Eric Chen

Naïve Gaussian Elimination Results

Using Naïve Gaussian Elimination:

x1: 0.21602476699023043

x2: -0.00791510608732474

x3: 0.6352433264885665

x4: 0.7461742760893735

Using Gaussian Elimination with SPP:

x1: 0.2160247670084124

x2: -0.007915106087778005

x3: 0.6352433264931054

x4: 0.7461742760857157

There is a slight difference between the two most likely because SPP is slightly more accurate due to it using the largest factor as the divisor. This helps to avoid roundoff errors which yields a more accurate result.

x1 Relative error = $\frac{|0.21602476699023043 - 0.2160247670084124|}{0.2160247670084124}$ = 8.416613637311 x 10^{-11}

x2 RE = $\frac{|-0.00791510608732474 - -0.007915106087778005|}{-0.007915106087778005}$ = -5.726581488274 x 10^{-11}

x3 Relative error = $\frac{|0.6352433264885665 - 0.6352433264931054|}{0.6352433264931054}$ = 7.145136061573 x 10^{-12}

x4 Relative error = $\frac{|0.7461742760893735 - 0.7461742760857157|}{0.7461742760857157}$ = 4.902071965263 x 10^{-12}

Overall, the difference in error between the two methods is relatively small. Taking the percent error of x1 would be 3.896 x 10^{-8} which is almost negligible.