Confidence Interval - STAT110 Otago

Students also viewed

tatistic

0 terms

Franziska_Klein

Preview

ACCY330 Final Exam

10 terms

amelia2433

Preview

Terms in this set (21)

the standard normal critical value for a 95% interval	1.96
confidence interval formula	*estimate for the mean ± multiplier ± standard error for the mean* $1-\alpha/2)$
the standard normal critical value for a 99% interval	*2.58*
Multiplier formula	z = (x - mean) / sd
what is the *α in the multiplier*	tail probability
Multiplier pattern	when CI is bigger (e.g., 95% to 99%,) the multiplier will be bigger

s_X	sample standard deviation *In practice the true standard deviation σX is not known.* *We estimate it with the sample standard deviation.* *This means our critical values must now come from the ‘t’ distribution, not the standard normal.*
t distribution CI	$\pm t_{(1-\frac{\alpha}{2},\nu)}$
ν(degree of freedom) for t-distribution	*ν = n - 1*
The t-distribution will be the correct sampling distribution if	***either*** *the underlying distribution of X is normal,* ***and/or*** *the sample size is sufficiently large (Central Limit Theorem holds).*
what is degree of freedom in t-distribution	to replace the mean and sd in normal distribution (because t-distribution is always standardised)
when to use t-distribution	when the sample size is small
calculate the estimate sample size when knows the CI	assuming knows the sd and mean (normally given in the question) solve the equation **rounding UP**
Comparing means with CI	$\pm t_{(1-\frac{\alpha}{2},\nu)}$

Using CLT to test appropriate normal distribution	*gives **two values between 0 and n*** if not, then fail the test. $\sqrt{n\pi(}$ *This approximation is good only when:* *n is large* *π is not close to 0 or 1 (this increases symmetry)*
formula for estimating π	P = X / n p = x / n *x is the observed value of X.* (and more)
*Using the **Central Limit Theorem**, the resulting distribution of these proportions is approximately normal if*	*n is large enough* *π far enough from 0 or 1.* *As before, we judge this using:* *nπ +- V nπ(1 - π) gives values between 0 and n.*
Derivation of the mean of the sampling distribution	If P = X / n, then *μ_P = π* sd = *σ_P = sqrt ([π(1 - π) / n])*
95% confidence interval for π *(use the sample proportion (p) to estimate the unknown true population proportion (π))*	$1.96\sqrt{\frac{p(1 -}{n}}$
margin of error	multipliers * sd
note for CI	*This confidence interval (and margin of error) are correct only if the normal approximation to the binomial is appropriate.* *In practice, bias due to non-response should also be considered in our interpretation of an estimate.*