

A high-resolution image of Earth from space, showing the continents of Africa and Europe. The Earth is illuminated from the right, creating a bright blue glow along its horizon. The background is a deep black space filled with numerous small, distant stars.

# UFO SIGHTINGS

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## INTRODUCTION

For the final project I'm looking at UFO Sightings again. Here's a quick refresher on the data.



## SUMMARY

NUFORC is the National UFO Reporting Center where the reports of UFO sightings are stored. The goal of this project is to use machine learning to see if it's possible to predict the shape of the UFO by location.

# PROCESS

- Used Jupyter Notebook to pull data
- Executable path created to search for table
- Looped through each link to create the data frame
- Result = Data pulled from almost 1,000 links

```
executable_path = {'executable_path': ChromeDriverManager().install()}
browser = Browser('chrome', **executable_path, headless=False)

url = 'http://www.nuforc.org/webreports/ndxevent.html'
browser.visit(url)

===== WebDriver manager =====
Current google-chrome version is 94.0.4606
Get LATEST driver version for 94.0.4606
Driver [C:\Users\alig_\wdm\drivers\chromedriver\win32\94.0.4606.61\chromedriver.]

data = browser.find_by_css("td a")

ufo_links = [x["href"] for x in data]

browser.quit()

df_list = []
for index, i in enumerate(ufo_links):
    df = pd.read_html(i)[0]
    df_list.append(df)
    print(index)
    time.sleep(1)
```

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# PROCESS

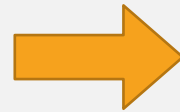
## NUFORC Site

### National UFO Reporting Center Report Index by Month

*Click on links for details*

[NUFORC Home](#)

Reports	Count
<a href="#">10/2021</a>	95
<a href="#">09/2021</a>	223
<a href="#">08/2021</a>	238
<a href="#">07/2021</a>	177
<a href="#">06/2021</a>	200
<a href="#">05/2021</a>	458



### National UFO Reporting Center Monthly Report Index For 09/2021

*Click on links for details*

[NUFORC Home](#)

Date / Time	City	State	Shape	Duration	
<a href="#">9/30/21 22:50</a>	Ocala	FL		45 seconds	Object trave
<a href="#">9/30/21 22:49</a>	Atlanta	GA	Fireball	2 minutes	Maybe a me
<a href="#">9/30/21 21:45</a>	Lakeland	GA	Other	60 seconds	Straight ligh
<a href="#">9/30/21 21:25</a>	Grand Haven	MI	Light	01:00	Single, Brigh
<a href="#">9/30/21 20:59</a>	Lewis Center	OH	Triangle	5 minutes	Traveling ea:
<a href="#">9/30/21 20:40</a>	Fenton	MI	Oval	90 seconds	Bright white
<a href="#">9/30/21 20:30</a>	Los Angeles	CA	Circle	10 seconds	Two bright s
<a href="#">9/30/21 19:02</a>	Franklin	KY			MADAR Nod
<a href="#">9/30/21 16:18</a>	Whittier	CA	Chopping	3 minutes	Today Sento



# DATA CLEANUP

- Data frame created
- Prior to merging the csvs
  - The city and state were combined to a new column(Locations)
  - All sightings that were missing the location were dropped
  - Canadian sightings were dropped due to variation in data entry
- After cleaning- over 100,000 rows were left

```
ufo_sightings['Location'] = ufo_sightings['City'] + ", " + ufo_sightings['State']  
ufo_sightings
```

Date / Time	City	State	Shape	Duration
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```
ufo_sightings = ufo_sightings.dropna(how="all", subset=["Location"])  
ufo_sightings
```

