# 1016-345-01
# Probability and Statistics for Engineers

Problem Set 6

Assigned 2011 January 25
Due 2011 February 1

**Show your work on all problems! If you use a computer to assist with numerical computations, turn in your source code as well.**

## 1 Devore Chapter 4, Problem 88

## 2 Devore Chapter 5, Problem 12

## 3 Devore Chapter 5, Problem 22

## 4 Devore Chapter 5, Problem 30

## 5 Computational Exercise (Extra Credit)

Download the two data sets for this problem from
`http://ccrg.rit.edu/~whelan/courses/2010_4wi_1016_345/data/ps06_prob5_set1.dat`
and
`http://ccrg.rit.edu/~whelan/courses/2010_4wi_1016_345/data/ps06_prob5_set2.dat`
using the credentials given in class.

For each dataset, construct a normal probability plot by sorting the data into ascending order and plotting $z_{1-(i-.5)/n}$ vs $x_i$, where $n$ is the number of points in the dataset, $i = 1 \ldots n$, $x_i$ is the $i$th datapoint in the sorted set, and $z_\alpha$ is defined as usual by $\Phi(z_\alpha) = 1 - \alpha$. You may find it useful to construct a function which uses the inverse error function to calculate $z_\alpha$ for a given $\alpha$; e.g., in scipy/matplotlib, you can use

```
from scipy.special import erfinv
def zscore(Phi):
    return np.sqrt(2) * erfinv( 2.0 * Phi - 1.0 )
```