Stat 2470, Quiz #13, Spring 2014 Name KEY

Instructions: Show all work. You may use your calculator rather than compute formulas by hand, but if you do, 'show work' by saying which program you used to obtain the result and what information you entered. Round measures of center to one decimal place more than the data, and variance/standard deviation to two decimal places more than the original data. Round probabilities to three decimal places (or percent plus one decimal place).

1. Consider the information in the table and use it to answer the questions below.

Age	Sample Size	Sample Mean (in.)	Std. Error Mean
20-39	866	64.9	0.09
60+	934	63.1	0.11

a. Calculate a 95% confidence interval for the heights of women in each group? Does your answer suggest that the two groups have different average heights?

$\sigma_\epsilon = \sigma/\sqrt{n}$ $\sigma_1 \Rightarrow 2.65$ $\sigma_2 \Rightarrow 3.36$

$64.9 \pm 1.96 * .09 \Rightarrow$ (64.72, 65.08)

$63.1 \pm 1.96 * .11$ (62.88, 63.32)

no overlap diff. in height is prob real

b. Carry out a test for significance for $\mu_1 - \mu_2 > 1$ where (1) refers to the younger group and (2) refers to the older group. Is there sufficient evidence to conclude that the younger group is more than an inch taller than the older group?

2 Samp t test

$\bar{x}_1 = 64.9$ $s_{x1} = 2.65$ $n_1 = 866$

$\bar{x}_2 = 64.1$ (63.1+1) $s_{x_2} = 3.36$ $n_2 = 934$

$\mu_1 > \mu_2 + 1$

No pooled

$p = 1.05E-8 \Rightarrow < .105 = \alpha$ reject H_0

(z-test gives similar result)

μ_2 is more than an inch shorter than μ_1

2. Suppose that instead of hundreds of people in the test group, we had taken a sample of only 15 from each age group. Assuming all other features are the same, calculate the test for $\mu_1 - \mu_2 > 0$ using a t test.

Same but change $n_1 = 15$ $n_2 = 15$

$p = .23768$

now, fail to reject the null

$\sigma_1 = .349$ $\sigma_2 = .426$ $p = 2.864E-6$ reject H_0