M.Sc. in High-Performance Computing

5633A - Numerical Methods for High-performance Computing

Programming Assignment 2

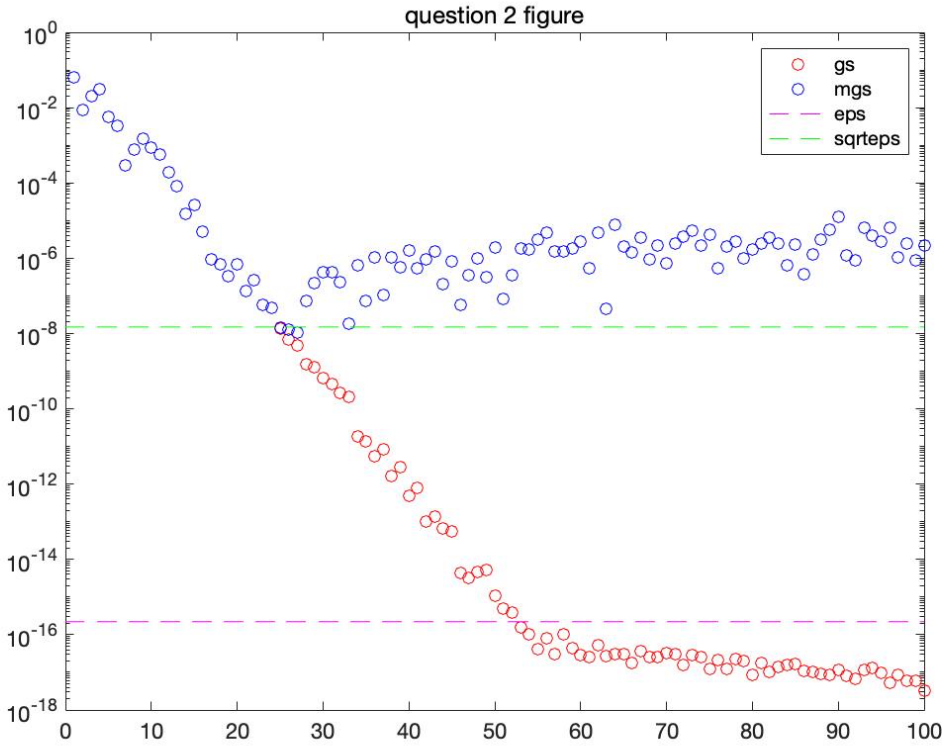
Min Zhang

Question 1:

3.7417	5.3452	6.9488
0	0.6547	1.3093
0	0	0.0000

3.7417	5.3452	6.9488
0	0.6547	1.3093
0	0	0.0000

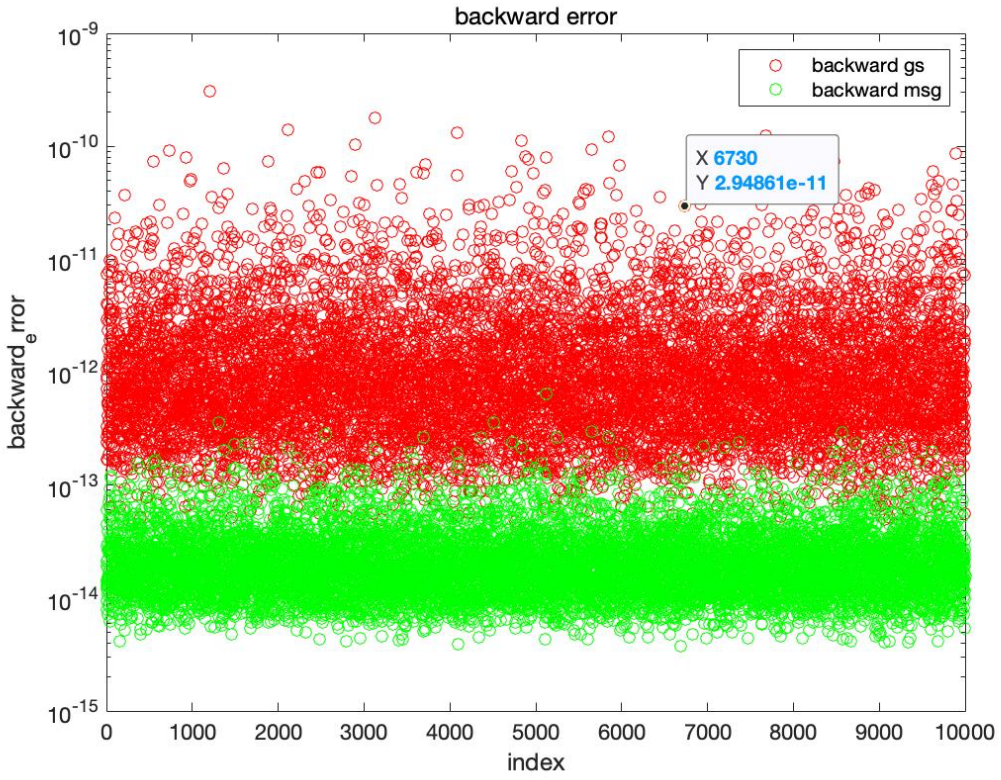
Question 2:

