STAT 231-Lecture 1

Fall 2016

STAT 230 and STAT 231

- How are the two courses related?

  - STAT 230: Going from the large to the small. We know the parameters and we want to calculate the probability of observing an event.

  - STAT 231: Going from the small to the large. We have observed an event (sample), and we want to make inferences about the parameter.
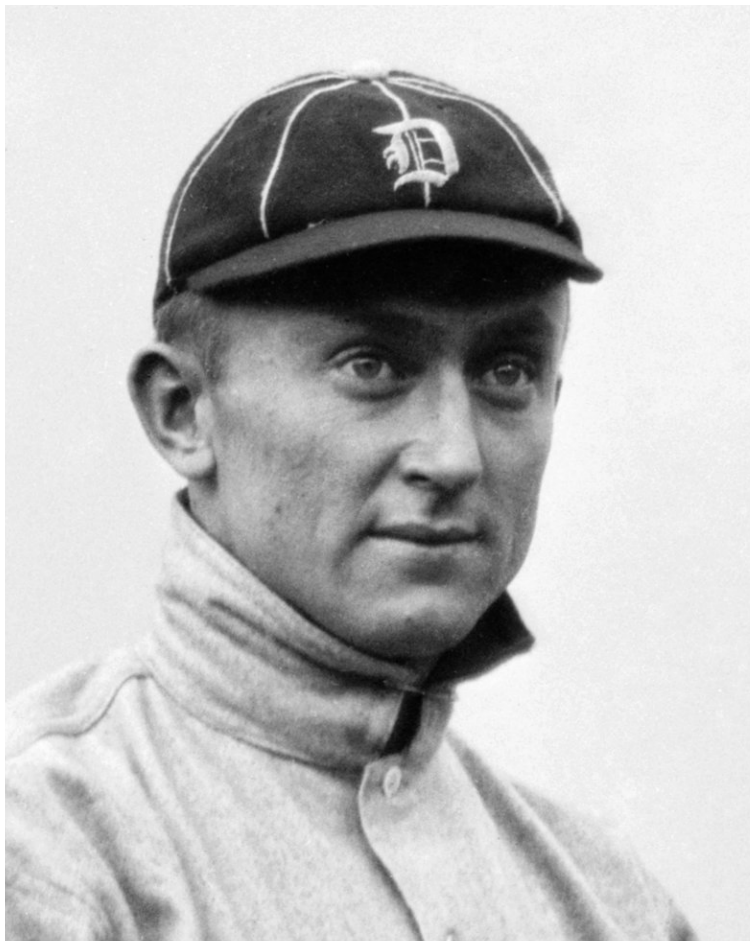
STAT 230 and STAT 231

- Typical Question in STAT 230: Suppose a fair coin is tossed 100 times. What is the probability that we would observe 60 heads?

- Typical question in STAT 231: Suppose a coin is tossed 100 times and we see 60 heads. What can we say about the "fairness" of the coin?

Example 1: Batting Champion in Baseball

- Batting Champion: Hitter with the highest batting average in one season (162 games)
- (Minimum of 3.1 PA/game)

- List of 400 hitters:
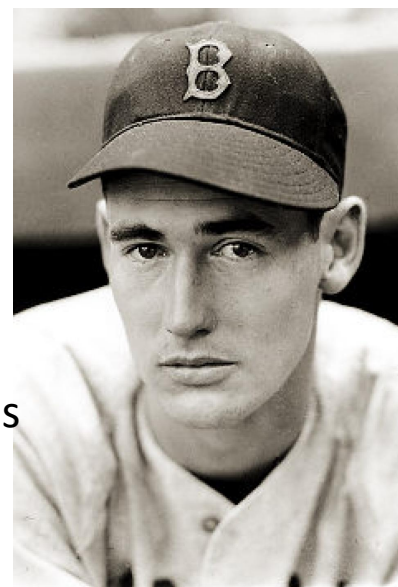 - # of hitters above 400 (1901-1941): 13
  - Since 1941, # above 400: 0
- Why?

400 hitters of the past

Roger Hornsby

Ted Williams

Ty Cobb

The Challenger Disaster

- January 28th, 1986: The Space shuttle Challenger crashed on take-off.

- 7 people died

- O-ring failed

- The "right" data analysis could have prevented this tragedy?

What does a 5 sigma test mean?

- http://blogs.scientificamerican.com/observations/five-sigmawhats-that/

- Higgs-Boson particle detection was a 5 sigma test.

Other Applications:

- Are experts truly experts?
  - TV weathermen
  - ESPN Pundits
  - Mutual Fund Managers
- How to test for claims made in advertising: Tim Horton's Example.