

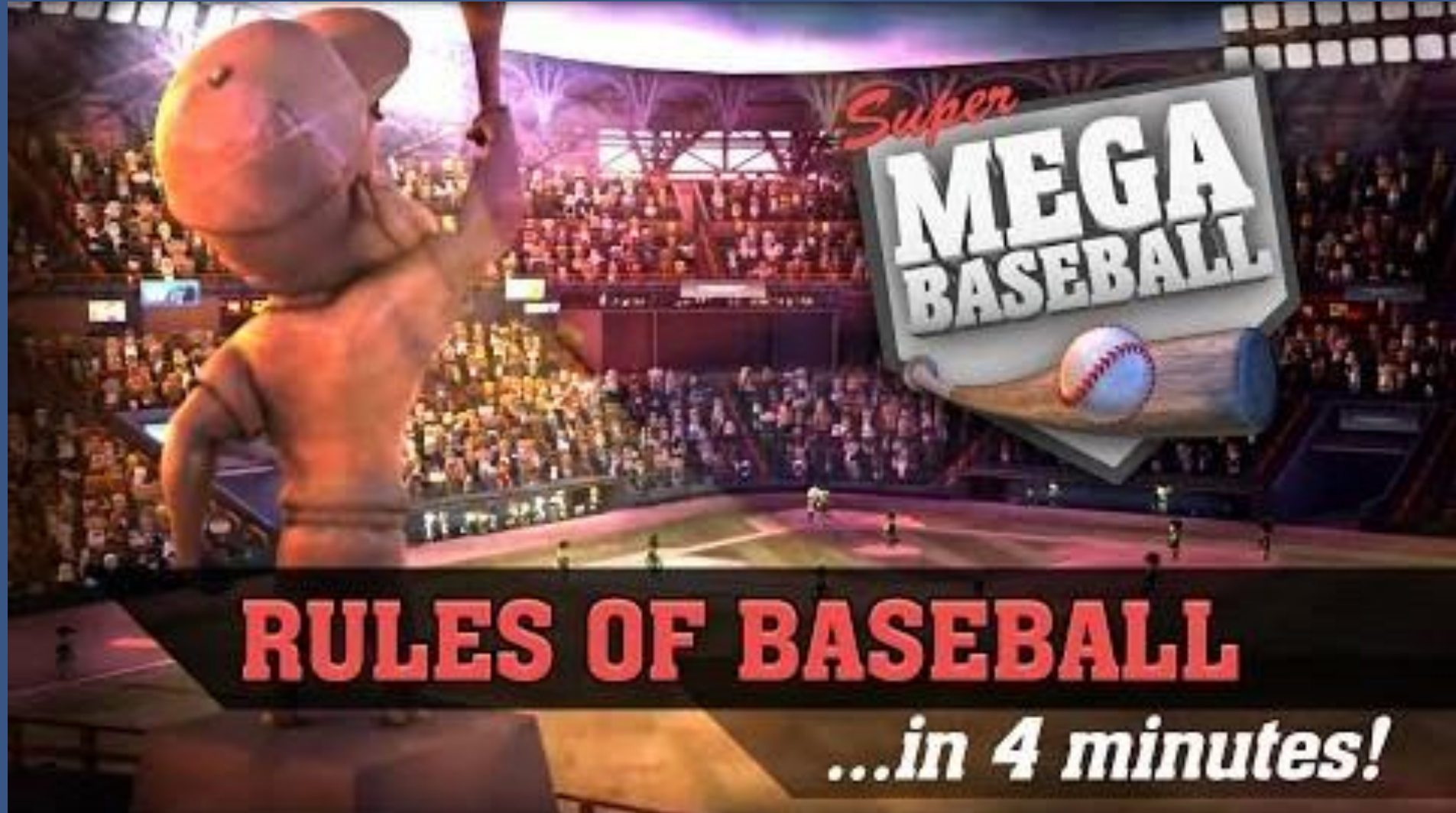


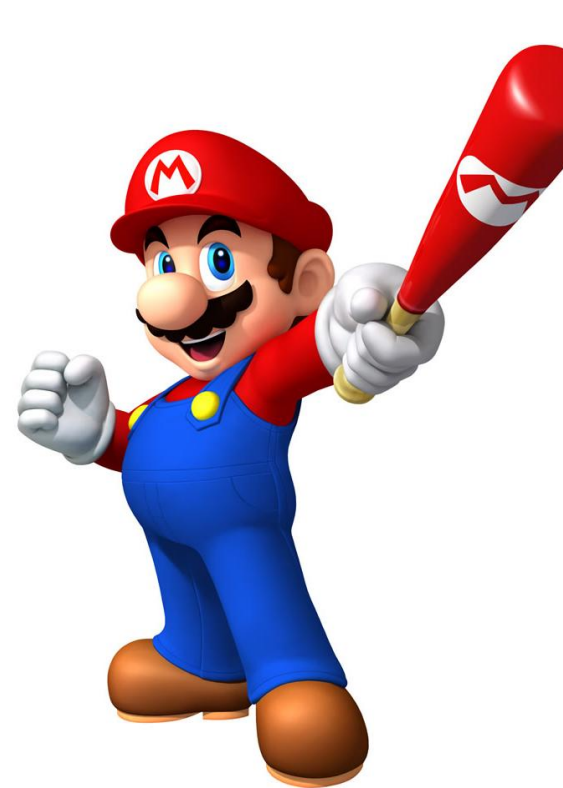
# Baseball I



Produced by Dr. Mario | UNC STOR 538

# Overview of Baseball





# History of Sabermetrics

- **Society of American Baseball Research (SABR)**
  - August 10, 1971 in Cooperstown, NY
  - Founded by Bob Davids
  - 16 Original "Statihistorians"
  - Publication: *Baseball Research Journal*
  - Yearly Dues: \$80 (Standard) or \$25 (Student)
- **Objectives of SABR**
  - To foster the study of baseball as a significant American social and athletic institution.
  - To establish an accurate historical account of baseball through the years.
  - To facilitate the dissemination of baseball research information.
  - To stimulate the best interests of baseball as our national pastime.
  - To cooperate in safeguarding the proprietary interests of individual research efforts of members of the Society.







# History of Sabermetrics

- **Bill James**
  - Author and Researcher Focused on Baseball
  - Publication: *Baseball Abstracts* (Annual Since 1977)
  - Term Coined in 1980: "Saber" = "SABR"
  - Sabermetrics Is the Search for Objective Knowledge About Baseball
  - One of Time Magazines 100 Most Influential (2006)
- **Sabermetrics**
  - Using Mathematics and Statistics to Understand Baseball
  - Development of Advanced Metrics to Measure Performance
  - Textbooks by Gabriel Costa, Michael Huber, and John Saccoman
    - *Understanding Sabermetrics* (2008)
    - *Practicing Sabermetrics* (2009)



# History of Sabermetrics



- *Moneyball: The Art of Winning an Unfair Game*
  - Authored by Michael Lewis (2003)
  - About Oakland Athletics MLB Season in 2002
  - General Manager Billy Beane
  - Finished with the Same Number of Wins as New York Yankees
  - Payroll Difference: \$44M to \$125M
  - Statistical Analyses Proved Flaws in Classic Statistics
  - Identified Undervalued Players Using Different Metrics such as On-Base Percentage
  - Used Statistics to Modify Playing Style (Devaluation of Steals)



