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Examine the Data

Reflect on the Question

Analyze the Data

Draw Conclusions

Lab 4: Track and Field World Records



Every four years, track and field athletes take the world stage at the Summer Olympics. Some of the most exciting events during each Olympics are those in which athletes push the limits of their sport, breaking their own personal best records, national records, or even world records. We have compiled the world record times for track events like the 100m dash and record distances for field events like the shotput into a

single dataset. This dataset includes information on the person who broke the record, his/her nationality, where the record was broken, and the year it was broken. Note that not all world records are broken during the Olympics, with many occurring in regional or national competitions.

Primary Research Question

How has the men's shotput world record changed over time? What about the women's world record?

problem

3/3 points (graded)

Check the Data

Let's begin by examining our data in R.

1. Open RStudio. Make sure you've installed the **current version** of the SDSFoundations package.
2. Type `library(SDSFoundations)` This will automatically load the data for the labs.
3. Type `WR <- WorldRecords` This will assign the data to your Workspace.
4. Look at the spreadsheet view of the data to answer the following questions.

Alternatively, you can use follow the steps in the "Importing a Data Frame" R tutorial video, and use the [WorldRecords.csv](#) file. (Right-click and "Save As.") Make sure to **name** the dataframe "WR" when importing.

1. Open RStudio.
2. Click on "Import Dataset" button at the top of the workspace window.

Choose *"from text file."*

3. Click on the location of the WorldRecords.csv file you just downloaded.
4. Click on the WorldRecords.csv file. Then, click Upload.
5. Look at the spreadsheet view of the data to answer the following questions.

1a. How many different types of events (e.g. "Mens 100m," "Womens shotput," etc.) are represented in the dataset?



1b. In what year did Usain Bolt first break the world record for the men's 100m dash?



1c. Who was the first woman to break the women's 1 mile world record with a time of less than 260 seconds?



You have used 1 of 1 attempt

✓ Correct (3/3 points)

problem

4/4 points (graded)

Check the Variables of Interest

Let's find the variables we need to answer the question.

2a. Which variable tells us the record setting time or distance? The variable name in the dataset is:

Record ▼



2b. What type of variable is this?

Quantitative ▼



2c. Which variable tells us when the record was broken? The variable name in the dataset is:

Year ▼



2d. What type of variable is this?

Quantitative ▼



Submit

You have used 1 of 1 attempt

✓ Correct (4/4 points)

problem

2/2 points (graded)

Reflect on the Method

Which method should we be using for this analysis and why?

3. For each sex, we will begin our analysis by generating a **scatterplot** of shotput distance and year. Why?

- ☐ The scatterplot will show us how many athletes broke the shotput world record.
- ☐ The scatterplot will show us how much the men's and the women's records differ.
- ☒ The scatterplot will show us if these two numeric variables are linearly related. ✓

4. What will we be able to determine once we fit a **linear model** to this shotput world record data?

- ☒ We will be able to report the average rate of change in world record shotput distance per year. ✓
- ☐ We can determine if men throw a shotput significantly farther than women ever will.
- ☐ We can say how often the world record for men and women's shotput is broken.

Submit

You have used 1 of 1 attempt

✓ Correct (2/2 points)