MATH 566 – Homework #4

due 27 September 2007

1) Write Matlab code to perform the LU-factorization of an \( n \times n \) matrix \( \hat{A} \), where \( \hat{A} \) is derived from the nonsingular matrix \( A \) via the partial pivoting procedure discussed in class. As in the previous assignment, your code should overwrite the array that initially stored the matrix \( \hat{A} \) with the pertinent entries of the matrices \( L \) and \( U \).

Once you have \( L \) and \( U \) stored in this manner, use the LU-factorization to solve the equation
\[
Ax = b
\]
for \( p \) different vectors \( b \).

Your Matlab program should read the data from a file called \texttt{hw4.dat}. This data file must be organized in this order:

- the size \( n \) of the problem
- the number \( p \) described above
- the entries of matrix \( A \), one row at a time, starting with the top row
- each version of the vectors \( b \).

Email your computer code to me at \texttt{stephenbrill@yahoo.com}

2) Do the following exercises from the text:

- Exercise 1.8.1
- Exercise 1.8.7
- Exercise 2.1.10
- Exercise 2.1.11
- Exercise 2.1.13
- Exercise 2.1.17