Package ‘Lahman’

Type Package
Title Sean ‘Lahman’ Baseball Database
Version 11.0-0
Date 2023-04-16
Author Michael Friendly [aut],
      Chris Dalzell [cre, aut],
      Martin Monkman [aut],
      Dennis Murphy [aut],
      Vanessa Foot [ctb],
      Justeena Zaki-Azat [ctb],
      Sean Lahman [cph]
Maintainer Chris Dalzell <cdalzell@gmail.com>
Description Provides the tables from the ‘Sean Lahman Baseball Database’ as
      a set of R data.frames. It uses the data on pitching, hitting and fielding
      performance and other tables from 1871 through 2022, as recorded in the 2023
      version of the database. Documentation examples show how many baseball
      questions can be investigated.
Language en-US
Depends R (>= 3.5.0)
Suggests lattice, ggplot2, googleVis, data.table, vcd, reshape2,
       tidyr, knitr, rmarkdown, car
Imports dplyr
Encoding UTF-8
License GPL
URL https://CRAN.R-project.org/package=Lahman
LazyLoad yes
LazyData yes
LazyDataCompression xz
BugReports https://github.com/cdalzell/Lahman/issues
Repository CRAN
NeedsCompilation no
RoxygenNote 7.1.1
VignetteBuilder knitr
Date/Publication 2023-05-04 08:40:02 UTC

R topics documented:

Lahman-package ................................................. 3
AllstarFull ...................................................... 5
Appearances ..................................................... 6
AwardsManagers ............................................... 8
AwardsPlayers .................................................. 10
AwardsShareManagers ............................... 11
AwardsSharePlayers ........................................... 12
Batting ........................................................... 14
battingLabels .................................................. 18
BattingPost ..................................................... 19
battingStats ................................................... 21
CollegePlaying ............................................... 22
Fielding ......................................................... 23
FieldingOF ...................................................... 25
FieldingOFsplit ............................................. 27
FieldingPost ................................................... 28
HallOfFame ..................................................... 30
HomeGames ................................................... 33
Label ............................................................ 34
LahmanData ..................................................... 35
Managers ......................................................... 37
ManagersHalf ................................................ 40
Parks ............................................................. 41
People ........................................................... 42
Pitching .......................................................... 44
PitchingPost ................................................... 47
playerInfo ..................................................... 50
Salaries .......................................................... 51
Schools .......................................................... 53
SeriesPost .......................................................... 54
Teams ............................................................. 56
TeamsFranchises ............................................. 61
TeamsHalf ....................................................... 62

Index 64
Description

This database contains pitching, hitting, and fielding statistics for Major League Baseball from 1871 through 2021. It includes data from the two current leagues (American and National), the four other "major" leagues (American Association, Union Association, Players League, and Federal League), and the National Association of 1871-1875.

This database was created by Sean Lahman, who pioneered the effort to make baseball statistics freely available to the general public. What started as a one man effort in 1994 has grown tremendously, and now a team of researchers have collected their efforts to make this the largest and most accurate source for baseball statistics available anywhere.

This database, in the form of an R package offers a variety of interesting challenges and opportunities for data processing and visualization in R.

In the current version, the examples make extensive use of the dplyr package for data manipulation (tabulation, queries, summaries, merging, etc.), reflecting the original relational database design and ggplot2 for graphics.

Details

<table>
<thead>
<tr>
<th>Package</th>
<th>Lahman</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Package</td>
</tr>
<tr>
<td>Version</td>
<td>11.0-0</td>
</tr>
<tr>
<td>Date</td>
<td>2023-04-16</td>
</tr>
<tr>
<td>License</td>
<td>GPL version 2 or newer</td>
</tr>
<tr>
<td>LazyLoad</td>
<td>yes</td>
</tr>
<tr>
<td>LazyData</td>
<td>yes</td>
</tr>
</tbody>
</table>

The main form of this database is a relational database in Microsoft Access format. The design follows these general principles: Each player is assigned a unique code (playerID). All of the information in different tables relating to that player is tagged with his playerID. The playerIDs are linked to names and birthdates in the People table. Similar links exist among other tables via analogous *ID variables.

The database is composed of the following main tables:

- **People**  Player names, dates of birth, death and other biographical info
- **Batting** batting statistics
- **Pitching** pitching statistics
- **Fielding** fielding statistics

A collection of other tables is also provided:
- **Teams**:
Post-season play:

- **BattingPost**: post-season batting statistics
- **PitchingPost**: post-season pitching statistics
- **FieldingPost**: post-season fielding data
- **SeriesPost**: post-season series information

Awards:

- **AwardsManagers**: awards won by managers
- **AwardsPlayers**: awards won by players
- **AwardsShareManagers**: award voting for manager awards
- **AwardsSharePlayers**: award voting for player awards

Hall of Fame: links to People via hofID

- **HallOfFame**: Hall of Fame voting data

Other tables:

- **AllstarFull**: All-Star games appearances
- **Managers**: managerial statistics
- **FieldingOF**: outfield position data
- **ManagersHalf**: split season data for managers
- **Salaries**: player salary data
- **Appearances**: data on player appearances
- **Schools**: Information on schools players attended
- **CollegePlaying**: Information on schools players attended, by player and year

Variable label tables are provided for some of the tables:

- **battingLabels**, **pitchingLabels**, **fieldingLabels**

**Author(s)**

Michael Friendly, Dennis Murphy, Chris Dalzell, Martin Monkman

Maintainer: Chris Dalzell <cdalzell@gmail.com>

**Source**

AllstarFull  AllstarFull table

Description

All Star appearances by players

Usage

data(AllstarFull)

Format

A data frame with 5516 observations on the following 8 variables.

- playerID: Player ID code
- yearID: Year
- gameNum: Game number (for years in which more than one game was played)
- gameID: Game ID code
- teamID: Team; a factor
- lgID: League; a factor with levels AL NL
- GP: Game played (zero if player did not appear in game)
- startingPos: If the player started, what position he played

Source


Examples

data(AllstarFull)

# find number of appearances by players in the All Star games
player_appearances <- with(AllstarFull, rev(sort(table(playerID))))

# How many All-Star players, in total?
length(player_appearances)

# density plot of the whole distribution
plot(density(player_appearances), main="Player appearances in All Star Games")
rug(jitter(player_appearances))

# who has played in more than 10 ASGs?
player_appearances[player_appearances > 10]
hist(player_appearances[player_appearances > 10])
# Hank Aaron's All-Star record:
subset(AllstarFull, playerID == "aaronha01")

# Years that Stan Musial played in the ASG:
with(AllstarFull, yearID[playerID == "musiast01"])

# Starting positions he played (NA means did not start)
with(AllstarFull, startingPos[playerID == "musiast01"])

# All-Star rosters from the 1966 ASG
subset(AllstarFull, gameID == "NLS196607120")

# All-Stars from the Washington Nationals
subset(AllstarFull, teamID == "WAS")

# Teams with the fewest All-Stars
rare <- names(which(table(AllstarFull$teamID) < 10))

# Records associated with the 'rare' teams:
# (There are a few teamID typos: can you spot them?)
subset(AllstarFull, teamID %in% rare)

### Appearances table

<table>
<thead>
<tr>
<th>Description</th>
<th>Data on player appearances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usage</td>
<td>data(Appearances)</td>
</tr>
<tr>
<td>Format</td>
<td>A data frame with 112106 observations on the following 21 variables.</td>
</tr>
</tbody>
</table>
Appearances

G_c Games as catcher
G_1b Games as firstbaseman
G_2b Games as secondbaseman
G_3b Games as thirdbaseman
G_ss Games as shortstop
G_1f Games as leftfielder
G_cf Games as centerfielder
G_rf Games as right fielder
G_of Games as outfielder
G_dh Games as designated hitter
G_ph Games as pinch hitter
G_pr Games as pinch runner

Details

The Appearances table in the original version has some incorrect variable names. In particular, the 5th column is career_year.

Source


Examples

data(Appearances)
lahydr("dplyr")
lahydr("tidyr")

# Henry Aaron's last two years as a DH in Milwaukee
Appearances %>%
  filter(playerID == "aaronha01" & teamID == "ML4") %>%
  select(yearID:G_batting, G_of:G_ph) # subset variables

# Herb Washington, strictly a pinch runner for Oakland in 1974-5
Appearances %>%
  filter(playerID == "washihe01")

# A true utility player - Jerry Hairston, Jr.
Appearances %>%
  filter(playerID == "hairsje02")

# Appearances for the 1984 Cleveland Indians
Appearances %>%
  filter(teamID == "CLE" & yearID == 1984)

# Pete Rose's primary position each year of his career
Appearances %>%
filter(playerID == 'rosepe01') %>%
group_by(yearID, teamID) %>%
gather(pos, G, G_1b:G_rf) %>%
filter(G == max(G)) %>%
select(yearID:G_all, pos, G) %>%
mutate(pos = substring(as.character(pos), 3, 4)) %>%
arrange(yearID, teamID)

# Most pitcher appearances each year since 1950
Appearances %>%
  filter(yearID >= 1950) %>%
  group_by(yearID) %>%
  summarise(maxPitcher = playerID[which.max(G_p)],
    maxAppear = max(G_p))

# Individuals who have played all 162 games since 1961
all162 <- Appearances %>%
  filter(yearID > 1960 & G_all == 162) %>%
  arrange(yearID, playerID) %>%
  select(yearID:G_all)

# Number of all-gamers by year (returns a vector)
table(all162$yearID)

# Players with most pinch hitting appearances in a year
Appearances %>%
  arrange(desc(G_ph)) %>%
  select(playerID, yearID, teamID, lgID, G_all, G_ph) %>%
  head(., 10)

# Players with most pinch hitting appearances, career
Appearances %>%
  group_by(playerID) %>%
  select(playerID, G_all, G_ph) %>%
  summarise(G = sum(G_all), PH = sum(G_ph)) %>%
  arrange(desc(PH)) %>%
  head(., 10)

# Players with most career appearances at each position
Appearances %>%
  select(playerID, C:RF) %>%
  rename(C = G_c, '1B' = G_1b, '2B' = G_2b, SS = G_ss,
        '3B' = G_3b, LF = G_lf, CF = G_cf, RF = G_rf) %>%
  gather(pos, G, C:RF) %>%
  group_by(pos, playerID) %>%
  summarise(G = sum(G)) %>%
  arrange(desc(G)) %>%
  do(head(., 1))
AwardsManagers

Description

Award information for managers awards

Usage

data(AwardsManagers)

Format

A data frame with 179 observations on the following 6 variables.

playerID  Manager (player) ID code
awardID  Name of award won
yearID  Year
lgID  League; a factor with levels AL NL
tie  Award was a tie (Y or N)
notes  Notes about the award

Source


Examples

# Post-season managerial awards

# Number of recipients of each award by year
with(AwardsManagers, table(yearID, awardID))

# 1996 award winners
subset(AwardsManagers, yearID == 1996)

# AL winners of the BBWAA managerial award
subset(AwardsManagers, awardID == "BBWAA Manager of the year" &
     lgID == "AL")

# Tony LaRussa’s manager of the year awards
subset(AwardsManagers, playerID == "larusto01")
AwardsPlayers

AwardsPlayers table

Description

Award information for players awards

Usage

data(AwardsPlayers)

Format

A data frame with 6879 observations on the following 6 variables.

