

Name: Caroline Ta  
 Course Name: CS3010.01 - Numerical Methods  
 Assignment: Programming Project 2  
 Date: 09/28/2020

The execution time recorded for each test case is as follows:

Methods	Number of Equations				
	4	20	50	70	100
Jacobi	0.0009979999999999	0.0195189999999999	0.0458749999999999	0.0482619999999999	0.0817809999999999
Gauss-Seidel	0.0000000000000000	0.0134279999999999	0.0099729999999999	0.0125729999999999	0.0309179999999999
Gaussian Elimination	0.0030729999999999	0.1485670000000000	0.2636650000000000	6.0957609999999954	17.7830629999999985

Comments:

As the number of equations to solve increases, the execution time also increases. The Gauss-Seidel method is the one with the fastest execution time, and the Gaussian Elimination method with Scaled Partial Pivoting is the one with the slowest execution time. Some problem may occur is that the relative approximate error becomes unchanged or an imaginary number before 50 iterations; the execution time may take much longer based on how many equations we are trying to solve.

I have included a graph below based on the execution time of each method for 4, 20, 50, 70, and 100 equations. However, to see more clearly the significant difference between the execution time of Gaussian Elimination method with Scaled Partial Pivoting vs. Jacobi Iterative method and Gauss-Seidel method, I stop the graph of Gaussian Elimination at 50 equations.

Equations vs. Execution Time

