

CS513, Spring 21

Prof. Ron

HW #2, Factor=.5

Due February 12, 2021

Copy from Canvas the file `sloppy_qr.m` (under Files/Matlab) into the directory where you run `Matlab`. The code in that file QR factors a matrix $A_{m \times n}$ ($m \geq n$) into $Q_{m \times m}R_{m \times n}$.

Assuming that A is square, you need to find the *complexity* of the algorithm used in that file for the QR factorization, i.e., the number of operations. For that, run the code on square matrices A of different sizes, and keep an operation count for each run (the number of operations of each line of code is listed as a comment in the `.m` file). Based on the experiment, determine the complexity in the form cn^k . (If you cannot do that, try at least to find the *order* of the algorithm i.e., determine the k in the $O(n^k)$ order of the algorithm. Take one of your test matrices to be of large order, say 100×100)