- playerID  Player ID code
- awardID  Name of award won
- yearID  Year
- lgID  League; a factor with levels AA AL ML NL
- tie  Award was a tie (Y or N)
- notes  Notes about the award

Source


Examples

data(AwardsPlayers)
# Which awards have been given and how many?
with(AwardsPlayers, table(awardID))
awardtab <- with(AwardsPlayers, table(awardID))

# Plot the awardtab table as a Cleveland dot plot
library("lattice")
dotplot(awardtab)

# Restrict to MVP awards
mvp <- subset(AwardsPlayers, awardID == "Most Valuable Player")
# Who won in 1994?
mvp[mvp$yearID == 1994L, ]

goldglove <- subset(AwardsPlayers, awardID == "Gold Glove")
# which players won most often?
GGcount <- table(goldglove$playerID)
GGcount[GGcount>10]
# Triple Crown winners
subset(AwardsPlayers, awardID == "Triple Crown")

# Simultaneous Triple Crown and MVP winners
# (compare merged file to TC)
TC <- subset(AwardsPlayers, awardID == "Triple Crown")
MVP <- subset(AwardsPlayers, awardID == "Most Valuable Player")
keepvars <- c("playerID", "yearID", "lgID.x")
merge(TC, MVP, by = c("playerID", "yearID"))[ ,keepvars]

## AwardsShareManagers table

### Description

Award voting for managers awards

### Usage

data(AwardsShareManagers)

### Format

A data frame with 425 observations on the following 7 variables.

- **awardID**: name of award votes were received for
- **yearID**: Year
- **lgID**: League; a factor with levels AL NL
- **playerID**: Manager (player) ID code
- **pointsWon**: Number of points received
- **pointsMax**: Maximum number of points possible
- **votesFirst**: Number of first place votes

### Source

Examples

```
# Voting for the BBWAA Manager of the Year award by year and league
require("dplyr")

# Sort in decreasing order of points by year and league
AwardsShareManagers %>%
group_by(yearID, lgID) %>%
arrange(desc(pointsWon))

# Any unanimous winners?
AwardsShareManagers %>%
filter(pointsWon == pointsMax)

# Manager with highest proportion of possible points
AwardsShareManagers %>%
mutate(propWon = pointsWon/pointsMax) %>%
arrange(desc(propWon)) %>%
head(., 1)

# Bobby Cox's MOY vote tallies
AwardsShareManagers %>%
filter(playerID == "coxbo01")
```

AwardsSharePlayers  
AwardsSharePlayers table

Description

Award voting for managers awards

Usage

data(AwardsSharePlayers)

Format

A data frame with 6879 observations on the following 7 variables.

- **awardID**: name of award votes were received
- **yearID**: Year
- **lgID**: League; a factor with levels AL ML NL
- **playerID**: Player ID code
- **pointsWon**: Number of points received
- **pointsMax**: Maximum number of points possible
- **votesFirst**: Number of first place votes
AwardsSharePlayers

Source


Examples

# Vote tallies for post-season player awards

require("dplyr")

# Which awards are represented in this data frame?
unique(AwardsSharePlayers$awardID)

# Sort the votes for the Cy Young award in decreasing order.
# Until 1967, the award went to the best pitcher
# in both leagues.

cyvotes <- AwardsSharePlayers %>%
  filter(awardID == "Cy Young") %>%
  group_by(yearID, lgID) %>%
  arrange(desc(pointsWon))

# 2012 votes
subset(cyvotes, yearID == 2012)

# top three votegetters each year by league

cy_top3 <- cyvotes %>%
  group_by(yearID, lgID) %>%
  do(head(., 3))
head(cy_top3, 12)

# unanimous Cy Young winners
subset(cyvotes, pointsWon == pointsMax)

## CYA was a major league award until 1967
# Find top five pitchers with most top 3 vote tallies in CYA
# head(with(cya_top3, rev(sort(table(playerID)))), 5)

# Pre-1967

cy_top3 %>%
  filter(yearID <= 1966) %>%
  group_by(playerID) %>%
  summarise(yrs_top3 = n()) %>%
  arrange(desc(yrs_top3)) %>%
  head(., 2)

# 1967+ (both leagues)

cy_top3 %>%
  filter(yearID > 1966) %>%
  group_by(playerID) %>%
  summarise(yrs_top3 = n()) %>%
arrange(desc(yrs_top3)) %>%
head(., 5)

# 1967+ (by league)
cya_top3 %>%
filter(yearID > 1966) %>%
group_by(playerID, lgID) %>%
summarise(yrs_top3 = n()) %>%
arrange(desc(yrs_top3)) %>%
head(., 5)

# Ditto for MVP awards
# Top 3 votegetters for MVP award by year and league
MVP_top3 <- AwardsSharePlayers %>%
  filter(awardID == "MVP") %>%
group_by(yearID, lgID) %>%
arrange(desc(pointsWon)) %>%
do(head(., 3))

tail(MVP_top3)

## Select players with >= 7 top 3 finishes
MVP_top3 %>%
group_by(playerID) %>%
summarise(n_top3 = n()) %>%
arrange(desc(n_top3)) %>%
filter(n_top3 > 6)

Batting  

Batting table

Description

Batting table - batting statistics

Usage

data(Batting)

Format

A data frame with 112184 observations on the following 22 variables.

playerID  Player ID code
yearID  Year
stint  player’s stint (order of appearances within a season)
teamID  Team; a factor
lgID  League; a factor with levels AA AL FL NL PL UA
Batting

G  Games: number of games in which a player played
AB  At Bats
R  Runs
H  Hits: times reached base because of a batted, fair ball without error by the defense
X2B  Doubles: hits on which the batter reached second base safely
X3B  Triples: hits on which the batter reached third base safely
HR  Homeruns
RBI  Runs Batted In
SB  Stolen Bases
CS  Caught Stealing
BB  Base on Balls
SO  Strikeouts
IBB  Intentional walks
HBP  Hit by pitch
SH  Sacrifice hits
SF  Sacrifice flies
GIDP  Grounded into double plays

Details

Variables X2B and X3B are named 2B and 3B in the original database

Source


See Also

battingStats for calculating batting average (BA) and other derived statistics
baseball for a similar dataset, but a subset of players who played 15 or more seasons.
Baseball for data on batting in the 1987 season.

Examples

data(Batting)
head(Batting)
require("dplyr")
## Prelude: Extract information from Salaries and People
## to be merged with the batting data.

# Subset of Salaries data
salaries <- Salaries %>%
  select(playerID, yearID, teamID, salary)
# Subset of People table (player metadata)
peopleInfo <- People %>%
  select(playerID, birthYear, birthMonth, nameLast, nameFirst, bats)

# Left join salaries and peopleInfo to batting data,
# create an age variable and sort by playerID, yearID and stint
# Returns an ignorable warning.
battery <- battingStats() %>%
  left_join(salaries, by = c("playerID", "yearID", "teamID")) %>%
  left_join(peopleInfo, by = "playerID") %>%
  mutate(age = yearID - birthYear - 1L * (birthMonth >= 10)) %>%
  arrange(playerID, yearID, stint)

## Generate a ggplot similar to the NYT graph in the story about Ted
## Williams and the last .400 MLB season

# Restrict the pool of eligible players to the years after 1899 and
# players with a minimum of 450 plate appearances (this covers the
# strike year of 1994 when Tony Gwynn hit .394 before play was suspended
# for the season - in a normal year, the minimum number of plate appearances is 502)
elligibleHitters <- battery %>%
  filter(yearID >= 1900 & PA > 450)

# Find the hitters with the highest BA in MLB each year (there are a
# few ties). Include all players with BA > .400, whether they
# won a batting title or not, and add an indicator variable for
# .400 average in a season.
tophitters <- eligibleHitters %>%
  group_by(yearID) %>%
  filter(BA == max(BA) | BA >= .400) %>%
  mutate(ba400 = BA >= 0.400) %>%
  select(playerID, yearID, nameLast, nameFirst, BA, ba400)

# Sub-data frame for the .400 hitters plus the outliers after 1950
# (averages above .380) - used to produce labels in the plot below
bignames <- tophitters %>%
  filter(ba400 | (yearID > 1950 & BA > 0.380)) %>%
  arrange(desc(BA))

# Variable to provide a vertical offset to certain
# labels in the ggplot below
bignames$yoffset <- c(0, 0, 0, 0, 0.002, 0, 0, 0, 0.001, -0.001, 0, -0.002, 0, 0, 0, 0.002, 0, 0)
# Produce the plot

```r
require("ggplot2")
ggplot(topHitters, aes(x = yearID, y = BA)) +
  geom_point(aes(colour = ba400), size = 2.5) +
  geom_hline(yintercept = 0.400, size = 1, colour = "gray70") +
  geom_text(data = bignames, aes(y = BA + yoffset,
      label = nameLast),
      size = 3, hjust = 1.2) +
  scale_colour_manual(values = c("FALSE" = "black", "TRUE" = "red")) +
  xlim(1899, 2015) +
  xlab("Year") +
  scale_y_continuous("Batting average",
      limits = c(0.330, 0.430),
      breaks = seq(0.34, 0.42, by = 0.02),
      labels = c(".340", ".360", ".380", ".400", ".420")) +
  geom_smooth() +
  theme(legend.position = "none")
```

# after Chris Green,
# http://sabr.org/research/baseball-s-first-power-surge-home-runs-late-19th-century-major-leagues

# Total home runs by year

totalHR <- Batting %>%
  group_by(yearID) %>%
  summarise(HomeRuns = sum(as.numeric(HR), na.rm=TRUE),
             Games = sum(as.numeric(G), na.rm=TRUE))