```
[:  
      Date / Time      City State  Shape  Duration  
0  9/17/94 22:40  Laguna Hills  CA      Light  15 minutes  At 10:40 am I will
```

## VISUAL #1

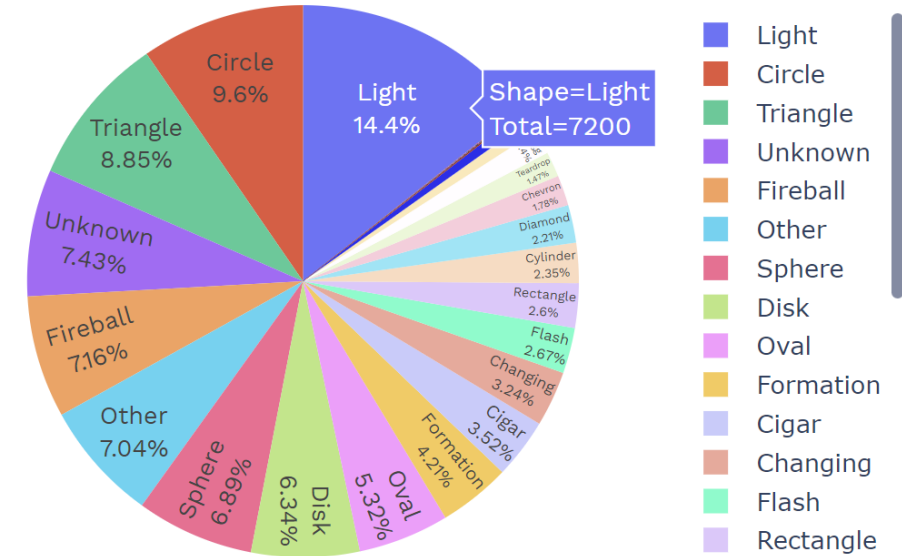
- Grouped the sightings by shapes
- Removed any sightings less than 5
- Created a pie chart with the name and percent inside the wedge
- `json.dumps`- creates a trace to pass the data through as html

