MATHEMATICS
TEXAS A&M UNIVERSITY

MATH 609

NUMERICAL ANALYSIS

FALL 2022

LAB 07

SUMMARY RESULTS

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EXERCISE I: SOLVING NON-LINEAR EQUATIONS

(1) and (2)

```
PS C:\Users\melekderman\OneDrive - Texas A&M University\Desktop\Python\LABws\LAB7> python exercise1_1and2.py
Number of Iteration for Bisection Method:  25
Bisection Method Estimate: 1.1892071068286896
Accuracy: 6.871225721781259e-09
Number of Iteration for Newton Raphson Method:  5
Newton  Method Estimate: 1.1892071156761177
Accuracy: 5.685448714678587e-10
PS C:\Users\melekderman\OneDrive - Texas A&M University\Desktop\Python\LABws\LAB7>
```

(3)

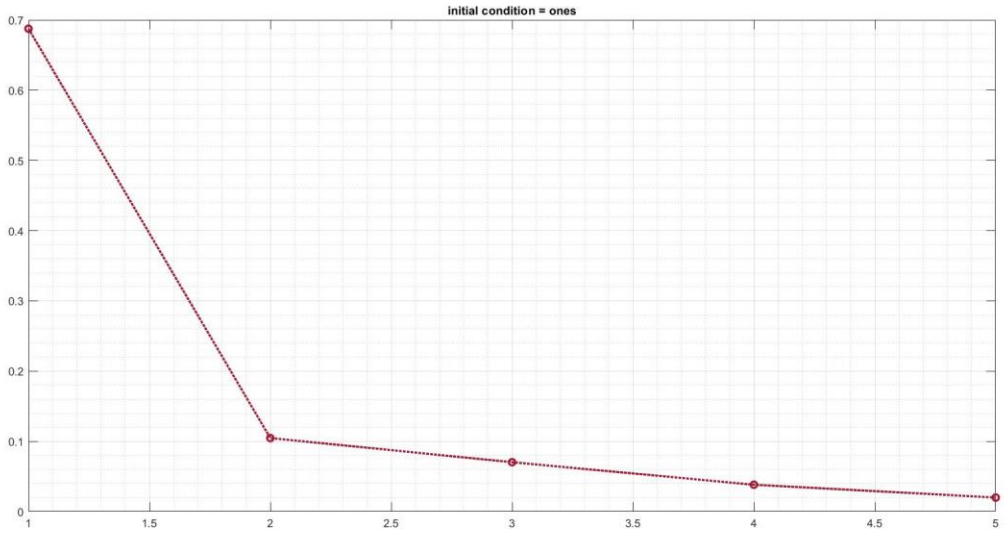
```
PS C:\Users\melekderman\OneDrive - Texas A&M University\Desktop\Python\LABws\LAB7> python exercise1_3.py
Number of Iteration for Bisection Method:  4
Bisection Method Estimate: 1.1875
Accuracy: 0.001435506883929207
Number of Iteration for Newton Method:  16
Newton Method Estimate: 1.1842794888554597
Accuracy: 0.004143623160663937
PS C:\Users\melekderman\OneDrive - Texas A&M University\Desktop\Python\LABws\LAB7>
```

EXERCISE II: NEWTON ITERATION FOR EIGENVALUE PROBLEMS

*The first matrix did not converge. This behavior also broke quadratic convergence.

Plots for A_2 matrix:

The number of iteration: 5 (initial guess = 1s)



The number of iteration: 17 (initial guess = 10s)