Honors Linear Algebra (Spring 2011) — Homework 4

- DL-LAA stands for the text (David Lay – Linear Algebra and its Applications).
- Problems marked with **[M]** involve the use of MATLAB. You must submit the commands you use as well as all output from MATLAB as part of the answer to such a problem.

  You are welcome to email me these commands and output files. If you do email me, name the file(s) using your first and last names. For instance, if you are Eric Cartman and are sending me a text file, you could name it something like `MatlabHw4_Eric_Cartman.txt`.
- The points for each problem is given in parentheses. The total points add up to 75. You will be graded for 70 points, with the possibility of getting up to 5 points as extra credit.
- **This homework is due in class on Thursday, February 10**.

1. (6) DL-LAA Problem 22 from Page 55.
2. (12) `TRUE/FALSE`. DL-LAA Problem 23 **(d)** and 24 **(b), (c), (d)** from Page 56.
3. (6) DL-LAA Problem 28 from page 56.
4. (8) DL-LAA Problem 36 from page 56.
5. (8) DL-LAA Problem 10 from page 71.
6. (17) **[M]** Reduce the following matrix to reduced echelon form by performing the necessary EROs in MATLAB. Show *all* commands you use to perform the EROs, and show all output from MATLAB. You can**not** just use `rref` here – you could of course check you answer using `rref` after you do the EROs yourselves, though.

$$A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 11 & 8 & 12 & 10 & 13 \\ 15 & 14 & 13 & 12 & 11 \\ -2 & -3 & -4 & -5 & -6 \end{bmatrix}$$

7. (18) **[M]** DL-LAA Problem 12 from Page 64. You can use MATLAB to find the reduced echelon form of the augmented matrix.

   Hint: You need to write a "balance" equation for each junction, or node, in the traffic network shown, in the form "inflow = outflow". For instance, the equation for Junction B would be $200 = x_1 + x_2$.