```
#Create the pie chart
fig = px.pie(df, values='ID', names='Shape',
             title='Shapes of UFO Sightings',
             hover_data=['ID'], labels={'ID':'Total'})
fig.update_traces(textposition='inside', textinfo='percent+label')
fig1JSON = json.dumps(fig, cls =plotly.utils.PlotlyJSONEncoder)
```

# VISUAL #1

- Grouped the sightings by shapes
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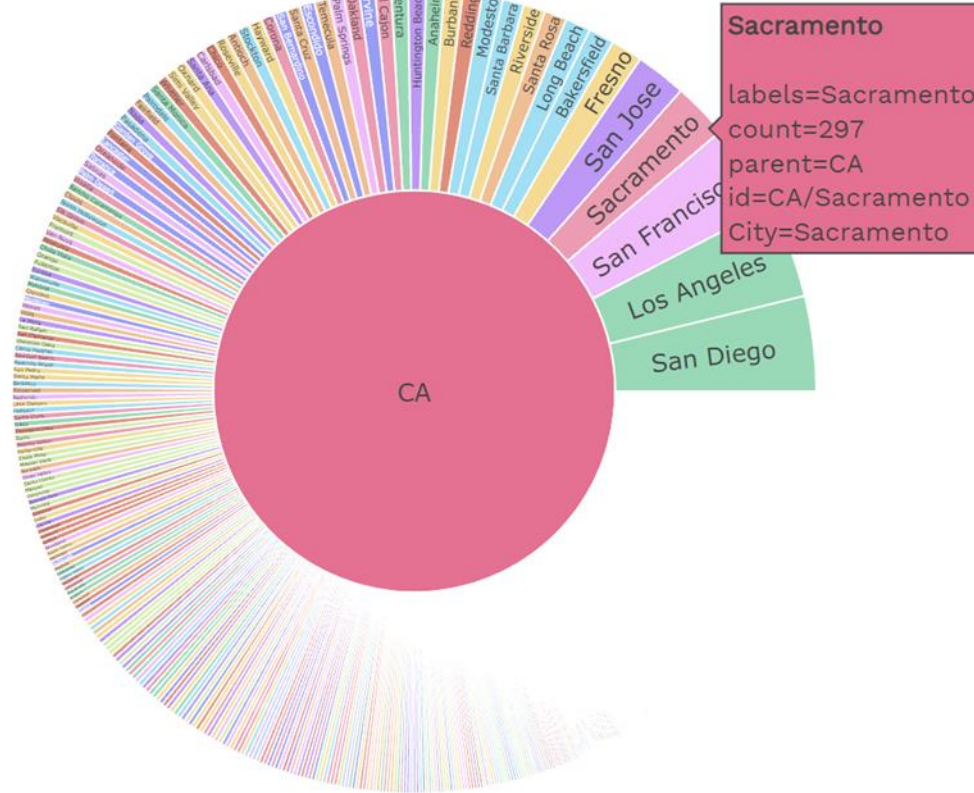
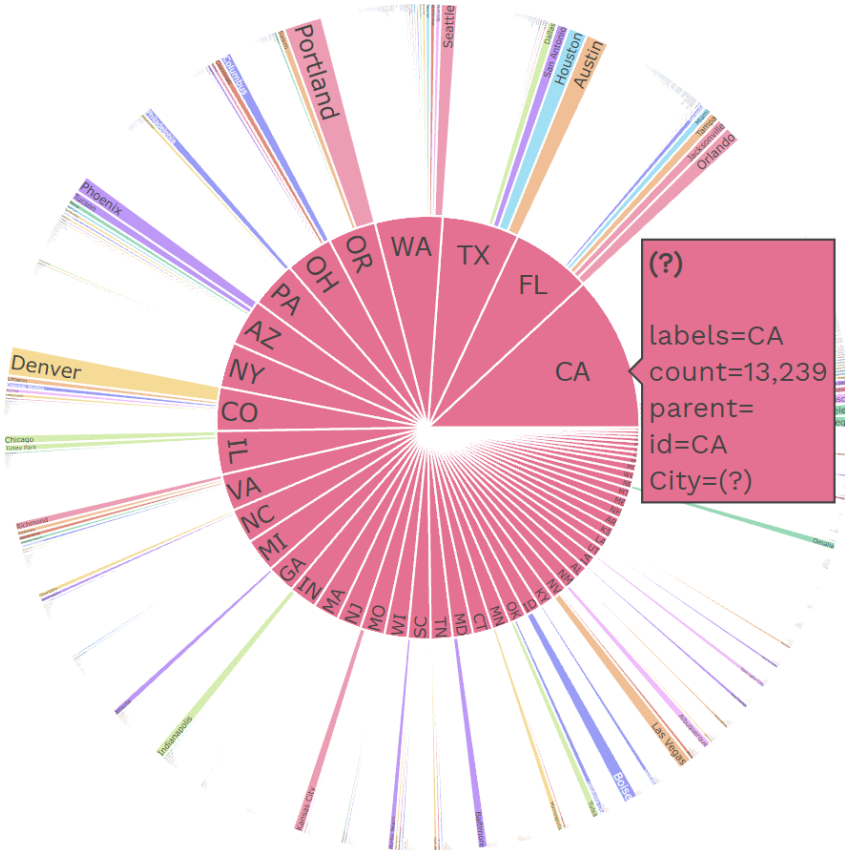
Shapes of UFO Sightings



This pie chart is showing the reported shapes of the UFO sightings with the count and percentage. The most popular shape is Light. Sighting reports were created by viewers and submitted as free-text. This causes a variety in the data provided.



# VISUAL #2



## SETBACKS

- Submissions are dependent on how the user enters the data- this created a wide variety of data types that needed to be cleaned
- The varied entries limited the number of categories that could be used
- Initially running the machine learning crashed the notebook due to RAMs being used(too many columns)
- There is a very weak correlation between location and shape prediction
- Prediction is currently overfitting

## DISCUSSION

The column Category was created by combining the shapes into 2 groups: Light and Dim. The shapes placed in each group was decided by me. This was to help with the accuracy of the training as having even the limited 9 shapes as the class gave poor predictions.

## GOING FORWARD

- Interesting to try other categories such as date
- Require more time cleaning the data and making it uniform

QUESTIONS?