UFO Explorer Tutorial

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About

UFO Explorer is an interactive web based app that allows users to explore data from reported UFO sightings in North America.

Requirements

- R 4.0.1 or later
- Shiny 1.2.0 or later
- Open R and run the code below

To Run Software

If you already have R on your computer you can un comment and run the below code chunk.

```
#install.packages("shiny")
#library(shiny)
#shiny::runGitHub("ufo-explorer", "blunderfist", ref = "main")
```

If you wish to visit the app using the web you can visit https://matt2021.shinyapps.io/UFO-Explorer/.

Features

The following explains the features found in the app and how they work.

Filters

Filters are found on most pages. They allow the user to filter only the data they wish to view. Very specific filtering will likely result in few or zero results.

Descriptive Statistics Tab

Descriptive Statistics

Displays interesting descriptive statistics for each variable. User can select a single variable, or a specific location. Information displayed will vary based on chosen variable. Filters can be applied to limit results.

For a single variable:

1. Select “Single Variable” radio button.
2. Apply any filters.
3. Click the **Update** button.

For a single variable:

1. Select “Location Specific” radio button.
2. Select the country, state, or city depending on the detail desired.
3. Apply any filters.
4. Click the **Update** button.

Summary Statistics

Shows simple summary statistics for each variable in the data set. Only one variable can be selected at a time and will be instantly updated when selected. Filters are not available for this page.

Visualization Tab

Histogram

Displays a histogram showing selected variables.

Steps:

1. Choose a variable for the x axis.
2. Choose the number of bins and desired bin width.
3. Apply any filters.
4. Click **Plot**.

Scatter Plot

Displays a scatter plot for selected variables. Additional options include using colors and size to aid in categorizing variables on the plot. If **Jitter** is checked the plot will use jitter to add random noise to each point to reduce overlapping points.

Steps:

1. Choose a variable for the x axis.
2. Choose a variabel for the y axis.
3. Choose a color (optional).
4. Choose a size (optional).
5. Check jitter or leave blank.
6. Apply filters.
7. Click **Plot**.

Interactive Map

Displays a map showing blue points for the location of each report. Overlap can be a problem and filters should be used to improve readability. After selection is made click **Update** to view new map.

Statistical Analysis Tab

Wilcoxon Rank Sum Test

Allows user to compare the amount of reports between two geographic locations. Filters can be applied.

Steps:

1. Choose the level of detail for the locations (Country, State, or City).
2. Choose the two locations from the drop down menu.
3. Select either the **year** or **month** radio button.
4. Apply any filters.
5. Click **Update** to view results.
6. If the **Box Plot** box is checked, a box plot of the results will be displayed beneath the results table.

The results of the test will be displayed in a table and a brief summary of text is displayed beneath the table. The p-value is used to determine whether the two locations have a similar number of reports or not.

Simple Linear Regression

Displays a linear regression plot, model, and simple interpretation for a selected time period and reported shape.

Steps:

1. Choose a shape and unit of time from the drop down menu.
2. Apply any filters.
3. Click **Update**.

Results:

The results are plotted with a regression line. A table of the results is displayed beneath the plot, and beneath the table is a short, simple summary. Depending on the variables chosen and the filters applied there may not be enough data to show a useful results.

Comparing Frequencies of Reports

Shows the frequency of reports between either two or three states over a given time period.

Steps:

1. Choose at least two but up to three states to compare.
2. Choose a unit of time for comparison during.
3. Apply filters.
4. Click **Update**.

Results:

The results will show the number of reports for each state over the time period. For example, if **hour** is chosen, the lines will show the number of reports on each hour of the day, allowing the user to compare the number of reported sightings between up to three states over the course of a day. If **day** is chosen, the results will show the number of reports daily over the course of a month. Using filters can find specific time periods.

Example:

Compare daily UFO reports between Florida and California during the month of January during 2020.

1. Select FL for first state.
2. Select CA for second state.
3. Select day for time period.
4. Filter months to only show 1 (Jan).
5. Filter years to only show 2020.
6. Click **Update**.

If no filters are selected the results will be a generalization for the entire data set.

Contact

Comments are welcome. If you notice something that needs improvement reach out and let me know.