# Plot HR by year, pre-1919 (dead ball era)
totalHR %>% filter(yearID <= 1918) %>%
  ggplot(. , aes(x = yearID, y = HomeRuns)) +
  geom_line() +
  geom_point() +
  labs(x = "Year", y = "Home runs hit")

# Take games into account

totalHR %>% filter(yearID <= 1918) %>%
  ggplot(. , aes(x = yearID, y = HomeRuns/Games)) +
  geom_line() +
  geom_point() +
  labs(x = "Year", y = "Home runs per game played")

# Widen perspective to all years from 1871

ggplot(totalHR, aes(x = yearID, y = HomeRuns)) +
  geom_point() +
  geom_path() +
  geom_smooth() +
  labs(x = "Year", y = "Home runs hit")

# Similar plot for HR per game played by year -
# shows several eras with spikes in HR hit

ggplot(totalHR, aes(x = yearID, y = HomeRuns/Games)) +
  geom_point() +
  geom_smooth() +
  labs(x = "Year", y = "Home runs per game played")
```
```r
battingLabels <-
  geom_point() +
  geom_path() +
  geom_smooth(se = FALSE) +
  labs(x = "Year", y = "Home runs per game played")
```

**battingLabels**  
**Variable Labels**

### Description

These data frames provide descriptive labels for the variables in the Batting, Pitching and Fielding files (and related *Post files). They are useful for plots and other output using Label.

### Usage

```r
data(battingLabels)
data(fieldingLabels)
data(pitchingLabels)
```

### Format

Each is data frame with observations on the following 2 variables.

- `variable` variable name
- `label` variable label

### See Also

Label

### Examples

```r
data(battingLabels)
str(battingLabels)
require("dplyr")

# find and plot maximum number of homers per year
batHR <- Batting %>%
  filter(!is.na(HR)) %>%
  group_by(yearID) %>%
  summarise(max=max(HR))

with(batHR, {
  plot(yearID, max,
```
```r
xlab=Label("yearID"), ylab=paste("Maximum", Label("HR")),
cex=0.8)
lines(lowess(yearID, max), col="blue", lwd=2)
abline(lm(max ~ yearID), col="red", lwd=2)
}
```

---

**BattingPost**

**BattingPost table**

<table>
<thead>
<tr>
<th>Description</th>
<th>Post season batting statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Usage</strong></td>
<td><code>data(BattingPost)</code></td>
</tr>
<tr>
<td><strong>Format</strong></td>
<td>A data frame with 16374 observations on the following 22 variables.</td>
</tr>
<tr>
<td><code>yearID</code></td>
<td>Year</td>
</tr>
<tr>
<td><code>round</code></td>
<td>Level of playoffs</td>
</tr>
<tr>
<td><code>playerID</code></td>
<td>Player ID code</td>
</tr>
<tr>
<td><code>teamID</code></td>
<td>Team</td>
</tr>
<tr>
<td><code>lgID</code></td>
<td>League; a factor with levels AA AL NL</td>
</tr>
<tr>
<td><code>G</code></td>
<td>Games</td>
</tr>
<tr>
<td><code>AB</code></td>
<td>At Bats</td>
</tr>
<tr>
<td><code>R</code></td>
<td>Runs</td>
</tr>
<tr>
<td><code>H</code></td>
<td>Hits</td>
</tr>
<tr>
<td><code>X2B</code></td>
<td>Doubles</td>
</tr>
<tr>
<td><code>X3B</code></td>
<td>Triples</td>
</tr>
<tr>
<td><code>HR</code></td>
<td>Homeruns</td>
</tr>
<tr>
<td><code>RBI</code></td>
<td>Runs Batted In</td>
</tr>
<tr>
<td><code>SB</code></td>
<td>Stolen Bases</td>
</tr>
<tr>
<td><code>CS</code></td>
<td>Caught stealing</td>
</tr>
<tr>
<td><code>BB</code></td>
<td>Base on Balls</td>
</tr>
<tr>
<td><code>SO</code></td>
<td>Strikeouts</td>
</tr>
<tr>
<td><code>IBB</code></td>
<td>Intentional walks</td>
</tr>
<tr>
<td><code>HBP</code></td>
<td>Hit by pitch</td>
</tr>
<tr>
<td><code>SH</code></td>
<td>Sacrifices</td>
</tr>
<tr>
<td><code>SF</code></td>
<td>Sacrifice flies</td>
</tr>
<tr>
<td><code>GIDP</code></td>
<td>Grounded into double plays</td>
</tr>
</tbody>
</table>

Details

Variables X2B and X3B are named 2B and 3B in the original database.

Source


Examples

# Post-season batting data
# Requires care since intra-league playoffs have evolved since 1969
# Simplest case: World Series

require("dplyr")

# Create a sub-data frame for modern World Series play
ws <- BattingPost %>%
    filter(round == "WS" & yearID >= 1903) %>%
    mutate(BA = 0 + (AB > 0) * round(H/AB, 3),
           TB = H + X2B + 2 * X3B + 3 * HR,
           SA = 0 + (AB > 0) * round(TB/AB, 3),
           PA = AB + BB + IBB + HBP + SH + SF,
           OB = H + BB + IBB + HBP,
           OBP = 0 + (AB > 0) * round(OB/PA, 3) )

# Players with most appearances in the WS:
ws %>%
    group_by(playerID) %>%
    summarise(appearances = n()) %>%
    arrange(desc(appearances)) %>%
    head(., 10)

# Non-Yankees with most WS appearances
ws %>%
    filter(teamID != "NYA") %>%
    group_by(playerID) %>%
    summarise(appearances = n()) %>%
    arrange(desc(appearances)) %>%
    head(., 10)

# Top ten single WS batting averages ( >= 10 AB )
ws %>%
    filter(AB > 10) %>%
    arrange(desc(BA)) %>%
    head(., 10)

# Top ten slugging averages in a single WS
ws %>%
    filter(AB > 10) %>%
    arrange(desc(SA)) %>%
    head(., 10)

# Hitting stats for the 1946 St. Louis Cardinals, ordered by BA
battingStats

ws %>%
  filter(teamID == "SLN" & yearID == 1946) %>%
  arrange(desc(BA))

# Babe Ruth's WS profile
ws %>%
  filter(playerID == "ruthba01") %>%
  arrange(yearID)

---

**battingStats**

*Calculate additional batting statistics*

**Description**

The **Batting** does not contain batting statistics derived from those present in the data.frame. This function calculates batting average (BA), plate appearances (PA), total bases (TB), slugging percentage (SlugPct), on-base percentage (OBP), on-base percentage + slugging (OPS), and batting average on balls in play (BABIP) for each record in a Batting-like data.frame.

**Usage**

```
battingStats(data = Lahman::Batting,
  idvars = c("playerID", "yearID", "stint", "teamID", "lgID"),
  cbind = TRUE)
```

**Arguments**

- **data**
  - input data, typically **Batting**
- **idvars**
  - ID variables to include in the output data.frame
- **cbind**
  - If TRUE, the calculated statistics are appended to the input data as additional columns

**Details**

Standard calculations, e.g., BA <- H/AB are problematic because of the presence of NAs and zeros. This function tries to deal with those problems.

**Value**

A data.frame with all the observations in data. If cbind==FALSE, only the idvars and the calculated variables are returned.

**Author(s)**

Michael Friendly, Dennis Murphy
See Also

Batting, BattingPost

Examples

```r
bstats <- battingStats()
str(bstats)
bstats <- battingStats(cbind=FALSE)
str(bstats)
```

---

CollegePlaying | CollegePlaying table

Description

Information on schools players attended, by player

Usage

```r
data(CollegePlaying)
```

Format

A data frame with 17350 observations on the following 3 variables.

- `playerID`  Player ID code
- `schoolID`  school ID code
- `yearID`    Year player attended school

Details

This data set reflects a change in the Lahman schema for the 2015 version. The old SchoolsPlayers table was replaced with this new table called CollegePlaying.

According to the documentation, this change reflects advances in the compilation of this data, largely led by Ted Turocy. The old table reported college attendance for major league players by listing a start date and end date. The new version has a separate record for each year that a player attended. This allows us to better account for players who attended multiple colleges or skipped a season, as well as to identify teammates.

Source

Examples

```r
data(CollegePlaying)
head(CollegePlaying)

## Q: What are the top universities for producing MLB players?
SPcount <- table(CollegePlaying$schoolID)
SPcount[SPcount>50]

library("lattice")
dotplot(SPcount[SPcount>50])
dotplot(sort(SPcount[SPcount>50]))

## Q: How many schools are represented in this dataset?
length(table(CollegePlaying$schoolID))

# Histogram of the number of players from each school who played in MLB:
with(CollegePlaying,  
  hist(table(schoolID), xlab = "Number of players",  
       main = ""))
```

Description

Fielding table

Usage

data(Fielding)

Format

A data frame with 149365 observations on the following 18 variables.

- playerID  Player ID code
- yearID  Year
- stint  player’s stint (order of appearances within a season)
- teamID  Team; a factor
- lgID  League; a factor with levels AA AL FL NL PL UA
- POS  Position
- G  Games
- GS  Games Started
- InnOuts  Time played in the field expressed as outs
- PO  Putouts
A Assists  
E Errors  
DP Double Plays  
PB Passed Balls (by catchers)  
WP Wild Pitches (by catchers)  
SB Opponent Stolen Bases (by catchers)  
CS Opponents Caught Stealing (by catchers)  
ZR Zone Rating

Source


Examples

data(Fielding)  
# Basic fielding data  
require("dplyr")

# Roberto Clemente's fielding profile  
# pitching and catching related data removed  
# subset(Fielding, playerID == "clemero01")[, 1:13]  
Fielding %>%  
  filter(playerID == "clemero01") %>%  
  select(1:13)

# Yadier Molina's fielding profile  
# PB, WP, SP and CS apply to catchers  
Fielding %>%  
  subset(playerID == "molinya01") %>%  
  select(-WP, -ZR)

# Pedro Martinez's fielding profile  
Fielding %>% subset(playerID == "martipe02")

# Table of games played by Pete Rose at different positions  
with(subset(Fielding, playerID == "rosepe01"), xtabs(G ~ POS))

# Career total G/PO/A/E/DP for Luis Aparicio  
Fielding %>%  
  filter(playerID == "aparilu01") %>%  
  select(G, PO, A, E, DP) %>%  
  summarise_each(funs(sum))

# Top ten 2B/SS in turning DPs  
Fielding %>%
```r
subset(POS %in% c("2B", "SS")) %>%
group_by(playerID) %>%
summarise(TDP = sum(DP, na.rm = TRUE)) %>%
arrange(desc(TDP)) %>%
head(. , 10)

