

1016-351-01

Probability

Problem Set 6

Assigned 2012 January 31
Due 2012 February 7

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 60
- 2 Devore Chapter 4, Problem 66
- 3 Devore Chapter 4, Problem 71
- 4 Devore Chapter 4, Problem 80

Note that the parameters of the lognormal distribution in Problem 79 are given in the back of the book as $\mu = 9.164$ and $\sigma = .385$.

5 Computational Exercise (Extra Credit)

Download the two data sets for this problem from

http://ccrg.rit.edu/~whelan/courses/2011_4wi_1016_351/data/ps06_prob5_set1.dat
and

http://ccrg.rit.edu/~whelan/courses/2011_4wi_1016_351/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, $i = 1 \dots n$, x_i is the i th datapoint in the sorted set, and z_α is defined as usual by $\Phi(z_\alpha) = 1 - \alpha$. You may find it useful to construct a function which uses the inverse of $\Phi(z)$ to calculate z_α for a given α ; e.g., in `scipy/matplotlib`, you can use

```
from scipy.special import ndtri
def zalpha(alpha):
    return ndtri(1-alpha)
```