

EAS596
HW5
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2.

The plot produced from problem 2 shows that the time at the start(smaller “n”s) is unstable and more of an decreasing trend, but after a point it increases progressively in an almost linear fashion.

This is because of the computational complexity of LU; for smaller “n”s it takes the computer little to no difference in computing, however as “n” increases, the computational complexity accumulates and increases the required time to calculate.

3.

Comparing the two types of Gram-Schmidt, there is no difference in output. The result will be the exact same output with the exact same precision. Since the classical Gram-Schmidt is column oriented and the modified Gram-Schmidt is row oriented

p3a)
Q =

0.1010	0.3536	0.3605
0.4041	0.3536	0.1495
0.7071	0.3536	-0.0615
0.4041	-0.3536	-0.7122
0.4041	-0.7071	0.5803

R =

9.8995	9.8995	10.7076
0	2.8284	4.2426
0	0	1.1606

p3b)

Q =

0.1010	0.3536	0.3605
0.4041	0.3536	0.1495
0.7071	0.3536	-0.0615
0.4041	-0.3536	-0.7122
0.4041	-0.7071	0.5803

R =

9.8995	9.8995	10.7076
0	2.8284	4.2426
0	0	1.1606

4.

The graph shows that the modified Gram-Schmidt will be more stable and will orthogonalized against any errors when in the process of computation in comparison to the classical Gram-Schmidt

5.

The Quadratic one is more appropriate .

Since Y has a curve upwards at a more faster progressive rate, the quadratic can show the change more accurately.