# League average fielding statistics, 1961-present
Fielding %>%
  filter(yearID >= 1961 & POS != "DH") %>%
  select(yearID, lgID, POS, InnOuts, PO, A, E) %>%
  group_by(yearID, lgID) %>%
  summarise_at(vars(InnOuts, PO, A, E), funs(sum), na.rm = TRUE) %>%
  mutate(fpct = round( (PO + A)/(PO + A + E), 3),
         OPE = round(InnOuts/E, 3))
```

---

**FieldingOF**

**FieldingOF table**

**Description**
Outfield position data: information about positions played in the outfield

**Usage**

data(FieldingOF)

**Format**
A data frame with 12028 observations on the following 6 variables.

- **playerID** Player ID code
- **yearID** Year
- **stint** player’s stint (order of appearances within a season)
- **Glf** Games played in left field
- **Gcf** Games played in center field
- **Grf** Games played in right field

**Source**
Examples

```r
require("dplyr")
require("tidyr")

## Data set only goes through 1955
## Can get a more complete record from the Fielding data frame
## or from the Appearances data (see below)

## Output directly from the FieldingOF data

## Barry Bonds (no records: post-1955 player)
FieldingOF %>%
  filter(playerID == "bondsba01")

## Willie Mays (first few years)
FieldingOF %>%
  filter(playerID == "mayswi01")

## Ty Cobb (complete)
FieldingOF %>%
  filter(playerID == "cobbty01")

## One way to get OF game information from the Fielding data
## Note: OF games != sum(LF, CF, RF) because players can switch
## OF positions within a game. Players can also switch from
## other positions to outfield during a game. OF represents
## the number of games a player started in the outfield.
Fielding %>%
  select(playerID, yearID, stint, POS, G) %>%
  filter(POS %in% c("LF", "CF", "RF", "OF")) %>%
  tidyr::spread(POS, G, fill = 0) %>%
  filter(playerID == "trumbma01")

## Another way is through the Appearances data (no stint).
## Provides a somewhat nicer table than the above.

## Mark Trumbo (active player)
Appearances %>%
  select(playerID, yearID, G_lf, G_cf, G_rf, G_of) %>%
  filter(playerID == "trumbma01")

## A slightly better format, perhaps
Appearances %>%
  select(playerID, yearID, G_lf, G_cf, G_rf, G_of) %>%
  rename(LF = G_lf, CF = G_cf, RF = G_rf, OF = G_of) %>%
  filter(playerID == "trumbma01")

## Willie Mays (1951-1973)
Appearances %>%
  select(playerID, yearID, G_lf, G_cf, G_rf, G_of) %>%
  filter(playerID == "mayswi01")
```
## Joe DiMaggio (1936-1951)

```
## FieldingOFsplit
library(dplyr)
Appearances %>%
  select(playerID, yearID, G_lf, G_cf, G_rf, G_of) %>%
  filter(playerID == "dimagjo01")
```

### FieldingOFsplit table

**Description**

Outfield position data: information about positions played in the outfield

**Usage**

```
data(FieldingOFsplit)
```

**Format**

A data frame with 35315 observations on the following 18 variables.

- `playerID`: Player ID code
- `yearID`: Year
- `stint`: player's stint (order of appearances within a season)
- `teamID`: Team; a factor
- `lgID`: League; a factor with levels AA AL FL NL PL UA
- `POS`: Position
- `G`: Games
- `GS`: Games Started
- `InnOuts`: Time played in the field expressed as outs
- `PO`: Putouts
- `A`: Assists
- `E`: Errors
- `DP`: Double Plays
- `PB`: Passed Balls (by catchers)
- `WP`: Wild Pitches (by catchers)
- `SB`: Opponent Stolen Bases (by catchers)
- `CS`: Opponents Caught Stealing (by catchers)
- `ZR`: Zone Rating

**Source**

## FieldingPost

### Examples

```r
require("dplyr")
require("tidyr")

## Data set starts in 1954
## Can get a more complete record from the Fielding data frame
## or from the Appearances data (see below)

## Output directly from the FieldingOFsplit data

## Joe DiMaggio (no records: pre-1954 player)
FieldingOFsplit %>%
  filter(playerID == "dimagjo01")

## Willie Mays (all but his first few years)
FieldingOF %>%
  filter(playerID == "mayswi01")

## Mike Trout (complete)
FieldingOF %>%
  filter(playerID == "troutmi01")
```

### Description

Post season fielding data

### Usage

```r
data(FieldingPost)
```

### Format

A data frame with 15540 observations on the following 17 variables.

- `playerID`  Player ID code
- `yearID`    Year
- `teamID`    Team; a factor
- `lgID`      League; a factor with levels AL NL
- `round`     Level of playoffs
- `POS`       Position
- `G`         Games
- `GS`        Games Started
- `InnOuts`   Time played in the field expressed as outs
PO Putouts
A Assists
E Errors
DP Double Plays
TP Triple Plays
PB Passed Balls
SB Stolen Bases allowed (by catcher)
CS Caught Stealing (by catcher)

Source

Examples

```r
require("dplyr")

## World Series fielding record for Yogi Berra
FieldingPost %>%
  filter(playerID == "berrayo01" & round == "WS")

## Yogi's career efficiency in throwing out base stealers
## in his WS appearances and CS as a percentage of his
## overall assists
FieldingPost %>%
  filter(playerID == "berrayo01" & round == "WS" & POS == "C") %>%
  summarise(cs_pct = round(100 * sum(CS)/sum(SB + CS), 2),
            cs_assists = round(100 * sum(CS)/sum(A), 2))

## Innings per error for several selected shortstops in the WS
FieldingPost %>%
  filter(playerID %in% c("belanma01", "jeterde01", "campabe01",
                         "conceda01", "bowala01"), round == "WS") %>%
  group_by(playerID) %>%
  summarise(G = sum(G),
            InnOuts = sum(InnOuts),
            Eper9 = round(27 * sum(E)/sum(InnOuts), 3))

## Top 10 center fielders in innings played in the WS
FieldingPost %>%
  filter(POS == "CF" & round == "WS") %>%
  group_by(playerID) %>%
  summarise(inn_total = sum(InnOuts)) %>%
  arrange(desc(inn_total)) %>%
  head(., 10)

## Most total chances by position
FieldingPost %>%
```
`filter(round == "WS" & !(POS %in% c("DH", "OF", "P"))) %>%
group_by(POS, playerID) %>%
summarise(TC = sum(PO + A + E)) %>%
arrange(desc(TC)) %>%
do(head(., 1))  # provides top player by position

---

### HallOfFame  
**Hall of Fame Voting Data**

**Description**

Hall of Fame table. This is composed of the voting results for all candidates nominated for the Baseball Hall of Fame.

**Usage**

```r
data(HallOfFame)
```

**Format**

A data frame with 4323 observations on the following 9 variables.

- **playerID**: Player ID code
- **yearID**: Year of ballot
- **votedBy**: Method by which player was voted upon. See Details
- **ballots**: Total ballots cast in that year
- **needed**: Number of votes needed for selection in that year
- **votes**: Total votes received
- **inducted**: Whether player was inducted by that vote or not (Y or N)
- **category**: Category of candidate; a factor with levels Manager Pioneer/Executive Player Umpire
- **needed_note**: Explanation of qualifiers for special elections

**Details**

This table links to the People table via the playerID.

**votedBy**: Most Hall of Fame inductees have been elected by the Baseball Writers Association of America (BBWAA). Rules for election are described in [https://en.wikipedia.org/wiki/National_Baseball_Hall_of_Fame_and_Museum#Selection_process](https://en.wikipedia.org/wiki/National_Baseball_Hall_of_Fame_and_Museum#Selection_process).

**Source**

Examples

```r
## Some examples for Hall of Fame induction data

require("dplyr")
require("ggplot2")

# What are the different types of HOF voters?
table(HallOfFame$votedBy)

# What was the first year of Hall of Fame elections?
sort(unique(HallOfFame$yearID))[1]

# Who comprised the original class?
subset(HallOfFame, yearID == 1936 & inducted == "Y")

# Result of a player's last year on the BBWAA ballot
# Restrict to players voted by BBWAA:
HOFplayers <- subset(HallOfFame,
                      votedBy == "BBWAA" & category == "Player")

# Number of years as HOF candidate, last pct vote, etc.
# for a given player
playerOutcomes <- HallOfFame %>%
  filter(votedBy == "BBWAA" & category == "Player") %>%
  group_by(playerID) %>%
  mutate(nyears = length(ballots)) %>%
  arrange(yearID) %>%
  do(tail(., 1)) %>%
  mutate(lastPct = 100 * round(votes/ballots, 3)) %>%
  select(playerID, nyears, inducted, lastPct, yearID) %>%
  rename(lastYear = yearID)

# How many voting years until election?
inducted <- subset(playerOutcomes, inducted == "Y")
table(inducted$nyears)

# Bar chart of years to induction for inductees
barplot(table(inducted$nyears),
        main="Number of voting years until election",
        ylab="Number of players", xlab="Years")
box()

