) is having a maxima at x=0 and minima at x=0.11

Plot e vs number of steps needed for convergence:

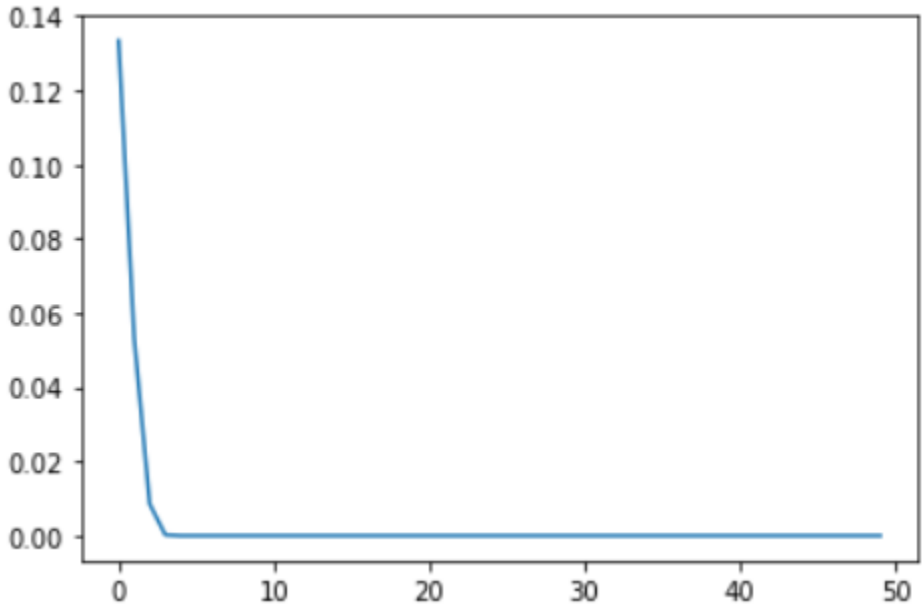


2)

Plot : Number of iterations vs the value:



Plot: Error vs Number of iterations:



We see that as the number of iterations increase, the error between the calculated value and the actual value is decreasing and tending to zero

3)We see that

For A:

The matrix is not strictly diagonal dominant at row 1
The matrix is not strictly diagonal dominant at row 2
The matrix is not strictly diagonal dominant at row 3
The matrix is not strictly diagonal dominant at row 4

So, the matrix is not strictly diagonal dominant.

For B:

The matrix is not strictly diagonal dominant at row 2
The matrix is not strictly diagonal dominant at row 3
The matrix is not strictly diagonal dominant at row 4

So, the matrix is not strictly diagonal dominant