May 15, 2017

This time: confidence intervals for means & ~~pop~~ proportions

Next time:

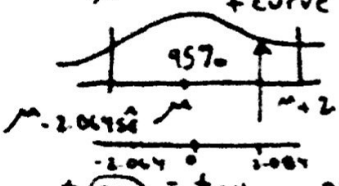
Read: LN pp. L-145 → L-160

intertidal crabs case study

p. L-139

On the basis of the data set, I think ~~you~~ μ is around 25°C ($\bar{y}$), give or take about ~~0.27°C~~ 0.27°C ($\hat{SE}(\bar{y})$),
& I'm 95% confident that μ is somewhere between 24.5°C & 25.6°C

$\hat{SE}$: 0.27°C



long run hist of $\bar{y}$, accounting for uncertainty in $\hat{\sigma}$ (& w/ a sample hist that's close to normal)

$t_{(n-1)} = t_{24}$ ← degrees of freedom

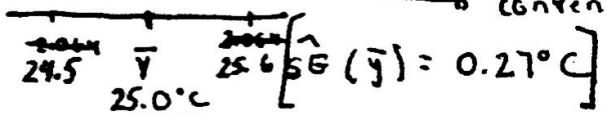
n=25

normal curve: $\bar{y} \pm 2\hat{SE}$ (1.96) for 95% conf

t-table: areas under various t curves w/ various #s of degrees of freedom (LN p. L-142)

95% ← (confidence interval)

conventional choice → 2.064



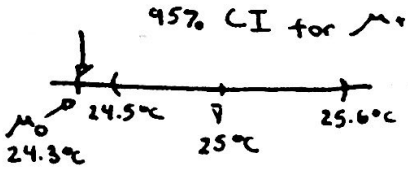
$\bar{y} \pm t_{n-1}^{0.95} \hat{SE}(\bar{y})$

the # (from t-table) such that the area in the middle w/ d.f. is 95%

R-22 $t_{n-1, 0.95} = t_{n-1}^{0.95}$ →

(2.064)(0.27°C)

· (24.5°C, 25.6°C)



theory value of μ: μ_0

here $\mu_0 = 24.3°C$

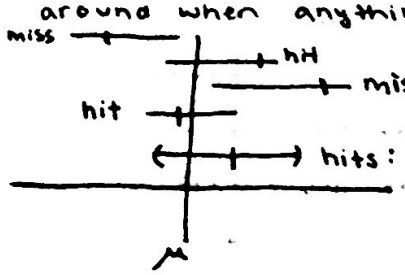
Since $\mu_0 = 24.3°C$ is (not) in the 95% CI for μ, the data set does [not] support the theory that $\mu = 24.3°C$

95% CI runs from 24.5°C to 25.6°C

Q: Does this mean that $P_{as}(24.5°C < \mu < 25.6°C) = 95\%$?

as: repeated sampling (frequentist)

A: unfortunately (no), μ is just a fixed unknown #, not moving around when anything is repeated



about 95% of the CIs would include μ