# What is the form of this distribution?
require("vcd")
goodfit(inducted$nyears)
plot(goodfit(inducted$nyears), xlab="Number of years",
     main="Poissonness plot of number of years voting until election")
```
Ord_plot(table(inducted$nyears), xlab="Number of years")

# First ballot inductees sorted by vote percentage:
playerOutcomes %>%
  filter(nyears == 1L & inducted == "Y") %>%
  arrange(desc(lastPct))

# Who took at least ten years on the ballot before induction?
playerOutcomes %>%
  filter(nyears >= 10L & inducted == "Y")

###################################################################
## Plots of voting percentages over time for the borderline
## HOF candidates, according to the BBWAA:
# Identify players on the BBWAA ballot for at least 10 years
# Returns a character vector of playerIDs
longTimers <- as.character(unlist(subset(playerOutcomes,
  nyears >= 10, select = "playerID")))

# Extract their information from the HallOfFame data
HOFlt <- HallOfFame %>%
  filter(playerID %in% longTimers & votedBy == "BBWAA") %>%
  group_by(playerID) %>%
  mutate(elected = ifelse(any(inducted == "Y"),
                         "Elected", "Not elected"),
         pct = 100 * round(votes/ballots, 3))

# Plot the voting profiles:
ggplot(HOFlt, aes(x = yearID, y = pct,
                   group = playerID)) +
  ggtitle("Profiles of BBWAA voting percentage, long-time HOF candidates") +
  geom_line() +
  geom_hline(yintercept = 75, colour = "red") +
  labs(x = "Year", y = "Percentage of votes") +
  facet_wrap(~ elected, ncol = 1)

## Eventual inductees tend to have increasing support over time.
## Fit simple linear regression models to each player’s voting
## percentage profile and extract the slopes. Then compare the
## distributions of the slopes in each group.
# data frame for playerID and induction status among
# long term candidates
HOFstatus <- HOFlt %>%
  group_by(playerID) %>%
  select(playerID, elected, inducted) %>%
  do(tail(., 1))

# data frame of regression slopes, which represent average
# increase in percentage support by BBWAA members over a
# player's candidacy.
HOFsslope <- HOFlt %>%
  group_by(playerID) %>%
  do(mod = lm(pct ~ yearID, data = .)) %>%
  do(data.frame(slope = coef(.$mod)[2]))

## Boxplots of regression slopes by induction group
ggplot(data.frame(HOFstatus, HOFsslope),
       aes(x = elected, y = slope)) +
  geom_boxplot(width = 0.5) +
  geom_point(position = position_jitter(width = 0.2))

# Note 1: Only two players whose maximum voting percentage
# was over 60% were not eventually inducted
# into the HOF: Gil Hodges and Jack Morris.
# Red Ruffing was elected in a 1967 runoff election while
# the others have been voted in by the Veterans Committee.

# Note 2: Of the players whose slope was >= 2.5 among
# non-inductees, only Jack Morris has not (yet) been
# subsequently inducted into the HOF; however, his last year of
# eligibility was 2014 so he could be inducted by a future
# Veterans Committee.

---

# HomeGames table

**Description**

Data mapping teams to the stadiums they played regular season games in as the home team.

**Usage**

data(HomeGames)

**Format**

A data frame with 3200 observations on the following 9 variables.

- **year.key** Year
- **league.key** League; a factor with levels AA AL FL NL PL UA
- **team.key** Team; a factor
- **park.key** Unique identifier for each ballpark
- **span.first** First date the park began acting as home field for the team
- **span.last** Last date the park began acting as home field for the team
- **games** Total games in this time span
- **openings** Total opening in this time span
- **attendance** Total attendance in this time span
**Label**

**Extract the Label for a Variable**

**Description**

Extracts the label for a variable from one or more of the *Labels* files. This is useful for plots and other displays because the variable names are often cryptically short.

**Usage**

```r
Label(var, labels = rbind(Lahman::battingLabels,
                           Lahman::pitchingLabels,
                           Lahman::fieldingLabels))
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>var</td>
<td>name of a variable</td>
</tr>
<tr>
<td>labels</td>
<td>label table(s) to search, a 2-column dataframe containing variable names and labels.</td>
</tr>
</tbody>
</table>

**Source**


**Examples**

```r
data(HomeGames)
library(dplyr)

# How many parks has every team played in as the home team for even a single game?
HomeGames %>%
  count(team.key) %>%
  arrange(team.key)

# What parks have the Toronto Blue Jays played in as the home team?
HomeGames %>%
  filter(team.key == "TOR") %>%
  arrange(span.last)

# What parks have the Boston Red Sox played in as the home team?
HomeGames %>%
  filter(team.key == "BOS") %>%
  arrange(span.last)

# What is the Toronto Blue Jays annual total home attendance by year?
HomeGames %>%
  filter(team.key == "TOR") %>%
  group_by(year.key) %>%
  summarize(total.attendance = sum(attendance)) %>%
  arrange(year.key)
```
Value

Returns the variable label, or var if no label is found

Author(s)

Michael Friendly

See Also

battingLabels, pitchingLabels, fieldingLabels

Examples

```r
require("dplyr")
# find and plot maximum number of homers per year
batHR <- Batting %>%
  filter(!is.na(HR)) %>%
  group_by(yearID) %>%
  summarise(max = max(HR))

with(batHR, {
  plot(yearID, max,
   xlab=Label("yearID"), ylab=paste("Maximum", Label("HR")),
   cex=0.8)
  lines(lowess(yearID, max), col="blue", lwd=2)
  abline(lm(max ~ yearID), col="red", lwd=2)
})
```

---

**Lahman Data**

**Lahman Datasets**

**Description**

This dataset gives a concise description of the data files in the Lahman package. It may be useful for computing on the various files.

**Usage**

`data(LahmanData)`

**Format**

A data frame with 24 observations on the following 5 variables.

- `file` name of dataset
- `class` class of dataset
- `nobs` number of observations
- `nvar` number of variables
- `title` dataset title
Details

This dataset is generated using vcdExtra::datasets(package="Lahman") with some post-processing.

Examples

data(LahmanData)

# find ID variables in the datasets
IDvars <- lapply(LahmanData[,"file"], function(x) grep('.*ID$', colnames(get(x)), value=TRUE))
names(IDvars) <- LahmanData[,"file"]
str(IDvars)
# vector of unique ID variables
unique(unlist(IDvars))

# which datasets have playerID?
names(which(sapply(IDvars, function(x) "playerID" %in% x)))

# Visualize relations among datasets via an MDS
# jaccard distance between two sets; assure positivity
jaccard <- function(A, B) {
  max(1 - length(intersect(A,B)) / length(union(A,B)), .00001)
}
distmat <- function(vars, FUN=jaccard) {
  nv <- length(vars)
  d <- matrix(0, nv, nv, dimnames=list(names(vars), names(vars)))
  for(i in 1:nv) {
    for (j in 1:nv) {
      if (i != j) d[i,j] <- FUN(vars[[i]], vars[[j]])
    }
  }
  d[is.nan(d)] = 0
  d
}

# do an MDS on distances
distID <- distmat(IDvars)
config <- cmdscale(distID)
pos=rep(1:4, length=nrow(config))
plot(config[,1], config[,2], xlab = "", ylab = "", asp = 1, axes=FALSE, main="MDS of ID variable distances of Lahman tables")
abline(h=0, v=0, col="gray80")
text(config[,1], config[,2], rownames(config), cex = 0.75, pos=pos, xpd=NA)
Managers table

Description

Managers table: information about individual team managers, teams they managed and some basic statistics for those teams in each year.

Usage

data(Managers)

Format

A data frame with 3718 observations on the following 10 variables.

- playerID  Manager (player) ID code
- yearID    Year
- teamID    Team; a factor
- lgID      League; a factor with levels AA AL FL NL PL UA
- inseason  Managerial order. Zero if the individual managed the team the entire year. Otherwise denotes where the manager appeared in the managerial order (1 for first manager, 2 for second, etc.)
- G         Games managed
- W         Wins
- L         Losses
- rank      Team’s final position in standings that year
- plyrMgr   Player Manager (denoted by ‘Y’); a factor with levels N Y

Source


Examples

####################################
# Basic career summaries by manager
####################################

library("dplyr")
mgrSumm <- Managers %>%
  group_by(playerID) %>%
  summarise(nyear = length(unique(yearID)),
            yearBegin = min(yearID),
            yearEnd = max(yearID),
            playerID, yearID, teamID, lgID)

```r

```
nTeams = length(unique(teamID)),
nfirst = sum(rank == 1L),
W = sum(W),
L = sum(L),
WinPct = round(W/(W + L), 3))

MgrInfo <- People %>%
  filter(!is.na(playerID)) %>%
  select(playerID, nameLast, nameFirst)

# Merge names into the table
mgrTotals <- right_join(MgrInfo, mgrSumm, by = "playerID")

# add total games managed
mgrTotals <- mgrTotals %>%
  mutate(games = W + L)

##########################
# Some basic queries
##########################

# Top 20 managers in terms of years of service:
mgrTotals %>%
  arrange(desc(nyear)) %>%
  head(., 20)

# Top 20 winningest managers (500 games minimum)
mgrTotals %>%
  filter((W + L) >= 500) %>%
  arrange(desc(WinPct)) %>%
  head(., 20)

# Most of these are 19th century managers.
# How about the modern era?
mgrTotals %>%
  filter(yearBegin >= 1901 & (W + L) >= 500) %>%
  arrange(desc(WinPct)) %>%
  head(., 20)

# Top 10 managers in terms of percentage of titles
# (league or divisional) - should bias toward managers
# post-1970 since more first place finishes are available
mgrTotals %>%
  filter(yearBegin >= 1901 & (W + L) >= 500) %>%
  arrange(desc(round(nfirst/nyear, 3))) %>%
  head(., 10)

# How about pre-1969?
mgrTotals %>%
  filter(yearBegin >= 1901 & yearEnd <= 1969 &
         (W + L) >= 500) %>%
  arrange(desc(round(nfirst/nyear, 3))) %>%
  head(., 10)
## Tony LaRussa's managerial record by team

Managers `>%`
filter(playerID == "larusto01") `>%`
group_by(teamID) `>%`
summarise(nyear = length(unique(yearID)),
    yearBegin = min(yearID),
    yearEnd = max(yearID),
    games = sum(G),
    nfirst = sum(rank == 1L),
    W = sum(W),
    L = sum(L),
    WinPct = round(W/(W + L), 3))

`library("ggplot2")`

ggplot(mgrTotals, aes(x = games)) +
    geom_density(fill = "red", alpha = 0.3) +
    labs(x = "Number of games managed")

# Who managed more than 4000 games?

mgrTotals `>%`
filter(W + L >= 4000) `>%`
arrange(desc(W + L))

# Connie Mack's advantage: he owned the Philadelphia A's :)  

# Table of Tony LaRussa's team finishes (rank order):

Managers `>%`
filter(playerID == "larusto01") `>%`
count(rank)

# Scatterplot of winning percentage vs. number of games managed (min 100)

`ggplot(subset(mgrTotals, yearBegin >= 1900 & games >= 100),
    aes(x = games, y = WinPct)) +
    geom_point() + geom_smooth() +
    labs(x = "Number of games managed")`

# Division titles

# Plot of number of first place finishes by managers who
# started in the divisional era (>= 1969) with
# at least 8 years of experience

```r
mgrTotals %>%
  filter(yearBegin >= 1969 & nyear >= 8) %>%
  ggplot(., aes(x = nyear, y = nfirst)) +
  geom_point(position = position_jitter(width = 0.2)) +
  labs(x = "Number of years",
       y = "Number of divisional titles") +
  geom_smooth()
```

# Change response to proportion of titles relative
# to years managed

```r
mgrTotals %>%
  filter(yearBegin >= 1969 & nyear >= 8) %>%
  ggplot(., aes(x = nyear, y = round(nfirst/nyear, 3))) +
  geom_point(position = position_jitter(width = 0.2)) +
  labs(x = "Number of years",
       y = "Proportion of divisional titles") +
  geom_smooth()
```

---

### ManagersHalf

**ManagersHalf table**

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Split season data for managers</td>
<td></td>
</tr>
</tbody>
</table>

**Usage**

```r
data(ManagersHalf)
```

**Format**

A data frame with 93 observations on the following 10 variables.

