**STAT 445/645 Assignment #2**

**Due at 4:30 pm on Friday, January 24.**

* Page 103:
* Problem 2.1 parts (a) and (b), omitting (b) (iii).
* Problem 2.3 part (d) only. *This question will not be graded*.
* Problem 2.5.
* Problem 2.6, part (a) only.
* Page 106: Problem 2.27, part (a) only.
* Page 109: Problem 2.41.
* Additional Problem A7:

1. Let ***x*** = (-3, 7)’ and ***w*** = (5, -4)’.
   1. Evaluate the dot product of these vectors.
   2. Are they orthogonal?
2. Let ***z*** = (-3, 4, 1)’ and ***w*** = (-4, 6, -3)’.
   1. Find the lengths of each of these vectors.
   2. Find the angle between them.
3. Is the following matrix orthogonal – or at least approximately, subject to potential round-off errors?
4. Let ***u*** = (4,3)’ and ***v*** = (-6, 8)’.
5. What is the angle between ***u*** and ***v***?
6. What is the angle between ***u*** and the *x*1-axis?
7. How long is each of ***u*** and ***v***?
8. Multiply each of ***u*** and ***v*** by a scalar so as to make them of unit length.
9. Plot them along with the vector, ***x*** = (-2,2).
10. Find the coordinates of ***x*** with respect to the axes that line up with the unit vectors calculated in part (d).
11. Find the matrix that converts the coordinates of any vector to coordinates with respect to this new pair of axes.