11/1/18
Wave
Moretto

Lecture #11: Statistical Models

long-run hist of $\bar{y}$ $(n=4)$

$P(\bar{y} < 3.6) = ?$

long run mean EV of $\bar{y} = 3.8 = \mu$

- standard error (SE) of $\bar{y}$ = SE of $\bar{y} = \frac{\sigma}{\sqrt{n}}$ ⊛

long run SD SE of $\bar{y}$

$SE_{IID}(\bar{y}) = \frac{\sigma}{\sqrt{n}}$ $= 0.1 = \frac{\sigma}{\sqrt{n}}$

↑ uncertainty in using $\bar{y}$ to estimate μ = noise level of $\bar{y}$

← will use rest of quarter!

in SE formula?

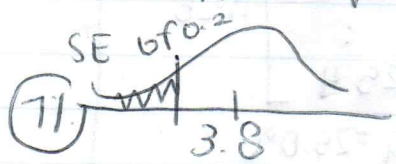
N	X
μ	X
σ	↑ σ ↑ $SE(\bar{y})$ ↑
M	↑ $\sqrt{n}$ ↑ $SE(\bar{y})$ ↓
n	X

$SE(\bar{y})$ ↓ with n

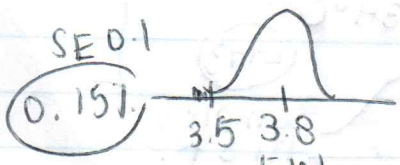
↑ our uncertainty about μ

⊛ = square root law: to cut $SE(\bar{y})$ in half, you have to quadruple n (multiply by 4)

- $SE(\bar{y}) = \frac{\sigma}{\sqrt{n}} = \frac{0.2}{\sqrt{4}} = 0.1$



hist of $(n=1)$ $\bar{y}$



hist of $(n=4)$ $\bar{y}$ Lg CLT p. L-124

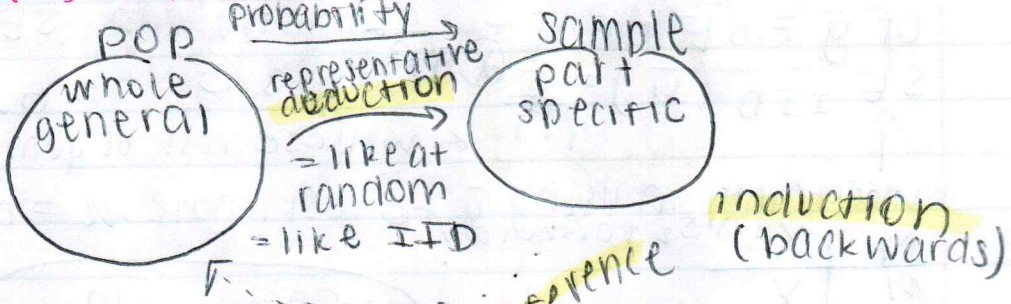
$\frac{3.5 - 3.8}{0.1} = -3$

n	P(misclassification)	cost
1	71.	$25
4	0.151. ↑ benefit	$100 ↑ cost

- Downside misclassification: eat a few bananas that you didn't need to eat
- Just like problem 4 on takehome midterm

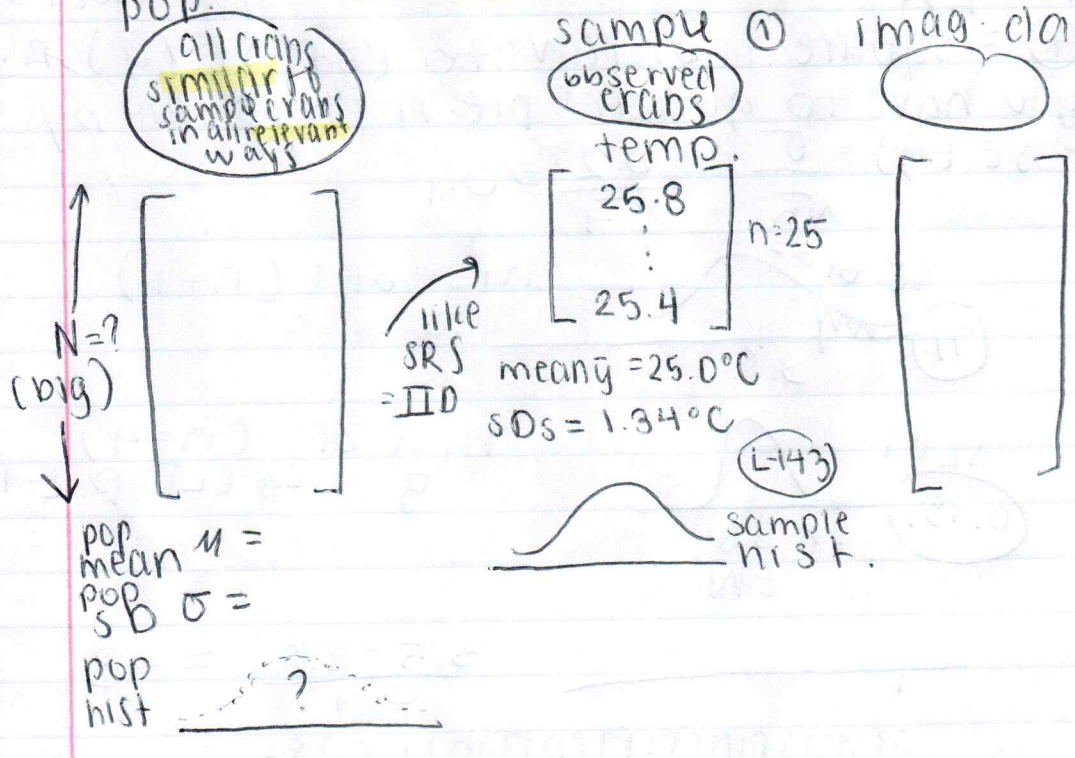
not on take-home midterm)

Statistical Inference



- Easier to go pop → sample than sample → pop

Statistical Inference Model



- pop. represents broadest scope of valid generalizability outward from the sample

inferential summary

pop	unknown pop. quantity of main interest	μ = pop. mean equil. temp.
sample	estimate of μ	$\bar{y} = 25.0\,^{\circ}C$

imag claim