- `playerID` Manager (player) ID code
- `yearID` Year
- `teamID` Team; a factor
- `lgID` League; a factor with levels AL NL
- `inseason` Managerial order. One if the individual managed the team the entire year. Otherwise denotes where the manager appeared in the managerial order (1 for first manager, 2 for second, etc.). A factor with levels 1 2 3 4 5
- `half` First or second half of season
- `G` Games managed
- `W` Wins
- `L` Losses
- `rank` Team's position in standings for the half
Source


Examples

```r
library("dplyr")
library("reshape2")

# Only have data for 1892 and 1981

# League rank by half for 1981 teams with the same
# manager in both halves who were hired in-season
ManagersHalf %>%
  filter(yearID >= 1901) %>%
  group_by(teamID, yearID) %>%
  filter(all(playerID == playerID[1])) %>% # same manager in both halves
  mutate(winPct = round(W/G, 3)) %>%
  reshape2::dcast(playerID + yearID + teamID + lgID ~ half,
                  value.var = "rank") %>%
  rename(rank1 = `1`, rank2 = `2`)
```

Description

Name and location data for baseball stadiums.

Usage

```r
data(Parks)
```

Format

A data frame with 255 observations on the following 6 variables.

- park.key: unique identifier for each ballpark
- park.name: the name of the ballpark
- park.alias: a semicolon delimited list of other names for the ballpark if they exist
- city: city where the ballpark is located
- state: state where the ballpark is located
- country: country where the ballpark is located

Details

This dataset apparently includes all ballparks that were ever used in baseball. There is no indication of the years they were used, nor the teams that played there.

The ballparks can be associated with teams through the park variable in the Teams table.
People

People table

Description

People table - Player names, DOB, and biographical info. This file is to be used to get details about players listed in the Batting, Pitching, and other files where players are identified only by playerID.

Usage

data(People)
People

Format

A data frame with 20370 observations on the following 26 variables.

playerID  A unique code assigned to each player. The playerID links the data in this file with
records on players in the other files.
birthYear  Year player was born
birthMonth  Month player was born
birthDay  Day player was born
birthCountry  Country where player was born
birthState  State where player was born
birthCity  City where player was born
deathYear  Year player died
deathMonth  Month player died
deathDay  Day player died
deathCountry  Country where player died
deathState  State where player died
deathCity  City where player died
nameFirst  Player's first name
nameLast  Player's last name
nameGiven  Player's given name (typically first and middle)
weight  Player's weight in pounds
height  Player's height in inches
bats  a factor: Player's batting hand (left (L), right (R), or both (B))
throws  a factor: Player's throwing hand (left(L) or right(R))
debut  Date that player made first major league appearance
finalGame  Date that player made first major league appearance (blank if still active)
retroID  ID used by retrosheet, https://www.retrosheet.org/
bbrefID  ID used by Baseball Reference website, https://www.baseball-reference.com/
birthDate  Player's birthdate, in as.Date format
deathDate  Player's deathdate, in as.Date format

Details

debut, finalGame were converted from character strings with as.Date.

Source

Examples

data(People); data(Batting)

## add player's name to Batting data
People$name <- paste(People$nameFirst, People$nameLast, sep=" ")
batting <- merge(Batting,
  People[,c("playerID","name")],
  by="playerID", all.x=TRUE)

## batting and throwing
# right-handed batters are much less ambidexterous in throwing than left-handed batters
# (should only include batters)
BT <- with(People, table(bats, throws))
require(vcd)
structable(BT)
mosaic(BT, shade=TRUE)

## Who is Shoeless Joe Jackson?
subset(People, nameLast=="Jackson" & nameFirst=="Joe")
subset(People, nameLast=="Jackson" & nameFirst=="Shoeless Joe")

joeID <-c(subset(People, nameLast=="Jackson" & nameFirst=="Shoeless Joe")["playerID"])

subset(Batting, playerID==joeID)
subset(Fielding, playerID==joeID)

---

Pitching

Description

Pitching table

Usage

data(Pitching)

Format

A data frame with 50402 observations on the following 30 variables.

playerID  Player ID code
yearID    Year
stint     player's stint (order of appearances within a season)
teamID    Team; a factor
lgID      League; a factor with levels AA AL FL NL PL UA
W         Wins
Pitching

L  Losses
G  Games
GS  Games Started
CG  Complete Games
SHO  Shutouts
SV  Saves
IPouts  Outs Pitched (innings pitched x 3)
H  Hits
ER  Earned Runs
HR  Homeruns
BB  Walks
SO  Strikeouts
BAOpp  Opponent’s Batting Average
ERA  Earned Run Average
IBB  Intentional Walks
WP  Wild Pitches
HBP  Batters Hit By Pitch
BK  Balks
BFP  Batters faced by Pitcher
GF  Games Finished
R  Runs Allowed
SH  Sacrifices by opposing batters
SF  Sacrifice flies by opposing batters
GIDP  Grounded into double plays by opposing batter

Source

Examples
# Pitching data
require("dplyr")

# Cleanup, add some other stats

# Restrict to AL and NL data, 1901+
# All data re SH, SF and GIDP are missing, so remove
# Intentional walks (IBB) not recorded until 1955
pitching <- Pitching %>%
  filter(yearID >= 1901 & lgID %in% c("AL", "NL")) %>%
  select(-(-28:30)) %>%  # remove SH, SF, GIDP
  mutate(BAOpp = round(H/(H + IPouts), 3),  # loose def' n
    WHIP = round((H + BB) * 3/IPouts, 2),
    KperBB = round(ifelse(yearID >= 1955,
                          SO/(BB - IBB), SO/BB), 2))

# some simple queries

# Team pitching statistics, Toronto Blue Jays, 1993
tor93 <- pitching %>%
  filter(yearID == 1993 & teamID == "TOR") %>%
  arrange(ERA)

# Career pitching statistics, Greg Maddux
subset(pitching, playerID == "maddugr01")

# Best ERAs for starting pitchers post WWII
pitching %>%
  filter(yearID >= 1946 & IPouts >= 600) %>%
  group_by(lgID) %>%
  arrange(ERA) %>%
  do(head(., 5))

# Best K/BB ratios post-1955 among starters (excludes intentional walks)
pitching %>%
  filter(yearID >= 1955 & IPouts >= 600) %>%
  mutate(KperBB = SO/(BB - IBB)) %>%
  arrange(desc(KperBB)) %>%
  head(., 10)

# Best K/BB ratios among relievers post-1950 (min. 20 saves)
pitching %>%
  filter(yearID >= 1950 & SV >= 20) %>%
  arrange(desc(KperBB)) %>%
  head(., 10)

# Winningest pitchers in each league each year:

# Add name & throws information:
peopleInfo <- People %>%
  select(playerID, nameLast, nameFirst, throws)

# Merge peopleInfo into the pitching data
pitching1 <- right_join(peopleInfo, pitching, by = "playerID")
# Extract the pitcher with the maximum number of wins
# each year, by league
winp <- pitching1
  %>%
  group_by(yearID, lgID)
  %>%
  filter(W == max(W))
  %>%
  select(nameLast, nameFirst, teamID, W, throws)

# A simple ANCOVA model of wins vs. year, league and hand (L/R)
anova(lm(formula = W ~ yearID + I(yearID^2) + lgID + throws, data = winp))

# Nature of managing pitching staffs has altered importance of
# wins over time
## Not run:
require("ggplot2")

# compare loess smooth with quadratic fit
ggplot(winp, aes(x = yearID, y = W)) +
  geom_point(aes(colour = throws, shape=lgID), size = 2) +
  geom_smooth(method="loess", size=1.5, color="blue") +
  geom_smooth(method = "lm", se=FALSE, color="black",
              formula = y ~ poly(x,2)) +
  ylab("League maximum Wins") + xlab("Year") +
  ggtitle("Maximum pitcher wins by year")

## To reinforce this, plot the mean IPouts by year and league,
## which gives some idea of pitcher usage. Restrict pitcher
## pool to those who pitched at least 100 innings in a year.
pitching %>% filter(IPouts >= 300) %>% # >= 100 IP

  ggplot(., aes(x = yearID, y = IPouts, color = lgID)) +
  geom_smooth(method="loess") +
  labs(x = "Year", y = "IPouts")

## Another indicator: total number of complete games pitched
## (Mirrors the trend from the preceding plot.)
pitching %>%
  group_by(yearID, lgID)
  %>%
  summarise(totalCG = sum(CG, na.rm = TRUE))
  %>%
  ggplot(., aes(x = yearID, y = totalCG, color = lgID)) +
  geom_point() +
  geom_path() +
  labs(x = "Year", y = "Number of complete games")

## End(Not run)
Description

Post season pitching statistics

Usage

data(PitchingPost)

Format

A data frame with 6538 observations on the following 30 variables.

playerID  Player ID code
yearID  Year
round  Level of playoffs
teamID  Team; a factor
lgID  League; a factor with levels AA AL NL
W  Wins
L  Losses
G  Games
GS  Games Started
CG  Complete Games
SHO  Shutouts
SV  Saves
IPouts  Outs Pitched (innings pitched x 3)
H  Hits
ER  Earned Runs
HR  Homeruns
BB  Walks
SO  Strikeouts
BAOpp  Opponents’ batting average
ERA  Earned Run Average
IBB  Intentional Walks
WP  Wild Pitches
HBP  Batters Hit By Pitch
BK  Balks
BFP  Batters faced by Pitcher
GF  Games Finished
R  Runs Allowed
SH  Sacrifice Hits allowed
SF  Sacrifice Flies allowed
GIDP  Grounded into Double Plays
Examples

library("dplyr")
library(ggplot2)

