MACM 316 — Computing Assignment #2

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Values of N and N_{ex}

I knew that I was eventually going to take $log_{10}(N)$ to explore a potential power-law relationship between matrices of size N and flop counts involved in GE, so I chose to define $N = 10^k$, where $k = 1, 2, 3, 4$, to correspond nicely with log_{10} values. I chose not to include $N = 10^0$, since this is a trivial 1×1 matrix, which takes no operations to solve.

I started by defining `dense_Nex`, `tri_Nex`, and `perm_Nex` to be the number of solves for each type of matrix $[M_d], [M_t]$, and $[M_p]$, respectively. I fiddled around with each, until the time to solve each type of matrix `*_Nex` times was around 1 second.

	$N = 10$	$N = 100$	$N = 1,000$	$N = 3,163$
`dense_Nex`	3×10^5	3.5×10^4	3.5×10^4	
`avg_dense_time`	4×10^{-6}	1.68×10^{-4}	2.2472×10^{-2}	
`tri_Nex`	2×10^6	8×10^5	8×10^5	
`avg_tri_time`	1×10^{-6}	6×10^{-6}	4.84×10^{-3}	
`perm_Nex`	1.2×10^6	1.2×10^5	1.2×10^5	
`avg_perm_time`	1×10^{-6}	3.4×10^{-5}	4.550×10^{-3}	