HW 11 is due on Friday, Nov. 8. Quiz 9 is on chapters 17 and 18. Especially the t-test, t-interval, matched pairs test and interval and 2 sample t test and intervals.

A) Modified 18.13 A study of self concept of 7th grade students asked if female (X_1) and male (X_2) differ in mean self concept *score.* Use the output to do a 4 step test.

Gender	n	Mean	Std Dev	Std Err	t	df	p
F	31	55.5161	12.6961	2.2803	-0.8276	62.8	0.4110
M	47	57.9149	12.2649	1.7890			

B) Let μ_1 and μ_2 be the mean depression scores for males and females respectively. Using the table below, find a 95% confidence interval for the difference in means.

group	n	$\overline{x}$	s
Males	112	7.38	6.95
Females	104	7.15	6.31

comment: See p. 476 and ex. 18.4 on p. 478.

C) 19.1 A study of religious practices among college students interviewed a sample of 127 students: 107 of the students said they prayed at least once in a while. a) Describe the population and explain in words what the parameter p is. b) Compute $\hat{p}$.
comment: See p. 502-503.

D) A study interviewed a SRS of 14941 college students. Suppose that half of all college students "drink to get drunk" at least once in a while. That is $p = 0.5$. a) What are the mean and standard deviation of the proportion $\hat{p}$ of the sample who drink to get drunk? b) Use the normal approximation to find the probability that $\hat{p}$ is between 0.49 and 0.51. comment: See p. 502 and notes. Forwards calculation in b) is about 0.99.

E) A television news program conducts a call-in poll about a proposed city ban on handgun ownership. Of the 2372 calls, 1921 oppose the ban. We can't use these data as the basis for inference about the proportion of all of the city's citizens who oppose the ban. Why not? comment: What kind of bad sample is this?

F) 19.4 In an AIDS survey of 2673 adult heterosexuals, $\hat{p} = 0.002$ had both received a blood transfusion and had a sexual partner from a group at high risk of AIDS. Explain why we can't use a large sample confidence interval to estimate the proportion p of the population who share these two risk factors. comment: By p. 505, need both $n(\hat{p}) \geq 15$ and $n(1 - \hat{p}) \geq 15$. Show $n(\hat{p}) < 15$.

G) In a SRS of 1048 13-to-17 year olds, 692 had a television in their room.
a) Check that the large sample confidence interval can be used.
b) Give a 95% CI for the proportion of all teens that have a TV in their room. comment for G: See p. 505 and ex. 19.4. comment for H) See p. 511 and use p* = 0.75.

H) 19.11 PTC is a substance that has a strong bitter taste for some people and is tasteless for others. About 75% of Italians can taste PTC and the ability to taste PTC is inherited. You want to estimate the proportion of Americans with at least one Italian grandparent who can taste PTC. How large a sample must you test in order to estimate the proportion who can taste PTC within ± 0.04 with 90% confidence?

I) In a SRS of 1048 13-to-17 year olds, 692 had a television in their room. Do a 4 step test for whether the data provide good evidence that more than half of all teens have a

TV in their room. comment: See p. 513 - 514, $t_o \approx 10.4$, pval $= 0$.

J) A study obtained random samples of 56 black women and 63 black men over the age of 65 from Atlantic City. Of the women, 27 said they "felt vulnerable" to crime while 46 of the men said this.

a) What proportion of women ($\hat{p}_2$) feel vulnerable? Of men ($\hat{p}_1$) ?

b) Give a 95% CI for the difference (men minus women). comment: See p. 526.

K) 20.32b The data below is for random samples of drivers and seat belt use around 2000. Do a 4 step test for whether the proportion of drivers in New York who wear seatbelts (p_1) is higher than the Boston proportion (p_2).

City	drivers	belted
New York	220	183
Boston	117	68

comment: See p. 532-533, $z_0 \approx 5$ and pval $= 0.0$.

L) Minitab output. Two Sample T-Test and Confidence Interval

Two sample T for DAgeF vs DAgeM

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          N      Mean     StDev    SE Mean
DAgeF  19      75.5      13.2       3.0
DAgeM  18      74.2      13.2       3.1
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95% CI for mu DAgeF - mu DAgeM: (-7.5, 10.1)
T-Test mu DAgeF = mu DAgeM (vs not =): T = 0.30 P = 0.77 DF = 34
Do a 4 step test for whether wealthy mean female and male death ages differ.

M) Minitab problem. Test and Confidence Interval for One Proportion

Test of p = 0.6 vs p < 0.6
Success = 1

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Variable          X     N  Sample p        95.0 % CI       Z-Value  P-Value
lostind         154   279  0.551971  (0.493619, 0.610324)    -1.64    0.051
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Federal guidelines suggest that less than 60% of patients with lower back pain need lose work days. A SRS of 279 patients from a large HMO was taken. 154 lost at least one day of work. Test whether the HMO has met federal guidelines with the printed output. Use a 4 step test.