

S12 - 3.6 - Hyp Testing Notes

Alternative is the Claim.
Null: Nothing Changed.
Fail/Reject is about H_0

Claim: Average male height is NOT 160 cm? Gov' says $\mu = 160$. 100 males $\bar{x} = 162cm$. $s = 8cm$. 95% CL.

Null Hypothesis H_0 : Average male height is 160 cm

Alternate Hypothesis H_a : Average male height > or < 160 cm

$n = 100$ males
 $\mu = 162cm$
 $\sigma = 8cm$

95% Confidence Level
Significance Level

$\alpha = 0.05$

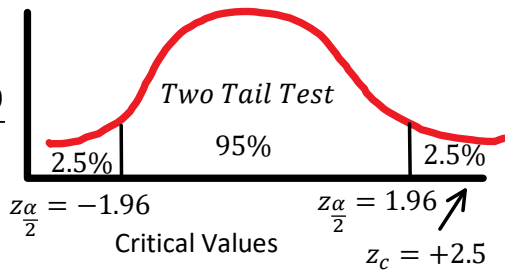
$z_{\alpha/2} = \pm 1.96$

$n > 30$

$$z_c = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$$

$$z_c = \frac{162 - 160}{\frac{8}{\sqrt{100}}}$$

$z_c = 2.5$



Reject H_0 : There is sufficient evidence average male height is NOT 160cm at a 95% confidence level.

In a random sample 200 out of 1000 failed to finish university in under 4 years. (Finished in over 4 years/or did not finish*) Claim: Less than 25% finish in university under 4 years. 99% CL.

Null Hypothesis $H_0: p = 0.25$ or $H_0: p \geq 0.25$

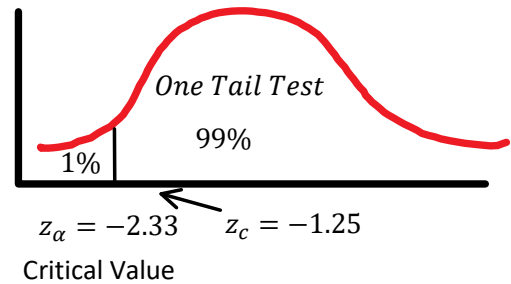
Alternative Hypothesis $H_A: p < 0.25$

99% CL
SL $\alpha = 0.01$
 $\bar{p} = \frac{200}{1000} = 0.2$
 $q = 1 - p = 1 - 0.2 = 0.8$

$$z_c = \frac{\bar{p} - p}{\sqrt{\frac{pq}{n}}}$$

$$z_c = \frac{0.2 - 0.25}{\sqrt{\frac{0.2(0.8)}{1000}}}$$

$z_c = -1.25$



Fail to Reject H_0 : There is NOT sufficient evidence support the claim that 25% (Or More) of students fail to finish university in under 4 years at a 99% confidence level.

Claim: Average male height is more than 160 cm? Gov' says $\mu = 160$. 25 males $\bar{x} = 162cm$. $s = 8cm$. 90% CL.

Null Hypothesis H_0 : Average male height is less than 160 cm.

Alternate Hypothesis H_a : Average male height > 160 cm

$n = 25$ males
 $\bar{x} = 162cm$
 $s = 8cm$

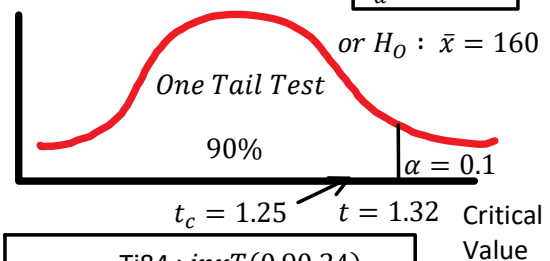
90% CL
SL $\alpha = 0.1$

$df = n - 1 = 24$

$$t_c = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}}$$

$$t_c = \frac{162 - 160}{\frac{8}{\sqrt{25}}}$$

$t_c = 1.25$

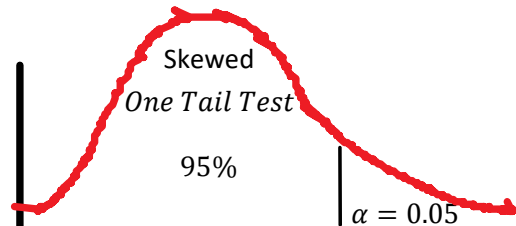


Fail to Reject H_0 : There is NOT sufficient evidence average male height is less than 160cm at a 90% CL.

Ti84 : invT(0.90,24)
 $t_c = 1.31$ 2nd Distr/Vars 4

A principle expect students are absent equally in a five day school week. 100 teachers results below. 5% SL.

Absences	Mon	Tue	Wed	Thu	Fri	Sum
Observed	23	16	14	19	28	
Expected	20	20	20	20	20	
$(O - E)^2$	9	16	36	1	64	126



H_0 : Equal Frequencies
 H_a : Unqual Frequencies

$$X_c^2 = \frac{\sum(O - E)^2}{E}$$

$X_c^2 = \frac{126}{20} = 6.3$

$df = n - 1 = 4$
 $\alpha = 0.05$

Fail to Reject H_0 : There is NOT sufficient evidence there are equal frequencies in attendance at a 95% CL.

$X_c^2 = 6.3$ $X^2 = 9.488$
Critical Value