# History of Sabermetrics



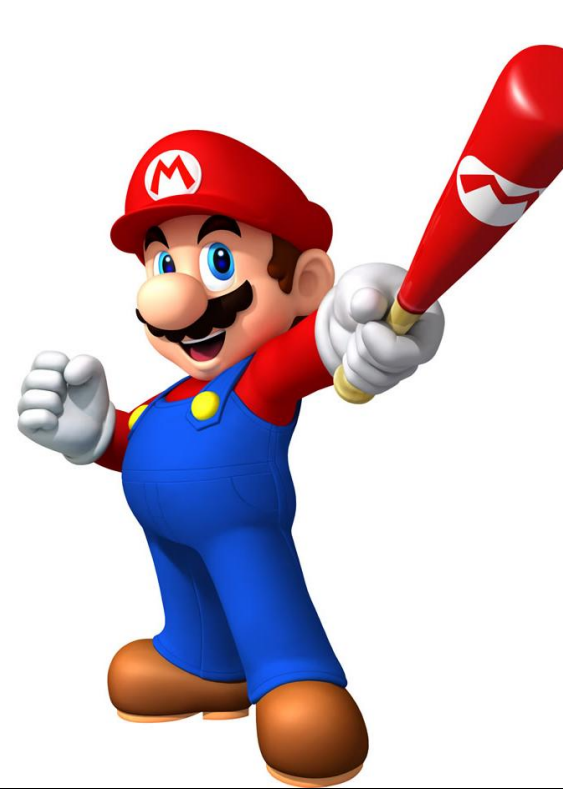


# History of Sabermetrics

- Jim Albert
  - Statistics Professor at Bowling Green State University
  - *Sabermetrics: The Past, The Present, and The Future* (2010)
  - *Analyzing Baseball Data with R* (2014)
- Useful Websites
  - [www.baseballprospectus.com](http://www.baseballprospectus.com)
  - [www.hardballtimes.com](http://www.hardballtimes.com)
  - [www.retrosheet.org](http://www.retrosheet.org)
- Free Data Sources
  - Lahman Database
  - Retrosheet
  - PITCH F/X



# Classic and Modern Metrics



- **Measuring Batting**
  - Batting Average (AVG)

$$AVG = \frac{H}{AB}$$

- On-base Percentage (OBP)

$$OBP = \frac{H + BB + HBP}{AB + BB + HBP + SF}$$

- Slugging Percentage (SLG)

$$SLG = \frac{S + 2D + 3T + 4HR}{AB}$$

- OPS

$$OPS = OBP + SLG$$

H = Hit

AB = At-bat

BB = Walk

HBP = Hit by Pitch

SF = Sacrifice Fly

S = Single

D = Double

T = Triple

HR = Home Run

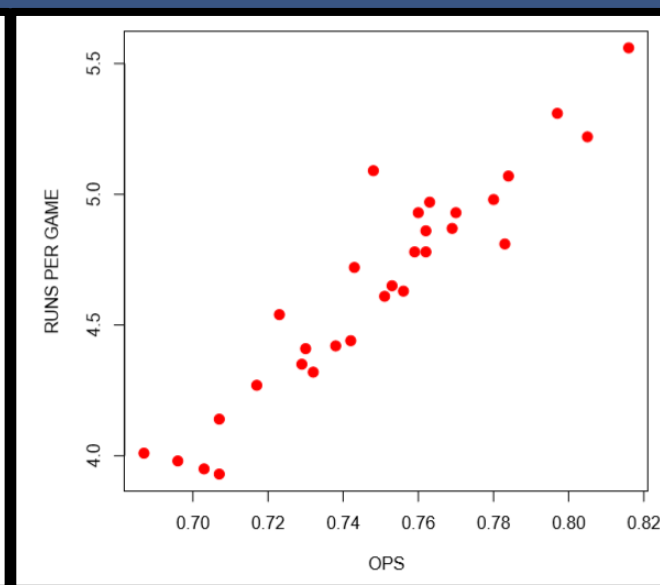
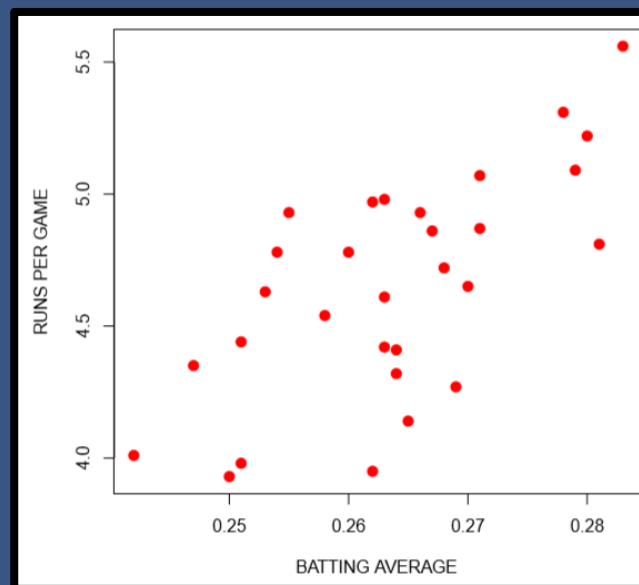






