Section 8: cont'd

Monday, April 10, 2017 1:01 PM

(10) breaking strength of rope → normally distributed

8 ropes

$\bar{x} = 62.1$ lbs

$s_D = 2.5$ lbs

want 90% LCB for mean breaking strength of this brand of rope

small sample size → t dist

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

α because it's a one-sided confidence interval

want 90% LCB

$1-\alpha$ so $\alpha = 0.1$ with $df = n-1 = 7$

$$t_\alpha = t_{0.1} = 1.415$$

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

$$= 62.1 - 1.415\left(\frac{2.5}{\sqrt{8}}\right)$$

$= 60.8$ lbs

Summary: confidence intervals

	Confidence interval	LCB or UCB
large sample $n \geq 30$	$z_{\alpha/2}$ normal	z_α
small sample $n < 30$	$t_{\alpha/2}$ t-table	t_α