V30 - Hypothesis Testing – Part 6

- Sample proportion
- Use of Z distribution for inference on population proportion

Course: Statistical Testing & Regression
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Inference for One Proportion p

sample proportion $\hat{p}$

$$\hat{p} = \frac{Y}{n}$$

Y total successes count

n is number trials

Bernoulli

$Y \sim$ Binomial distribution

* Use Normal distribution to approximate Binomial Distribution

* when $np \geq 5$ and $n(1-p) \geq 5$

Inference for One Proportion p

Test Statistic:

need to estimate

$$z = \frac{\hat{p} - p}{\sqrt{p(1-p)/n}}$$

0.75

H_0: $p = p_0$

H_1: $p \neq p_0$

p_0 is hypothesized proportion

$$Z = \frac{\hat{p} - p_0}{\sqrt{p_0(1-p_0)/n}}$$

Inference for One Proportion p

Key Assumption:

$$np_o \geq \underline{\;5\;} \quad \text{and } n(1 - p_o) \geq \underline{\;5\;}$$

Inference for One Proportion p

Relationship to Confidence Interval

$H_0: p = p_0$

$H_0: p = \underline{0.50} = p_0$

(0.25 , 0.75) $p_0 = 0.50$ plausible $\underline{\text{lch}} < p < \underline{\text{uch}}$

(0.10 , 0.20) $p_0 = 0.50$ not plausible for p

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