Section 8.1: Cont'd

Thursday, March 15, 2018 12:27 PM

Same scenario as before:

Six earthquakes whose duration is:
$\bar{x} = 1.15$ minutes
$s = 0.308$ minutes
assume the duration is normally distributed

An expert claims that the duration of Southern California earthquakes is 0.8 minutes. Your sample mean is higher, but is it significantly higher? Use a test of hypothesis.

$H_0: \quad \mu = 0.8$

$H_a: \quad \mu > 0.8$

← note: one-tailed because looking at increase

test statistic:

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$$

$$= \frac{1.15 - 0.8}{0.308/\sqrt{6}}$$

$$= 2.78351 \quad \text{with} \quad df = 5$$

now, can't look up exact value of p for this value of t, so instead do this:

df	$t_{0.025}$	$t_{0.01}$
5	2.571	3.365

↑ our t is about here

so if our t has $2.571 < t < 3.365$

$t_{0.025} < t < t_{0.01}$

so our probability p has $0.025 > p > 0.01$

from the significance chart, this is a significant increase

conclusion: The sample mean is significantly higher than the experts' claim.