The UNIVERSITY *of* NORTH CAROLINA
at CHAPEL HILL

STOR 155 Introductory Statistics

Lecture 18: Inference for a single proportion

Section 8.1

Normal Approximation for Counts and Proportions

- Let $X \sim B(n, p)$ and $\hat{p} = X / n.$
- If n is large, then

$$\hat{p} \text{ is approx. } N(p, \sqrt{p(1-p)/n}).$$

- Rule of Thumb: $np \geq 10$, $n(1 - p) \geq 10$.

Confidence Interval for *p*

- Expression: $\left[\ \hat{p} - m \ , \quad \hat{p} + m \ \right]$

  where the margin of error $m = z^* \sqrt{\hat{p}(1-\hat{p})/n}$

  – Assumption: *n* is large
  – Confidence level *C* determines z^*