1. What season (spring, fall, winter, summer) is most UFO sightings found in a certain hemisphere [northern/southern or both]?

Use a multi-select box to select hemisphere(s) and a table to display the number of UFO sightings for the seasons in the selected hemisphere(s). Create a pie chart to compare the percentages of UFO sightings frequency by season(s).

multi-select box options -> northern hemisphere, southern hemisphere

EXAMPLE:

User selects both the northern and southern hemisphere from the multi-select box

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Spring (March – May) | Summer (June – August) | Fall (September – November) | Winter (December – February) |
| Northern hemisphere | x | x | x | x |
| Southern hemisphere | x | x | x | x |
| Total | x | x | x | x |

44Diagram, pie chart

Description automatically generated

1. What country has the highest UFO sightings frequency for each of the top 4 common UFO shapes located in [year range] and aggregate the count in the year range?

Use a select slider to specify a year range and a world map and a stacked bar chart to display all the countries for each of the top 4 common UFO shapes’ depending on the year range.

Write code to find the top 4 common UFO shapes.

Select slider -> between 1949 – 2013 (write code to find the min and max year; don’t manually code it)

EXAMPLE

User selects the years, 1970 - 2005

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | US (United States) | AU (Australia) | CA (Canada) | UK (United Kingdom) | DE (Germany) |
| Light | x | x | x | x | x |
| Triangle | x | x | x | x | x |
| Circle | x | x | x | x | x |
| Fireball | x | x | x | x | x |

A picture containing text, map

Description automatically generatedChart, bar chart

Description automatically generated

1. Compare states or countries which has the most UFO sightings in [year range]?

Use a radio button to specify whether the user wants to compare states or countries, use a checkbox to specify states or countries the user wants to compare (make sure the user selects only 2 options), a textbox to select the min year and max year, a line chart to display the number of UFO sightings in that year range based on the states, or countries.

Chart, line chart

Description automatically generated

Interact with and present the data based on your understanding of Pandas DataFrames, MatPlotLib, maps, and the Streamlit.io packages.

Be sure your page is "user friendly" and as "polished" as possible. Be sure to label controls requiring user interaction, make sure your charts have titles, legends or explanations that would be helpful to the user.

Feel free to add to your project as you explore Pandas and Streamlit capabilities and find cool ways to implement new or additional features.

Create your Python application with a Streamlit UI and the various visualizations. Create at least two different charts, graphs of different types with custom legends, axis labels, tick marks, colors, other features), or a map showing latitude and longitude. Be sure to include appropriate context or labels in your user interface to cue the reader about which values to specify, and the purpose of each chart or graph. You may wish to add a few sentences explaining each chart. Place all UI controls in the left sidebar, and your visualizations in the main content area. Make your application as professional looking as you can.

### Coding Checklist

As you write your program, be sure to include code that demonstrates each of these items. Each contributes to your project grade (see the rubric below).

Python Coding: At least any four of these:

1. Functions:
   1. At least one function that has two parameters that returns a value
   2. At least one function with a default parameter that returns a value
   3. At least one function that does not return a value
2. Lists and Loops:
   1. A list comprehension
   2. A loop that iterates through items in a list, dictionary, or tuple
3. Data Structures:
   1. Code that uses at least two different methods of lists, dictionaries, or tuples.

One method of list (sort) and one of dict ( dict.fromkey() ) – line 135 , 136

Streamlit:

1. At least three different UI Controls (sliders, drop downs, multi-selects, text box, etc)
2. Page design features (sidebar, fonts, colors, images, navigation)
3. Well-designed, professional-appearing, interactive website

Charts and Maps:

1. At least three different charts (well labeled)
2. Use legends, colors, labels, titles, as appropriate
3. At least one map – for full credit, include dots, icons, or other map features

Pandas: At least and 4 of these:

1. Sorting data in ascending or descending order, by one or more columns
2. Filtering data by one condition
3. Filtering data by two or more conditions with AND or OR
4. Analyzing data with pivot tables
5. Add/drop/select/create new/group columns, frequency count, other features as you wish
6. Try doing text analysis – find common words in titles, etc, or searching for locations with a particular name.