Stat 104 – Lecture 18

Sampling Distribution

- The sampling distribution of a sample statistic displays the variation in repeated random samples from a given population.

1

Eye Color

- Population – 1704 introductory statistics students.
- Parameter – Proportion of the population with blue eyes.
- Sample – 100 students at random.

2

Random Samples

- First Sample
  - –Sample proportion of blue eyes.
- Second Sample
  - –Sample proportion of blue eyes.
- Third Sample
  - –Sample proportion of blue eyes.

3

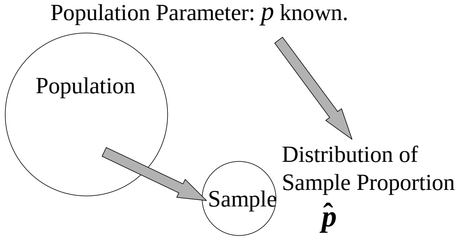
Sampling Distribution

- Shows how a sample statistic, like the sample proportion, varies from sample to sample.
- Would like to model the distribution of a sample statistic.

4

Sampling Distributions

Qualitative/Categorical variable
Population Parameter: p known.



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Simulation

- Population
  - Reese's Pieces
  - www.rossmanchance.com/applets/Reeses/ReesesPieces.html
- Population Parameter
  - Proportion of Orange Reese's Pieces

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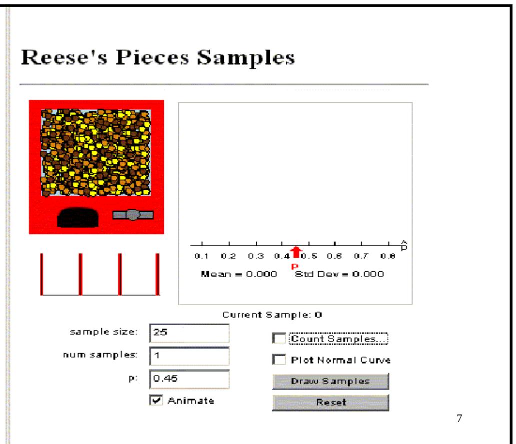

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Simulation

- Simple random sample of size n=25.
- Repeat several times.
- Record the sample proportion of orange Reese's Pieces.

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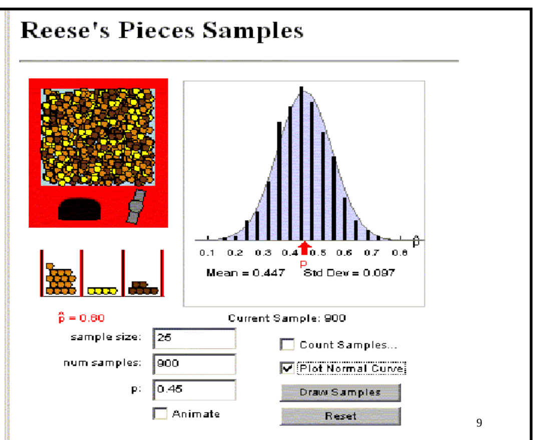

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Distribution of sample proportion $\hat{p}$

- Shape: Approximately Normal
- Center: The mean is p.
- Spread: The standard deviation is $\sqrt{\frac{p(1-p)}{n}}$

10

Conditions

- Must take a random sample from the distribution.
- The sample size, n, must be large enough to insure that both np and $n(1 - p)$ are greater than 15.

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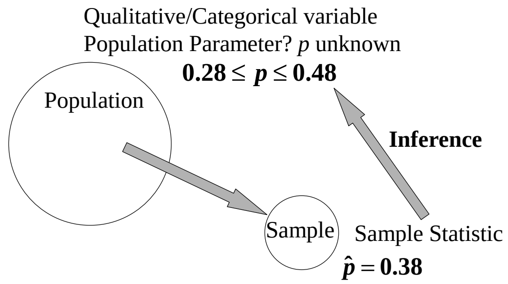
Sampling Distributions



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