# Restrict data to World Series in modern era
ws <- PitchingPost %>%
  filter(yearID >= 1903 & round == "WS")
# Pitchers with ERA 0.00 in WS play (> 10 IP)
ws %>%
  filter(IPouts > 30 & ERA == 0.00) %>%
  arrange(desc(IPouts)) %>%
  select(playerID, yearID, teamID, lgID, IPouts, W, L, G,
         CG, SHO, H, R, SO, BFP)

# Pitchers with the most IP in a series
# 1903 Series went eight games - for details, see
# https://en.wikipedia.org/wiki/1903_World_Series
ws %>%
  arrange(desc(IPouts)) %>%
  select(playerID, yearID, teamID, lgID, IPouts, W, L, G,
         CG, SHO, H, SO, BFP, ERA) %>%
  head(., 10)

# Pitchers with highest strikeout rate in WS
# (minimum 20 IP)
ws %>%
  filter(IPouts >= 60) %>%
  mutate(K_rate = 27 * SO/IPouts) %>%
  arrange(desc(K_rate)) %>%
  select(playerID, yearID, teamID, lgID, IPouts, H, SO, K_rate) %>%
  head(., 10)

# Pitchers with the most IP in WS history
ws %>%
  group_by(playerID) %>%
  summarise_at(vars(IPouts, H, ER, CG, BB, SO, W, L),
               sum, na.rm = TRUE) %>%
  mutate(ERA = round(27 * ER/IPouts, 2),
         Kper9 = round(27 * SO/IPouts, 3),
         WHIP = round(3 * (H + BB)/IPouts, 3)) %>%
  arrange(desc(IPouts)) %>%
  select(-H, -ER) %>%
  head(., 10)

# Plot of K/9 by year
ws %>%
group_by(yearID) %>%
  summarise(Kper9 = 27 * sum(SO)/sum(IPouts)) %>%
ggplot(. , aes(x = yearID, y = Kper9)) +
  geom_point() +
  geom_smooth() +
  labs(x = "Year", y = "K per 9 innings")

---

**playerInfo**

*Lookup Information for Players and Teams*

**Description**

These functions use `grep` to lookup information about players (from the `People` file) and teams (from the `Teams` file).

**Usage**

```r
playerInfo(playerID, nameFirst, nameLast, data = Lahman::People, extra = NULL, ...)

teamInfo(teamID, name, data = Lahman::Teams, extra = NULL, ...)
```

**Arguments**

- `playerID`  pattern for `playerID`
- `nameFirst`  pattern for first name
- `nameLast`  pattern for last name
- `data`  The name of the dataset to search
- `extra`  A character vector of other fields to include in the result
- `...`  other arguments passed to `grep`
- `teamID`  pattern for `teamID`
- `name`  pattern for team name

**Value**

Returns a data frame for unique matching rows from `data`

**Author(s)**

Michael Friendly

**See Also**

`grep`, `~~~`
**Salaries**

**Examples**

```r
playerInfo("aaron")

teamInfo("CH", extra="park")
```

---

**Description**

Player salary data.

**Usage**

data(Salaries)

**Format**

A data frame with 26428 observations on the following 5 variables.

- `yearID` Year
- `teamID` Team; a factor
- `lgID` League; a factor
- `playerID` Player ID code
- `salary` Salary

**Details**

There is no real coverage of player's salaries until 1985.

**Source**


**Examples**

```r
# what years are included?
summary(Salaries$yearID)

# how many players included each year?
table(Salaries$yearID)

# Team salary data
require("dplyr")
require("ggplot2")
```
# Total team salaries by league, team and year

```r
teamSalaries <- Salaries %>%
  group_by(lgID, teamID, yearID) %>%
  summarise(Salary = sum(as.numeric(salary))) %>%
  group_by(yearID, lgID) %>%
  arrange(desc(Salary))
```

# Highest paid players each year:
```r
maxSal <- Salaries %>%
  group_by(yearID) %>%
  filter(salary == max(salary))
maxPlayers <- bind_rows(lapply(maxSal$playerID, playerInfo)) %>%
  select(-playerID)
maxSal <- bind_cols(maxPlayers, maxSal)
```

# Plot maximum MLB salary by year (1985-present)
```r
ggplot(maxSal, aes(x = yearID, y = salary/1e6)) +
  geom_point() +
  geom_smooth(se = FALSE) +
  labs(x = "Year", y = "Salary (millions)")
```

# Plot salary distributions by year for all players
```r
ggplot(Salaries, aes(x = factor(yearID), y = salary/1e5)) +
  geom_boxplot(fill = "lightblue", outlier.size = 1) +
  labs(x = "Year", y = "Salary ($100,000)") +
  coord_flip()
```

# Plot median MLB salary per year
```r
Salaries %>%
  group_by(yearID) %>%
  summarise(medsal = median(salary)) %>%
  ggplot(. , aes(x = yearID, y = medsal/1e6)) +
  geom_point() +
  geom_smooth() +
  labs(x = "Year", y = "Median MLB salary (millions)")
```

# add salary to Batting data
```r
batting <- Batting %>%
  filter(yearID >= 1985) %>%
  left_join(select(Salaries, playerID, yearID, teamID, salary),
            by=c("playerID", "yearID", "teamID"))
str(batting)
```

# Average salaries by teams, over years

# Some franchises are multiply named, so add a new variable
# 'franchise' to the Salaries data as a lookup table
```r
franchise <- c(`ANA` = "LAA", `ARI` = "ARI", `ATL` = "ATL",
               `BAL` = "BAL", `BOS` = "BOS", `CAL` = "LAA",
               ...)
```
```
`CHA` = "CHA", `CHN` = "CHN", `CIN` = "CIN",
`CLE` = "CLE", `COL` = "COL", `DET` = "DET",
`FLO` = "MIA", `HOU` = "HOU", `KCA` = "KCA",
`LAA` = "LAA", `LAN` = "LAN", `MIA` = "MIA",
`MIL` = "MIL", `MIN` = "MIN", `MLA` = "MLA",
`MON` = "WAS", `NYA` = "NYA", `NYM` = "NYN",
`NYN` = "NYN", `OAK` = "OAK", `PHI` = "PHI",
`PIT` = "PIT", `SDN` = "SDN", `SEA` = "SEA",
`SFG` = "SFN", `SFN` = "SFN", `SLN` = "SLN",
`tBA` = "TBA", `TEX` = "TEX", `TOR` = "TOR",
`WAS` = "WAS"
```

Salaries$franchise <- unname(franchise[Salaries$teamID])

# Average salaries annual salaries by team, in millions USD
avg_team_salaries <- Salaries %>%
  group_by(yearID, franchise, lgID) %>%
  summarise(salary = mean(salary)/1e6) %>%
  filter(!(franchise == "CLE" & lgID == "NL"))

# Spaghetti plot of team salary over time by team
# Yankees have largest average team salary since 2003
ggplot(avg_team_salaries,
  aes(x = yearID, y = salary, group = factor(franchise))) +
  geom_path() +
  labs(x = "Year", y = "Average team salary (millions USD)"
)

---

**Schools**

**Schools table**

**Description**

Information on schools players attended, by school

**Usage**

data(Schools)

**Format**

A data frame with 1207 observations on the following 5 variables.

- schoolID  school ID code
- name_full  school name
- city  city where school is located
- state  state where school’s city is located
- country  country where school is located
Source

Examples

```r
require("dplyr")

# How many different schools are listed in each state?
table(Schools$state)

# How many different schools are listed in each country?
table(Schools$country)

# Top 20 schools
schoolInfo <- Schools %>% select(-country)

schoolCount <- CollegePlaying %>%
  group_by(schoolID) %>%
  summarise(players = length(schoolID)) %>%
  left_join(schoolInfo, by = "schoolID") %>%
  arrange(desc(players))

head(schoolCount, 20)

# sum counts by state
schoolStates <- schoolCount %>%
  group_by(state) %>%
  summarise(players = sum(players),
            schools = length(state))

str(schoolStates)
summary(schoolStates)
```

---

SeriesPost  SeriesPost table

Description
Post season series information

Usage
data(SeriesPost)

Format
A data frame with 378 observations on the following 9 variables.

yearID Year
SeriesPost

round  Level of playoffs
teamIDwinner  Team ID of the team that won the series; a factor
lgIDwinner  League ID of the team that won the series; a factor with levels AL NL
teamIDloser  Team ID of the team that lost the series; a factor
lgIDloser  League ID of the team that lost the series; a factor with levels AL NL
wins  Wins by team that won the series
losses  Losses by team that won the series
ties  Tie games

Source


Examples

data(SeriesPost)

# How many times has each team won the World Series?
#
# Notes:
# - the SeriesPost table includes an identifier for the
# team (teamID), but not the franchise (e.g. the Brooklyn Dodgers
# [BRO] and Los Angeles Dodgers [LAN] are counted separately)
# - the World Series was first played in 1903, but the
# Lahman data tables have the final round of the earlier
# playoffs labelled "WS", so it is necessary to
# filter the SeriesPost table to exclude years prior to 1903.
#
# using the dplyr data manipulation package
library("dplyr")
library("tidyr")
library("ggplot2")

## WS winners, arranged in descending order of titles won
ws_winner_table <- SeriesPost %>%
  filter(yearID > "1902", round == "WS") %>%
  group_by(teamIDwinner) %>%
  summarise(wincount = n()) %>%
  arrange(desc(wincount))
ws_winner_table

## Expanded form of World Series team data in modern era

ws <- SeriesPost %>%
  filter(yearID >= 1903 & round == "WS") %>%
  select(-ties, -round) %>%
  mutate(lgIDloser = droplevels(lgIDloser),
         lgIDwinner = droplevels(lgIDwinner))
Teams

Teams table

Description

Yearly statistics and standings for teams
**Teams**

**Usage**

`data(Teams)`

**Format**

A data frame with 3015 observations on the following 48 variables.

