

# Statistics

## Lecture 26



Feb 19-8:47 AM

School claims that 80% of all students are active in Social Media.  $P = .8$   $H_0$

I surveyed 175 students and 84% of them were active in Social Media.  $n = 175$   
 $\hat{p} = .84 \rightarrow \chi = n\hat{p} = 175(.84) = 147$

No  $\alpha \rightarrow .05$   
 Test the claim.

$H_0: P = .8$  claim  
 $H_1: P \neq .8$  TTT

CTS  $z = 1.323$   
 P-value  $P = .186$

1-Prop Z Test  
 $P_0 = .8$   $H_0$   
 $\chi = 147$   
 $n = 175$   
 Prop  $\neq P_0$   $H_1$

P-value  $> \alpha$   
 $.186 > .05$   
 $H_0$  valid  $\hat{=}$   $H_1$  invalid  
 Valid claim  
**FTR the claim**

Jun 3-9:56 AM

LA Times claims the mean min. wage in LA county is at least \$22/hr.  $\mu \geq 22$   
 $\uparrow H_0$

I surveyed  $n=35$  jobs in LA county that the mean min. wage was \$20/hr.  $\bar{x}=20$

It is known that standard deviation of all min. wage is \$4.  $\sigma=4$   
 use  $\alpha=.1$  to test the claim.

$H_0: \mu \geq 22$  claim  $\sigma$  known  $\rightarrow$  Case I

$H_1: \mu < 22$  LTT Z-Test  
 inpt: Stats

CTS  $Z = -2.958$   
 P-Value  $P = .002$

$\mu_0: 22$   $H_0$   
 $\sigma: 4$   
 $\bar{x}: 20$   
 $n: 35$   
 $\mu < \mu_0$   $H_1$

P-Value  $< \alpha$   
 $.002 < .1$

$H_0$  invalid &  $H_1$  valid

Invalid claim **Reject the claim**

Jun 3-10:08 AM

CNN claims that the mean age of all voters in CA last night is more than 45 yrs.  
 $\mu > 45$   
 $\uparrow H_1$

I took a sample of  $n=20$  voters, the mean age was 48 yrs with standard dev. of 10 years.  
 $\bar{x}=48$   $s=10$

test the claim at  $\alpha=.02$ .

$H_0: \mu \leq 45$   $\sigma$  unknown  $\rightarrow$  Case II

$H_1: \mu > 45$  claim, RTT T-Test  
 inpt: Stats

CTS  $t = 1.342$   
 P-Value  $P = .098$

$\mu_0: 45$   
 $\bar{x} = 48$   
 $s = 10$   
 $n = 20$   
 $\mu > \mu_0$   $H_1$

P-Value  $> \alpha$   
 $.098 > .02$

$H_0$  valid,  $H_1$  invalid

Invalid claim  $\rightarrow$  **Reject the claim**

If we choose  $\alpha=.1$ ,

P-Value  $\leq \alpha$  therefore  $H_0$  invalid &  $H_1$  valid  
 $.098 < .1$  valid claim  $\rightarrow$  FTR

Jun 3-10:24 AM

I randomly Selected 10 exams.  
 Here are the Scores: find

85	72	90	95	68	1) $\bar{x} = 84.3 \approx 84$	}	Round to whole #
100	80	75	90	88	2) $S = 10.339 \approx 10$		

3)  $S^2 = \frac{1069}{10}$  } Reduced Fraction

4) Find Conf. interval for the mean of all exams.  
 NO  $\sigma$  level  $\rightarrow .95$   
 NO  $\sigma \rightarrow$  T Interval

$77 < \mu < 91$

$E = \frac{91 - 77}{2} = 7$

Jun 3-10:39 AM

5) Test the claim that the mean of all exams is 80.  $\rightarrow$  NO  $\alpha \rightarrow .05$

$H_0: \mu = 80$  claim  $\sigma$  unknown Case II

$H_1: \mu \neq 80$  TTT T-Test

CTS  $t = 1.265$   
 P-value  $P = .238$

P-Value  $>$   $\alpha$

$H_0$  valid  $H_1$  invalid  
 valid claim

FTR the claim

Jun 3-10:46 AM