Primary Research Question

How have the world record times for the men's and the women's mile event changed over the years?

Analysis

Let's break this question down into the different descriptive statistics that you will need to construct your answer. Be sure that your R output includes all of the following components.

1. Create a subset of the data that contains World Record cases for the men's Mile event.
2. Create a subset of the data that contains World Record cases for the women's Mile event.
3. Create a scatterplot for each relationship of Mile time and year: one for men and one for women.
4. Confirm from these plots that a linear model is appropriate.
5. Run a linear model for each event and then interpret the results. Be sure to calculate R-squared values for each model.

(1 point possible)

1. Which scatterplot shows a **stronger** linear relationship between World Record times in the Mile and Year:

Women's ✖ **Answer:** Men's

You have used 1 of 1 submissions

2. On average, how many *seconds* do men trim off the world record time in the Mile each year? *(Round to three decimal places)*

Lecture Videos
Comprehension Check due Mar 15, 2016 at 18:00 UTC

R Tutorial Videos

Pre-Lab
Pre-Lab due Mar 15, 2016 at 18:00 UTC

Lab
Lab due Mar 15, 2016 at 18:00 UTC

Problem Set
Problem Set due Mar 15, 2016 at 18:00 UT

-0.39347 ✖ **Answer:** 0.393

-0.39347

You have used 1 of 1 submissions

(1/1 point)

3. On average, how many *seconds* do women trim off the world record time in the Mile each year? *(Round to three decimal places)*

0.973 ✔ **Answer:** 0.973

0.973

You have used 1 of 1 submissions

(1/1 point)

4. How many **years** would you predict it would take for the men's mile record to decrease by one full second? Use the model equation to help you answer the question.

- About 18 years
- About 2.5 years ✔
- About 3.5 years
- About 4 years

You have used 1 of 1 submissions

(1/1 point)

5. How many **years** would you predict it would take for the women's mile record to decrease by one full second? Use the model equation to help you answer the question.

- About 8 years
- About 4.5 years

- About 2 years
- About 1 year ✔

You have used 1 of 1 submissions

(1/1 point)

6. What proportion of variance in the men's World Record times in the Mile can be explained by year? *(Round to three decimal places)*

0.977 ✔ **Answer:** 0.977

0.977

You have used 1 of 1 submissions

(1/1 point)

7. What proportion of the variance in women's World Record times in the Mile can be explained by year? *(Round to three decimal places)*

0.896 ✔ **Answer:** 0.896

0.896

You have used 1 of 1 submissions

(1/1 point)

8. Which of the following is a reasonable conclusion to draw from this analysis?

- A linear model is a good fit for describing the decrease in record time for the Mile for men, but not for women.
- We cannot fit a linear model to either the men's or the women's mile.
- World record times in the Mile have decreased linearly over the last several decades for both men and women. ✔

You have used 1 of 1 submissions