- `yearID` Year
- `lgID` League; a factor with levels AA AL FL NL PL UA
- `teamID` Team; a factor
- `franchID` Franchise (links to `TeamsFranchises` table)
- `divID` Team’s division; a factor with levels C E W
- `Rank` Position in final standings
- `G` Games played
- `Ghome` Games played at home
- `W` Wins
- `L` Losses
- `DivWin` Division Winner (Y or N)
- `WCWin` Wild Card Winner (Y or N)
- `LgWin` League Champion (Y or N)
- `WSWin` World Series Winner (Y or N)
- `R` Runs scored
- `AB` At bats
- `H` Hits by batters
- `X2B` Doubles
- `X3B` Triples
- `HR` Homeruns by batters
- `BB` Walks by batters
- `SO` Strikeouts by batters
- `SB` Stolen bases
- `CS` Caught stealing
- `HBP` Batters hit by pitch
- `SF` Sacrifice flies
- `RA` Opponents runs scored
- `ER` Earned runs allowed
- `ERA` Earned run average
- `CG` Complete games
- `SHO` Shutouts
- `SV` Saves
IPouts  Outs Pitched (innings pitched x 3)
HA  Hits allowed
HRA  Homeruns allowed
BBA  Walks allowed
SOA  Strikeouts by pitchers
E  Errors
DP  Double Plays
FP  Fielding percentage
name  Team's full name
park  Name of team's home ballpark
attendance  Home attendance total
BPF  Three-year park factor for batters
PPF  Three-year park factor for pitchers
teamIDBR  Team ID used by Baseball Reference website
teamIDlahman45  Team ID used in Lahman database version 4.5
teamIDretro  Team ID used by Retrosheet

Details

Variables X2B and X3B are named 2B and 3B in the original database

Source


Examples

data(Teams)
library("dplyr")
library("tidyr")

# Add some selected measures to the Teams data frame
# Restrict to AL and NL in modern era
teams <- Teams %>%
  filter(yearID >= 1901 & lgID %in% c("AL", "NL")) %>%
group_by(yearID, teamID) %>%
mutate(TB = H + X2B + 2 * X3B + 3 * HR,
    WinPct = W/G,
    rpg = R/G,
    hrpg = HR/G,
    tbpg = TB/G,
    kpg = SO/G,
    k2bb = SO/BB,
    whip = 3 * (H + BB)/IPouts)
# Function to create a ggplot by year for selected team stats
# Both arguments are character strings
yrPlot <- function(yvar, label)
{
  require("ggplot2")
  ggplot(teams, aes_string(x = "yearID", y = yvar)) +
    geom_point(size = 0.5) +
    geom_smooth(method="loess") +
    labs(x = "Year", y = paste(label, " per game"))
}

## Run scoring in the modern era by year
yrPlot("rpg", "Runs")

## Home runs per game by year
yrPlot("hrpg", "Home runs")

## Total bases per game by year
yrPlot("tbpg", "Total bases")

## Strikeouts per game by year
yrPlot("kpg", "Strikeouts")

## Plot win percentage vs. run differential (R - RA)
ggplot(teams, aes(x = R - RA, y = WinPct)) +
  geom_point(size = 0.5) +
  geom_smooth(method="loess") +
  geom_hline(yintercept = 0.5, color = "orange") +
  geom_vline(xintercept = 0, color = "orange") +
  labs(x = "Run differential", y = "Win percentage")

## Plot attendance vs. win percentage by league, post-1980
teams %>% filter(yearID >= 1980) %>%
ggplot(., aes(x = WinPct, y = attendance/1000)) +
  geom_point(size = 0.5) +
  geom_smooth(method="loess", se = FALSE) +
  facet_wrap(~ lgID) +
  labs(x = "Win percentage", y = "Attendance (1000s)")

## Teams with over 4 million attendance in a season
teams %>%
  filter(attendance >= 4e6) %>%
  select(yearID, lgID, teamID, Rank, attendance) %>%
  arrange(desc(attendance))

## Average season HRs by park, post-1980
teams %>%
  filter(yearID >= 1980) %>%
  group_by(park) %>%
  summarise(meanHRpg = mean((HR + HRA)/Ghome), nyears = n()) %>%
  filter(nyears >= 10) %>%
  arrange(desc(meanHRpg)) %>%
  head(., 10)
Teams

## Home runs per game at Fenway Park and Wrigley Field, the two oldest MLB parks, by year. Fenway opened in 1912.
```r
teams %>%
  filter(yearID >= 1912 & teamID %in% c("BOS", "CHN")) %>%
  mutate(hrpg = (HR + HRA)/Ghome) %>%
  ggplot(., aes(x = yearID, y = hrpg, color = teamID)) +
    geom_line(size = 1) +
    geom_point() +
    labs(x = "Year", y = "Home runs per game", color = "Team") +
    scale_color_manual(values = c("red", "blue"))
```

## Ditto for total strikeouts per game
```r
teams %>%
  filter(yearID >= 1912 & teamID %in% c("BOS", "CHN")) %>%
  mutate(kpg = (SO + SOA)/Ghome) %>%
  ggplot(., aes(x = yearID, y = kpg, color = teamID)) +
    geom_line(size = 1) +
    geom_point() +
    labs(x = "Year", y = "Strikeouts per game", color = "Team") +
    scale_color_manual(values = c("red", "blue"))
```

## Not run:
```r
if(require(googleVis)) {
  motion1 <- gvisMotionChart(as.data.frame(teams),
    idvar="teamID", timevar="yearID", chartid="gvisTeams",
    options=list(width=700, height=600))
  plot(motion1)
  #print(motion1, file="gvisTeams.html")

  # Merge with avg salary for years where salary is available
  teamsal <- Salaries %>%
    group_by(yearID, teamID) %>%
    summarise(Salary = sum(salary, na.rm = TRUE)) %>%
    select(yearID, teamID, Salary)
  teamsSal <- teams %>%
    filter(yearID >= 1985) %>%
    left_join(teamsal, by = c("yearID", "teamID")) %>%
    select(yearID, teamID, attendance, Salary, WinPct) %>%
    as.data.frame(.)

  motion2 <- gvisMotionChart(teamsSal, idvar="teamID", timevar="yearID",
    xvar="attendance", yvar="salary", sizevar="WinPct",
    chartid="gvisTeamsSal", options=list(width=700, height=600))
  plot(motion2)
  #print(motion2, file="gvisTeamsSal.html")
}
```

## End(Not run)
Description

Information about team franchises

Usage

data(TeamsFranchises)

Format

A data frame with 120 observations on the following 4 variables.

- franchID  Franchise ID; a factor
- franchName  Franchise name
- active  Whether team is currently active (Y or N)
- NAassoc  ID of National Association team franchise played as

Source


Examples

data(TeamsFranchises)

# Which of the active Major League Baseball teams had a National Association predecessor?

# Notes:
# - the National Association was founded in 1871, and continued through the
# 1875 season. In 1876, six clubs from the National Association and two other
# independent clubs formed the National League, which exists to this day.
# - the 'active' field has "NA" for the National Association franchises
# - where appropriate, the 'NAassoc' field has the 'franchID' of the successor National League team

# using the dplyr data manipulation package
library("dplyr")

NatAssoc_active_table <- TeamsFranchises %>%
  filter(active == "Y") %>%
  filter(!is.na(NAassoc))
NatAssoc_active_table

# Merge current team IDs with franchise IDs
currentTeams <- Teams %>%
  filter(yearID == 2014) %>%
select(teamID, franchID, lgID, park)

# Merge TeamsFranchises with currentTeams
TeamsFranchises %>%
  filter(active == "Y") %>%
  select(-active, -NAassoc) %>%
  left_join(currentTeams, by = "franchID")

<table>
<thead>
<tr>
<th>TeamsHalf</th>
<th>TeamsHalf table</th>
</tr>
</thead>
</table>

**Description**

Split season data for teams

**Usage**

data(TeamsHalf)

**Format**

A data frame with 52 observations on the following 10 variables.

- **yearID**: Year
- **lgID**: League; a factor with levels AL NL
- **teamID**: Team; a factor
- **Half**: First or second half of season
- **divID**: Division
- **DivWin**: Won Division (Y or N)
- **Rank**: Team's position in standings for the half
- **G**: Games played
- **W**: Wins
- **L**: Losses

**Source**

Examples

```r
# 1981 season team data split into half seasons
data(TeamsHalf)

library("dplyr")

# List standings with winning percentages by
# season half, league and division
TeamsHalf %>%
  group_by(Half, lgID, divID) %>%
  mutate(WinPct = round(W/G, 3)) %>%
  arrange(Half, lgID, divID, Rank) %>%
  select(Half, lgID, divID, Rank, teamID, WinPct)
```
Index

* datasets
  AllstarFull, 5
  Appearances, 6
  AwardsManagers, 8
  AwardsPlayers, 10
  AwardsShareManagers, 11
  AwardsSharePlayers, 12
  Batting, 14
  battingLabels, 18
  BattingPost, 19
  CollegePlaying, 22
  Fielding, 23
  FieldingOF, 25
  FieldingOFsplit, 27
  FieldingPost, 28
  HallOfFame, 30
  HomeGames, 33
  LahmanData, 35
  Managers, 37
  ManagersHalf, 40
  Parks, 41
  People, 42
  Pitching, 44
  PitchingPost, 47
  Salaries, 51
  Schools, 53
  SeriesPost, 54
  Teams, 56
  TeamsFranchises, 61
  TeamsHalf, 62

* manip
  battingStats, 21
  Label, 34
  playerInfo, 50

AllstarFull, 4, 5
Appearances, 4, 6
AwardsManagers, 4, 8
AwardsPlayers, 4, 10
AwardsShareManagers, 4, 11
AwardsSharePlayers, 4, 12
Baseball, 15
baseball, 15
Batting, 3, 14, 18, 21, 22, 42
battingLabels, 4, 18, 35
BattingPost, 4, 19, 22
battingStats, 15, 21
CollegePlaying, 4, 22
Fielding, 3, 18, 23
fieldingLabels, 4, 35
fieldingLabels (battingLabels), 18
FieldingOF, 4, 25
FieldingOFsplit, 27
FieldingPost, 4, 28
grep, 50
HallOfFame, 4, 30
HomeGames, 33
Label, 18, 34
Lahman (Lahman-package), 3
Lahman-package, 3
LahmanData, 35
Managers, 4, 37
ManagersHalf, 4, 40
Parks, 41
People, 3, 30, 42, 50
Pitching, 3, 18, 42, 44
pitchingLabels, 4, 35
pitchingLabels (battingLabels), 18
PitchingPost, 4, 47
playerInfo, 50
Salaries, 4, 51
Schools, 4, 53
INDEX

SeriesPost, 4, 54

teamInfo (playerInfo), 50

Teams, 4, 41, 42, 50, 56

TeamsFranchises, 4, 57, 61

TeamsHalf, 4, 62