Stat 400, HW 13

You will either be tested on one of these problems or will hand in the entire assignment on Monday, December 5.

Problems from the text

§7.3, # 32, 37 (a),(b), 40 (c).

1. To do 40(c) use the MINITAB output from §7.2, # 17.

2. To do 40 (c) and 37 (a),(b) you need to extract $\overline{x}$ and s from the corresponding MINITAB outputs. Here is how it works for # 37 (a),(b).

(i) $\overline{x}$ = Mean = 0.9255

(ii) s = StDev = .0809

(iii) $\frac{s}{\sqrt{n}}$ = SEMean = .0181

Extra Problem

Let $X_1, X_2, \cdots, X_n$ be a random sample from a normal distribution with mean μ and variance σ^2. Prove that the random interval

$$(-\infty, \overline{X} + t_{\alpha,n-1}\sqrt{\frac{n+1}{n}}S)$$

is a $100(1-\alpha)\%$ prediction interval for the next observation X_{n+1}.

You may assume the theorem that $T = \frac{\overline{X}-X_{n+1}}{\sqrt{\frac{n+1}{n}}S}$ has
t distribution with $n-1$ degrees of freedom.