# Classic and Modern Metrics

- Measuring Batting
  - Runs Per Game (R/G)



H = Hit  
AB = At-bat  
BB = Walk  
HBP = Hit by Pitch  
SF = Sacrifice Fly  
S = Single  
D = Double  
T = Triple  
R = Run  
G = Game



# Classic and Modern Metrics



- **Measuring Pitching**
  - Win Percentage (WIN%)

$$WIN\% = \frac{W}{W + L}$$

- Earned Run Average (ERA)

$$ERA = 9 \times \frac{ER}{IP}$$

- Strikeout Rate (K/9)

$$K/9 = 9 \times \frac{K}{IP}$$

- Defense-Independent Pitching Statistic (DIPS)
- DICE

$$DICE = 3 + \frac{13 \times HR + 3(BB + HBP) - 2 \times K}{IP}$$

W = Win

L = Loss

ER = Earned Run

IP = Innings

K = Strikeout

HR = Home Run

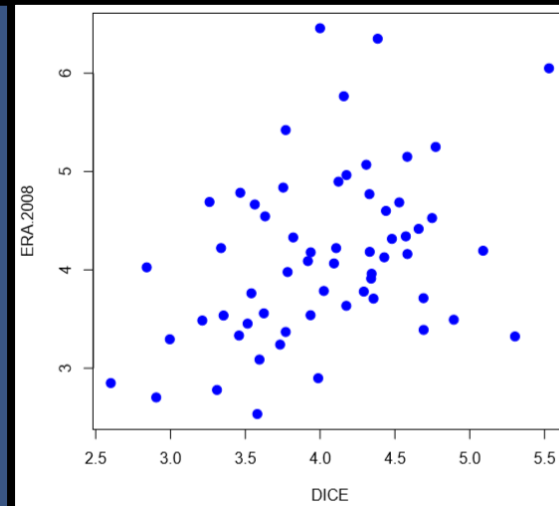
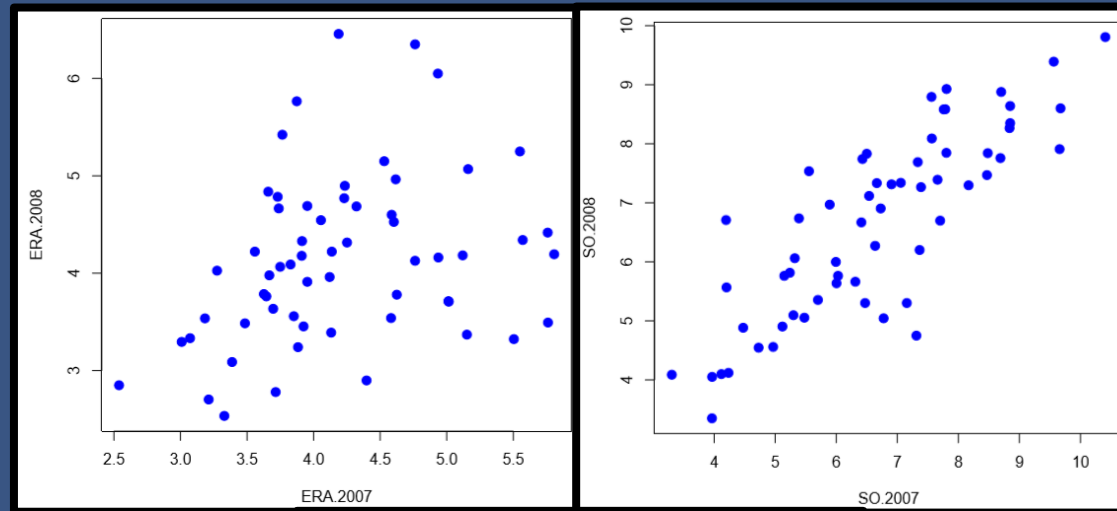
BB = Walk

