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

Note that problem 4.88 is different in the seventh and eighth editions of Devore. Be sure to do the problem from the eighth edition.

Also: Verify that the given $z$ percentile values are correct to two decimal places by looking up their $\Phi$ values and comparing them to the required percentiles for a sample of size 15.

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/2012_3fa_1016_345/data/ps06_prob5_set1.dat

and

http://ccrg.rit.edu/~whelan/courses/2012_3fa_1016_345/data/ps06_prob5_set2.dat

using username bayes, password normal

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 )