Amanda Chapin

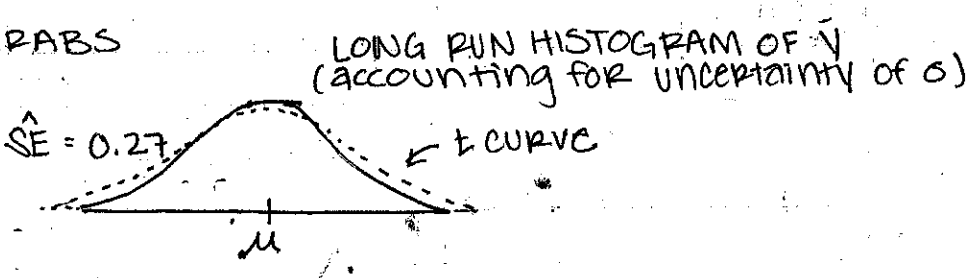
AMS 7 10/27/09

INTERVAL ESTIMATION

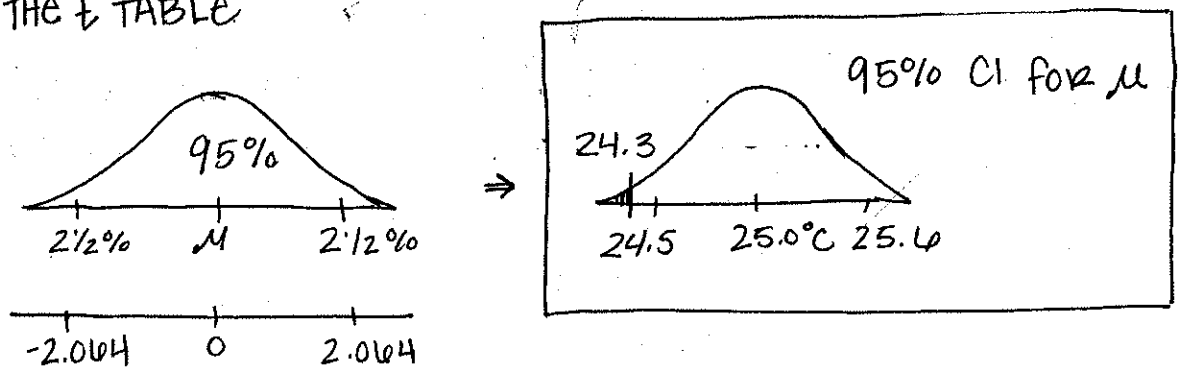
LAB#3 DUE MON, NOV 2
JW office now BE 308
MIDTERM DUE TH, OCT 29
All office hours start at Baskin white boards

L-139 INTERTIDAL CRABS

L-142



THE t TABLE



- $\bar{Y} \pm 2.064\ \hat{SE}(\bar{Y})$ = 95% confidence interval (CI) for μ

- since μ is not in 95% CI, the data does not support the theory at that confidence level

L-147

JMP → MOMENTS : $\hat{SE}(\bar{Y})$ & CI (95%) provided

L-153 when μ_0 is not in 95% interval, people say difference is STATISTICALLY SIGNIFICANT → LARGE IN STAT TERMS

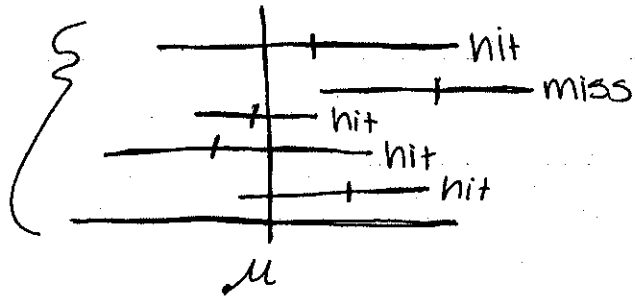
Q: What is PRACTICALLY SIGNIFICANT

The difference between 24.3 & 25 is large enough to ignore errors in simple random sampling.

AC

L-156

About 95% hits from sampling the population

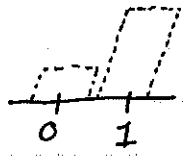


POP All Rats of Spp.	SAMPLE observed Rats	IMAGINARY possible $\hat{p}$

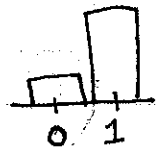
Left?

$N = \text{big}$ [1's, ⋮, 0's] $\xrightarrow[\text{IID}]{\text{like samples}}$ Left? [1's, 0's] $n = 12$ → [83%, 75%, ⋮] $M = \infty$

mean $\mu = p = ?$
SD $\sigma = ?$



mean $= \bar{y} = \hat{p} = \frac{10}{12} = 83\%$



① long run mean = EV of $\hat{p} = p$
② long run SD = SE of $\hat{p}$

INFERENTIAL SUMMARY

unknown (pop) quantity of main intrest	p = pop proportion of rats that would turn left
est. of the p	$\hat{p} = 83\%$
+/- por $\hat{p}$ of est. of μ	$\hat{SE}(\hat{p}) = \sqrt{\frac{(0.83)(0.17)}{12}} = 11\%$
95% CI for p	

① EV of $\hat{p}$ = $EV_{IID}(\hat{p}) = EV_{IID}(\bar{y}) = \mu = p$: $\boxed{E_{IID}(\hat{p}) = p}$
② SE of $\hat{p}$ = $SE_{IID}(\hat{p}) = SE_{IID}(\bar{y}) = \frac{\sigma}{\sqrt{n}} =$

MATH FACT (REMINDER) if pop has only 2 values, σ
$\sigma = [(\text{larger value}) - (\text{smaller value})] \cdot \sqrt{(\text{prop large})(\text{prop small})}$

AC

$\sigma = (1-0)\sqrt{p(1-p)}$

[Formula sheet]

NEW MATH FACT: with 0-1 pop. $\sigma = \sqrt{p(1-p)}$

$\Rightarrow SE_{IID}(\hat{p}) = \frac{\sigma}{\sqrt{n}} = \frac{\sqrt{\hat{p}(1-\hat{p})}}{\sqrt{n}} = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$