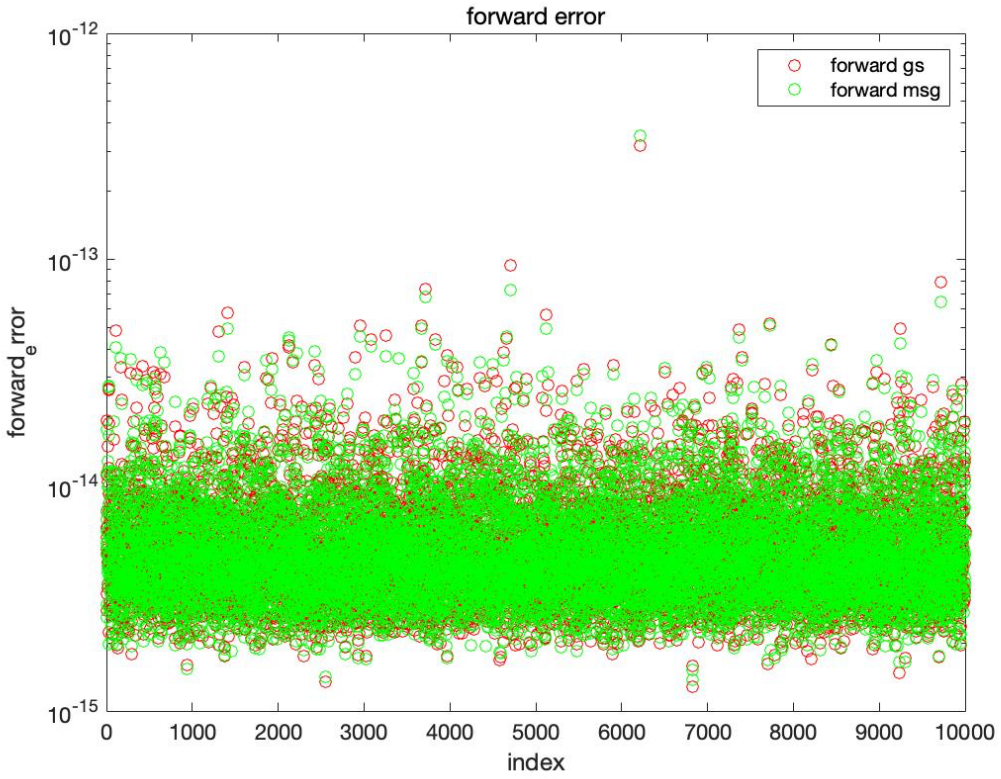


Observing the image, we can see that the R diagonal coefficients of the two algorithms decrease as the number of columns in the matrix A increases. Among them, the R diagonal coefficient of the GS algorithm is stable at eps, and the R diagonal coefficient of the MGS

algorithm is stable at $eps^{1/2}$. Therefore, the MGS algorithm has higher accuracy than GS.

Question 3:





Observing the image, it can be seen that the forward error coefficients of the two algorithms are roughly the same, but the backward error is quite different. The error of the GS algorithm is obviously higher than that of the MGS algorithm, indicating that the improved MGS algorithm has better results than the GS algorithm