Inspecting Data and Objects in R

Your Name Here!

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Importing Data

```r
library(mosaicData)
births <- Births
```

Structure of Data

Write commands to:

1. Display the first 6 rows and the last 6 rows
2. Output the dimension of the dataset, with and without NA’s
3. Display the unique years in the dataset

```r
## Your commands here!
```

Changing Data Type

Write commands to:

1. Determine the class that weekday is in the births dataset
2. Determine the order of the levels of weekday in the births dataset
3. Reorder the levels of weekday to be Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday.

```r
## Your commands here!
```

Statistical Models

You should be familiar with fitting a variety of statistical tests by now (t-test, Welch’s t-test, one-way ANOVA, etc.). Fit the following models:

1. A parametric one-way ANOVA using the `aov` function of the relationship between births and weekdays
2. A linear model of the relationship between births and weekdays
3. A parametric one-way ANOVA using the `anova` function of your linear model
4. A Tukey’s HSD comparison of all possible combinations of differences in mean births by weekday (using the `TukeyHSD` function)

```r
## Your statistical models here!
```
Inspecting Model Objects

With the \texttt{aov} model object:

1. Output the summary
2. Determine what objects are nested within the \texttt{aov} model object
3. Extract the residual degrees of freedom from the \texttt{aov} model object
4. Determine what objects are nested within the \texttt{summary} of the \texttt{aov} model object
5. How does the \texttt{aov} object differ from the \texttt{summary} of the \texttt{aov} object?

## Your commands here!

With the \texttt{lm} model object:

1. Output the summary
2. Determine what objects are nested within the \texttt{lm} model object
3. Extract the residual degrees of freedom from the \texttt{lm} model object
4. Determine what objects are nested within the \texttt{summary} of the \texttt{lm} model object
5. Extract the F-statistic from the \texttt{summary} of the \texttt{lm} model object
6. Inspect the F-statistic, what do each of the 3 entries represent?

## Your commands here!

With the \texttt{anova} model object:

1. Output the object (notice we don’t need to summarize here!)
2. Determine what objects are nested within the \texttt{anova} model object
3. Extract the F-statistic and degrees of freedom from the \texttt{anova} model object

## Your commands here!

With the \texttt{TukeyHSD} model object:

1. Output the object (notice we don’t need to summarize here!)
2. Determine what objects are nested within the \texttt{TukeyHSD} model object
3. Extract the \texttt{wday} object from the \texttt{TukeyHSD} model object and print it. What is different?
4. Using the extracted \texttt{wday} object, extract the confidence interval comparing Saturday and Sunday
5. The outputs from the \texttt{TukeyHSD} and \texttt{TukeyHSD$wday} objects look extremely similar. Why can we not extract this same confidence interval from the \texttt{TukeyHSD} model object?

## Your commands here!