

CS206 Problem Set 2

1. NLA 6.1
2. NLA 6.4
3. NLA 7.1
4. Determine (on paper) classical and modified Gram-Schmidt orthogonalization for the vectors

$$a_1 = (1, \epsilon, 0, 0)^T, \quad a_2 = (1, 0, \epsilon, 0)^T, \quad a_3 = (1, 0, 0, \epsilon)^T$$

During your calculation, make the approximation $1 + \epsilon^2 \approx 1$.

5. NLA 7.3
6. NLA 8.2
7. Apply the `[Q, R]=mgs(A)` function you have written in the previous problem to the following matrix

$$A = \begin{bmatrix} 0.70000 & 0.70711 \\ 0.70001 & 0.70711 \end{bmatrix}$$

Check the orthogonality of Q matrix by calculating `norm(Q'*Q-eye(2))`. Compare the value returned by `mgs` vs the one returned by the `qr` function in Matlab.

8. NLA 10.1
9. NLA 10.2
10. NLA 10.3