Statistics 110 – Assignment 2

Due: Tuesday, July 11, 2006

1. Rice 2.13
2. Rice 2.14
3. Rice 2.20
4. Rice 2.46
5. Rice 2.53
6. If $X \sim N(\mu, \sigma^2)$, find the value of c in terms of σ such that $P[\mu - c \leq X \leq \mu + c] = 0.2$
7. Assume that a random variable X has a density of the form

$$f(x) = \begin{cases} \frac{c}{x^{\alpha+1}} & \text{if } x \geq 1 \\ 0 & \text{if } x < 1 \end{cases}$$

   (a) What value of c makes this a valid density? (Note c depends on α.)

   (b) What values of α make this a valid density?

   (c) Find the median and lower and upper quartiles of this random variable.

8. Rice 4.4 (Hint: this relates to the previous question)
9. Rice 4.6 (Note in b, that should be find the probability density function, not mass function)
10. Rice 4.10
11. Let X be a discrete random variable taking on values 1, 2, 3, and 4 with probabilities $\frac{1}{3}, \frac{1}{6}, \frac{1}{12}$, and p respectively.

    (a) What value of p makes this a valid probability mass function?

    (b) Find $E[X]$.

    (c) Find $\text{Var}(X)$.

Suggested additional problems from Rice (don't hand in)

2.11, 2.21, 2.30 (assume that a month is exactly 4 weeks long), 2.31, 2.36, 2.45, 4.9, 4.21