PUB – POS 316
Week 8a

Normal Distribution, Central Limit Theorem (continued)

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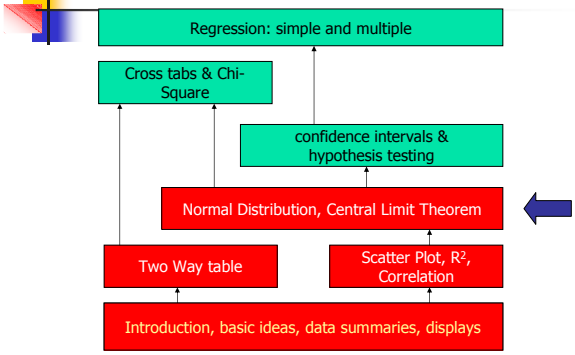
Course Road Map



The Main Procedure

- Applications of standard normal distribution to the study of
  - 1) population (mean)
  - 2) samples (mean)
  - 3) samples (proportion)

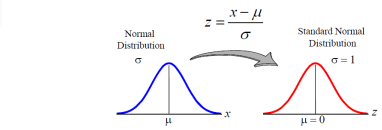
The Main Procedure

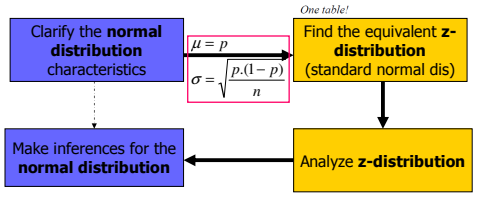
- 3) samples (proportion)
- There are many cases in which we ask a kind of yes/no questions and we are interested in proportion of answers.
- Examples:
  - What is the proportion of UAlbany professors who are tenured?
    - E.g., 325/500=0.65 (between 0 and 1)
  - What is the proportion of Americans who agree with Obama's health care plan?
  - What is the proportion of Americans who vote for Obama?
  - What is the proportion of students who … ?

The Main Procedure

- 3. samples (proportion)
- Example: Suppose 60% of people agree with Obama's health reform. We poll 25 people . What is the probability that we get a sample proportion of less than 0.51?

The Main Procedure

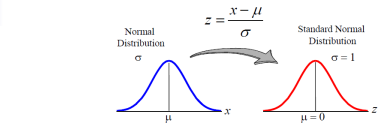


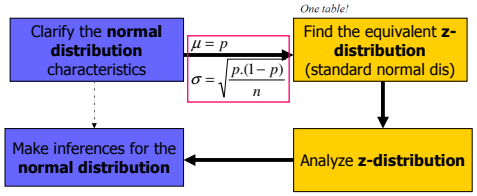


The Main Procedure

- 3. samples (proportion)
- Example: Suppose 60% of people agree with Obama's health reform. We poll 25 people . What is the probability that we get a sample proportion of less than 0.51?
  - Mean is 0.6
  - St dev = sqrt[p*(1-p)/n]
    - sqrt[0.6*(1-0.6)/25] or sqrt[0.5*(1-0.5)/25]

The Main Procedure

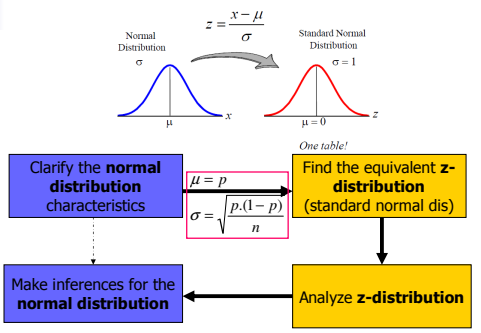




The Main Procedure

- 3. samples (proportion)
- Example G: Suppose 53.4% of Americans want to vote for Obama in the next presidential election. Of course nobody knows this number and people do surveys to estimate it. The Fox news agency tries to estimate this number by taking a sample from 100 people. What is the probability that this agency comes up with the result of less than 50%?

The Main Procedure



Summary – what I expect you to remember

- Density curve
- Normal distribution – N(μ, σ).
- Standard normal distribution is a normal distribution with μ=0, σ=1. - N(0, 1).
- Many times we want to transform a normal distribution to a standard normal distribution in order to be able to say something about the distribution.
- Use: Z=(X- μ)/ σ
- The central limit theorem

Summary – what I expect you to remember