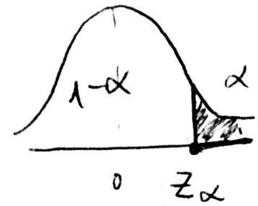
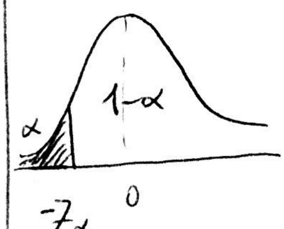
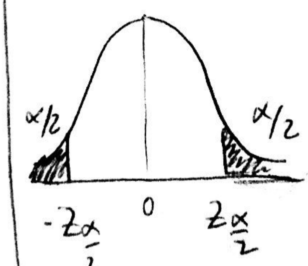
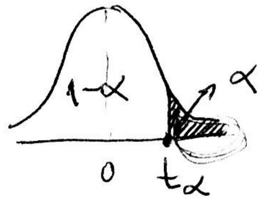
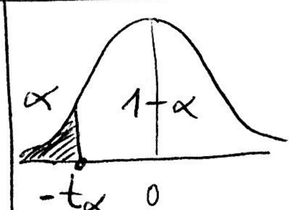
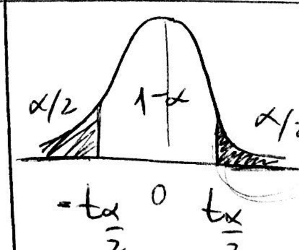
<u>Summary</u>: hypothesis testing for a proportion : p.

follow 8 steps.

steps 1-3	step 4	step 5	step 6	step 7	step 8.
$H_0: p = p_0$ $H_1: p > p_0$	CHOOSE α 0.01 0.05 0.1	$z^{stat} = \dfrac{\hat{p} - p_0}{\sqrt{\dfrac{p_0(1-p_0)}{n}}}$ Under the assumption that the Ho is true it follows the standard normal distribution.	 p-value = $P(Z > z^{stat})$	reject Ho $z^{stat} > z_\alpha$ or p-value < α	non technical interpretation of step 7.
$H_0: p = p_0$ $H_1: p < p_0$			 p-value = $P(Z < z^{stat})$	reject Ho $z^{stat} < -z_\alpha$ or p-value < α	
$H_0: p = p_0$ $H_1: p \neq p_0$			 p-value = $2P(Z > z^{stat})$ if $z^{stat} > 0$ p-value = $P(Z < z^{stat})$ if $z^{stat} < 0$.	reject Ho $z^{stat} > z_{\frac{\alpha}{2}}$ or $z^{stat} < -z_{\frac{\alpha}{2}}$ or p-value < α.	

Test of hypothesis for the mean : μ.
follow 8 steps.

steps 1-3	step 4	step 5	step 6	step 7	step 8
$H_0: \mu = \mu_0$ $H_1: \mu > \mu_0$	choose α.	$t^{stat} = \dfrac{\bar{X} - \mu_0}{s/\sqrt{n}}$ under the assumption that Ho is true it follows	 p-value = $P(t > t^{stat})$	reject Ho $t^{stat} > t_\alpha$ or p-value $< \alpha$.	make non technical interpretation of step 7
$H_0: \mu = \mu_0$ $H_1: \mu < \mu_0$		the student t distribution with $(n-1)$ degrees of freedom.	 p-value = $P(t < t^{stat})$	reject Ho $t^{stat} < -t_\alpha$ or p-value $< \alpha$.	
$H_0: \mu = \mu_0$ $H_1: \mu \neq \mu_0$			 p-value = $2P(t > t^{stat})$ if $t^{stat} > 0$ p-value = $2P(t < t^{stat})$ if $t^{stat} < 0$.	reject Ho $t^{stat} > t_{\alpha/2}$ or $t^{stat} < -t_{\frac{\alpha}{2}}$ or p-value $< \alpha$	

Slide 7.

step 1: "the mean amount of sleep for adults is less than 7 hours".

$\mu < 7$

step 2: $\mu \geq 7$.

step 3: $H_0: \mu = 7$ $\qquad H_1: \mu < 7$

step 4: level of significance is 0.05. $\alpha = 0.05$ $\qquad$ 2.201.

$\alpha = P(\text{reject } H_0 \text{ when the } H_0 \text{ is true})$

step 5: $t^{stat} = \dfrac{\bar{X} - \mu_0}{S/\sqrt{n}} = \dfrac{6.83 - 7}{1.99/\sqrt{12}} = -0.2959.$

t^{stat} has a student t distribution with $(n-1) = 11$ degrees of freedom.

step 6. critical ~~value~~ value is

11 degrees of freedom.

$-t_\alpha = -1.796$

-1.796

software

$p\text{-value} = P(t < -0.2959) = 0.3864$

step 7: based on critical value we fail to reject the H_0. (because $t^{stat} = -0.2959 > -1.796 = -t_\alpha$).

step 8: There is not enough evidence to support the claim that the mean amount of sleep for adults is less than 7 hours.