HBP = Hit by Pitch



# Classic and Modern Metrics

- Measuring Pitching



W = Win

L = Loss

ER = Earned Run

IP = Innings

K = Strikeout

HR = Home Run

BB = Walk

HBP = Hit by Pitch



# Classic and Modern Metrics



- Measuring Fielding
  - Fielding Percentage (FLD%)

$$FLD\% = \frac{PO + A}{PO + A + E}$$

- Range Factor (RF)

$$RF = 9 \times \frac{PO + A}{IP}$$

PO = Put-out

A = Assists

E = Errors





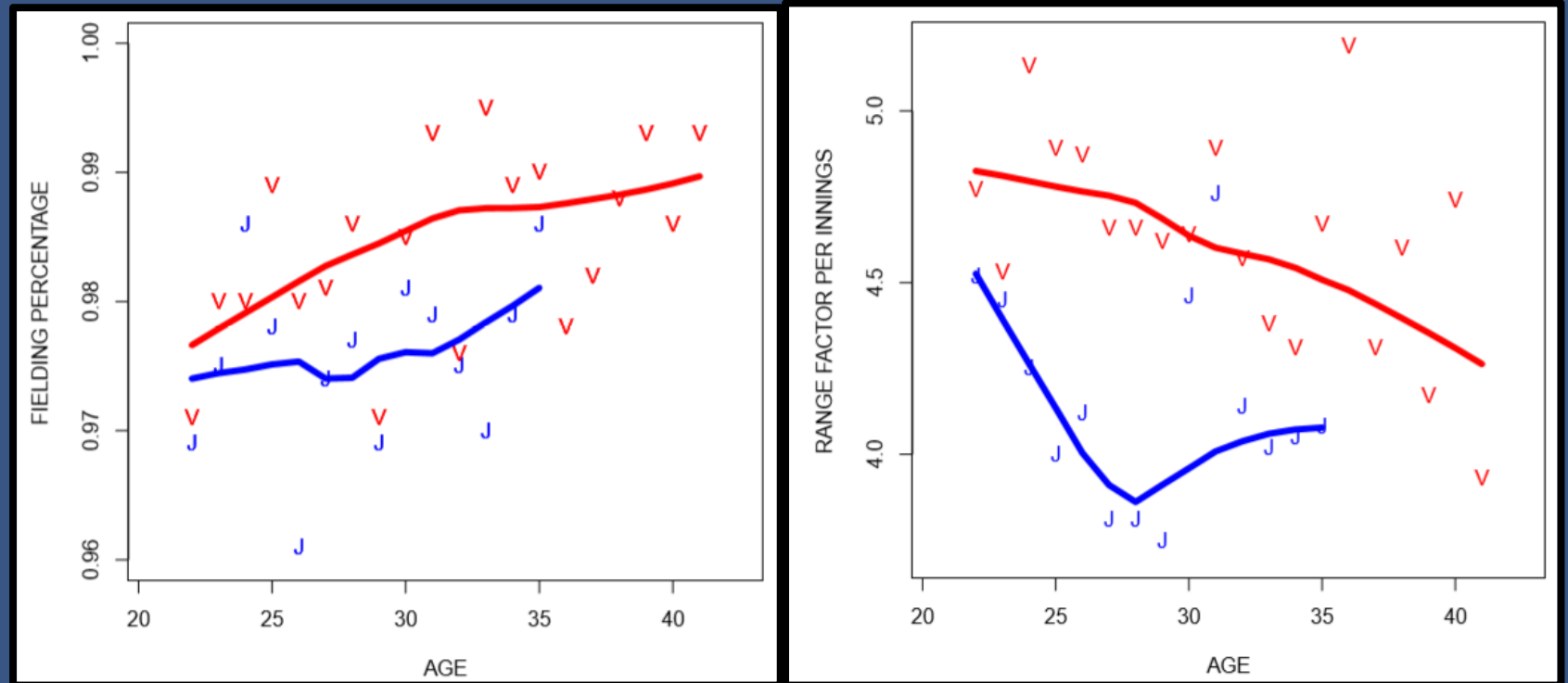
# Classic and Modern Metrics

PO = Put-out

A = Assists

E = Errors

- Measuring Fielding
  - Omar Vizquel and Derek Jeter
    - Omar (9 Golden Gloves)
    - Derek (3 Golden Gloves)





# Final Inspiration

There's No Crying in Statistics.

- Mahatma Mario