

Assignment #6 — Due Friday, October 28 by 4:00 P.M.

Turn in homework to your TA's mailbox using this sheet as the cover page.

Fill in your name and also circle the *lecture section in which you are registered* and circle the *discussion section you expect to attend* to pick up this assignment.

Name:

Lecture 1 (Hanlon). **311:** Tu 1:00 - 2:15pm **312:** Th 8:00 - 9:15am **313:** We 1:00 - 2:15pm

Lecture 2 (Larget). **321:** Tu 1:00 - 2:15pm **322:** We 2:30 - 3:45pm **323:** We 1:00 - 2:15pm

Please answer the following questions.

- Let $Z \sim N(0, 1)$. Answer the following questions using *both* the normal table and software (such as R).
 - Compute $P(Z \leq 0.75)$.
 - Compute $P(Z \geq -0.97)$.
 - Compute $P(-1.18 \leq Z \leq -1.11)$.
 - $P(Z > z) = 0.05$. Find z .
 - $P(Z < z) = 0.10$. Find z .
 - $P(-z < Z < z) = 0.7$. Find z .
 - Let $t(x)$ denote a t random variable with x degrees of freedom. Answer the following questions using *both* the t table and software (such as R).
 - Let $T \sim t(10)$. Compute $P(T \leq 0.75)$.
 - Let $T \sim t(13)$. Compute $P(T \geq -0.97)$.
 - Let $T \sim t(19)$. Compute $P(-1.18 \leq T \leq -1.11)$.
 - Let $T \sim t(11)$. $P(T > z) = 0.05$. Find z .
 - Let $T \sim t(15)$. $P(T < z) = 0.10$. Find z .
 - Let $T \sim t(17)$. $P(-z < T < z) = 0.7$. Find z .
 - The total nitrogen concentration of the blood plasma of healthy 40 day old albino rats is normally distributed with mean 1.25 g/100ml and standard deviation 0.0080 g/100ml. Let \bar{X} represent the mean nitrogen concentration level of 25 rats randomly chosen from this population.
 - If a healthy 40 day old albino rat is chosen at random, what is the probability that the total nitrogen concentration of its blood plasma will be between 1.26 g/100ml and 1.30 g/100ml?
 - What is the value of nitrogen concentration such that 65% of 40 day old albino rats have a nitrogen concentration higher than that value?
 - Compute $P(1.24 \leq \bar{X} \leq 1.26)$
 - Compute the 0.90 quantile of the sampling distribution of \bar{X} .
 - Compute the cutoff values for the middle 80% of the sampling distribution of \bar{X} .
 - Textbook p.254, Problem 16
 - Textbook p.254, Problem 17
 - Textbook p.255, Problem 20
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