Module 9b – Inference Continued (Practice)

Review Against All Odds: Unit 26 (Inference)

Inference in practice – one sample z/t-test

- Z-test (example 17.7 on page 402)
- Avg systolic blood pressure for males ages 35 to 44: **128 mmHg**
- Population standard deviation: **15** (we can use z-test)
- Avg syst B.P. for a random sample of **72** corporate executives: **126.07**

- **Null Hyp. H_0**: Corp. Exec. B.P.= 128 (no difference)
- **Alt Hyp. H_a:** Corp. Exec. B.P. is greater or less than 128 (2-sided hyp)

$$z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$$

μ=pop mean/some standard value
$\bar{x}$=sample mean
n=sample size
σ = population standard deviation

Inference in practice – one sample z/t-test

- z =[126.07-128] / [15 / √72]
- z = -1.09 (the sample avg for exec. is 1.09 stand. error terms below the overall average of 128)

- We reject the null hypothesis if
  - …the absolute value of ***"z" (or test statistic)*** is greater than the ***critical value.***
  - …because if "z" is greater than the critical value, that means the ***p-value*** is less than the ***alpha level.***

$$z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$$

μ=pop mean/some standard value
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Inference in practice – one sample z/t-test

- z = -1.09 (abs value 1.09)
- How do we find the critical value?
  - If we assume an alpha level of .05 (and we usually do), we look for the value in row "z" associated with .05
  - The critical value for a two-sided hypothesis at alpha .05 is 1.960.
  - Because 1.09 < 1.960, we know that the p-value is greater than .05, and therefore ***we fail to reject the null.***

z^*	0.674	0.841	1.036	1.282	1.645	1.960	2.054	2.326	2.576	2.807	3.091	3.291
One-sided *P*	.25	.20	.15	.10	.05	.025	.02	.01	.005	.0025	.001	.0005
Two-sided *P*	.50	.40	.30	.20	.10	.05	.04	.02	.01	.005	.002	.001

Significance test results

for z-test if alpha=.05