Math 3620 Machine Problem 2: Due Tu. Jan. 21, 2020

1) Write a MATLAB script that that does the following:
   a) Inputs a file name and reads an $n \times n$ matrix A and an n-vector b.
   b) Calls on a MATLAB function `[x,B,p,q,ra] = gecp(A,b)` (see below) that performs Gaussian elimination with complete pivoting on the system $Ax = b$ to find the rank `ra` of A and a solution `x`, if A is of full rank.
   c) For each run of the script print `B,p,q,ra`.
   d) If A is of full rank, also print `x` and the max norm of the residual vector.
2) Write the function `[x,B,p,q,ra] = gecp(A,b`. The output `B` should be the matrix obtained in the elimination process. The vectors `p` and `q` should be permutation vectors describing the row and column swaps that were made. Finally `ra` should be the rank of A as determined by your function (NOT by a call on the `rank` function built into MATLAB.)
3) Run your code with the following data files which you can download from the web page:
   a) mp1.dat1
   b) mp1.dat2
   c) mp1.dat3
4) Turn in a complete listing of your code along with all of the requested output for the three runs.