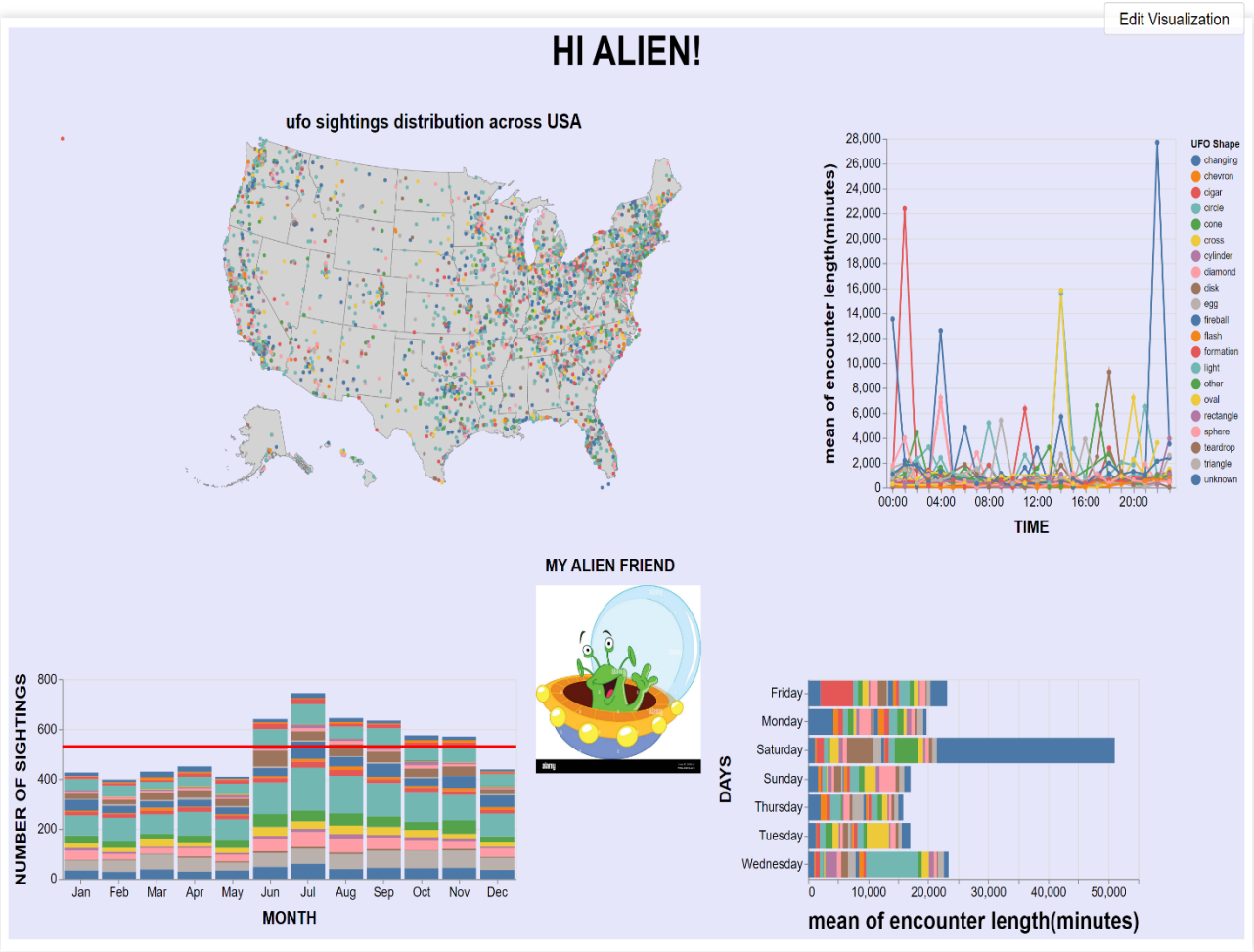
COMP40610 Visual Exploration Tool Design Document

Name: Vijayditya Sarker
Student Number:22200046

TITLE:
HI ALIEN!

Screenshot:



Dataset Overview:
My dataset is part of 2019 Tidy Tuesday Collection, called UFO Sightings around the world which contains more than 80,00 recorded UFO "sightings" around the world, including the UFO shape, lat/long, and state/country of where the sighting occurred, duration of the "event" and the data_time when it occurred. I used Python to derive my new dataset by doing a lot of pre-processing like dropping rows with duplicate values and null values, and countries that are not USA and chose 10% of the remaining records to a sample size about 6356.
I also derived new fields from the existing fields like weekday, month, and time to ease up the designing process.

Design Considerations :

Overall goal: My goal with this tool was to was to make a visualisation that will be able to convey information about, What will be the best location, time, month, or weekday to do a ufo sighting in the USA.

Dot plot Map: The dot plot map shows the location of ufo-sightings across the USA**.** Each sighting is represented by a dot that is coloured according to the ufo shape observed and This approach makes it easy to see the geographic distribution of ufo-sightings across the USA. I have also used tooltips which makes it easier for the user to gather information on the data points. The advantage of this map is we can see the distribution clearly across the country but if there was an increase in the number of records it would lead to a very crowded graph, which makes viewing of points very less distinguishable. I considered using the size scaled according to the encounter length but It lead to very less observable points due to large variations in encounter length time, this would have been possible if the number of types of ufo shapes observed was less as we have considered using it as our legends and has been used for colour encoding the points.

Line chart: The line chart represents the relationship between the mean encounter length and the hours in the entire day. We can see that there is a maximum number of sightings occurring after 10 o'clock in the night, it line chart has been colour encoded by the ufo_shapes. I thought of using a histogram as an alternative to represent the graph as it would have been easy to display but this line chart displays it in a whole lot better way and introduces variation in my visualization.2d Histogram can also be considered for this graph.

Bar chart(Month): The Bar chart displays the months and number of ufo sightings respective to it and is colour coded according to the ufo shapes, the bar graph has another layer that is a rule in colour red parallel to the x-axis that represents the threshold of the average number of sightings, the threshold helps us to easily identify which months have the best maximum chance of a sighting. Alternatively, a Line chart or Step chart can also be used but I haven't used a step chart as I wanted to show colour encoding with the ufo shape and realise the bar chart suits better for this representation.

Bar chart(Weekday): The bar chart displays the relationship between the weekdays and the average encounter length, we can see Saturday has the best result, the bar has been colour coded with the types of ufo shapes observed, as the weekdays have only seven different types of days I firstly used a pie chart to represent it but it was not giving clear understanding as they have values almost similar to each other. So, unless there is a big difference in the values, the pie chart can give false impressions.

Image: I have added an image of an alien in a ufo to make it more relatable to the visualisation, I was very fascinated with the image function and have used it to beautify And make my visualization more relatable.

Interaction consideration:

cross-filtering is the main interaction approach I have used here. Users can select subsets of the data in one chart and this will filter the data in another chart,

(i) Added a brush tool in the map so that when a location is selected it reflects in all the charts.

(ii) The entire visualisation has an interactive legend that allows selection based on different UFO shapes.

(iii) users can select only one weekday in the bar chart and this will filter the data presented in the bar chart (month), Line chart and dot map plot according to the day selected.

When all of the interactions are used together they allow us to answer the question-
" What is the best location, month, day or time to do a UFO sighting"

So, go out there and use this visualisation to make a new Extra-terrestrial friend.