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**Final Project Technical Notebook**  
**Introductory Python**  
**Monday, May 20, 2019**

**Part 1. Introduction**

Anime became popular in the 20th century, with the earliest films dating back to as early as 1917. In the 1980's, anime experienced a boom in popularity in Japan especially with the development of anime such as Gundam, Macross, and Dragon Ball as well as genres such as real robot, space opera, cyberpunk. By the 1960s, anime has already been introduced to the Americas and started its market overseas. Several works which really made a breakthrough for anime internationally include Akira (1988), Steamboy (2004), Spirited Away which won the 2003 Academy Award for Best Animated Features, and Innocence: Ghost in the Shell which showed at the 2004 Cannes Film Festival. (1)

Currently, Crunchyroll is one of the most popular websites in which to view anime. Since 2017, it has presented the anime community with an "Anime of the Year Award" to encourage the continuous production and viewing of anime. (2)

**Part 2. Proposal**

As a data scientist/ engineer for AnimeProductionCo., my job is to help my company achieve its business objective of accomplishing better sales for its latest animated show. In particular, I will pool data across several recent films that won Crunchyroll's Anime Award of the Year and search for common factors that make them a success. Some questions I will be asking include: what is the location in which the show was produced? How long is the show? Is it available on other major viewing engines especially Netflix which would help with an international audience? Does the month or season of the year in which the anime is broadcasted important? For instance, would broadcasting the anime in the summer time make it more popular than the Fall or Winter when people have work?

**Part 3. Solution**

As a result of my research and analysis, several factors appear to influence the success of anime shows that won the Anime Award of the Year in recent years. I analyzed Devilman Crybaby (2019), Made in Abyss (2018), and Yuri On Ice (2017). All three were produced in Tokyo, suggesting that the capital might be a factor in the successful animation and sales of the shows such as better resources and finance. Secondly, all three were approximately ten episodes long in length indicating that a shorter show length is popular with the audience. Perhaps the audience is hooked earlier on with a shorter show and that a longer show would lose the audience's interest with repetitive storylines. All three are showing on Netflix making it very accessible internationally as well as locally. It is not hard to view those animes if one wants to. Each has a varying month and season in which it first showed on tv which suggests that the month of broadcast does not actually matter. However, I cannot confirm as my sample size of three is too small.

In addition to pooling more animes to analyse, I would need more data on the internal affairs of the animes especially starting budget or cost and final profits over the years. I would like to be able to show that with better technology over time, the animes bring in more revenue over a shorter period of time. Please refer to Part 4 below for graphs and details.

#### Part 4. Technical Notebook

*Code Part 1:*

```
#Final Project: Data Visualization on Anime Award Winner
```

```
import pandas as pd
```

```
import numpy as np
```

```
import matplotlib.pyplot as plt
```

```
# set the plots to display in the Jupyter notebook
```

```
%matplotlib inline
```

```
# change plotting colors per client request
```

```
plt.style.use('ggplot')
```

```
# Increase default figure and font sizes for easier viewing.
```

```
plt.rcParams['figure.figsize'] = (8, 6)
```

```
plt.rcParams['font.size'] = 14
```

```
anime_award_list = pd.read_csv('../datasets/anime.csv')
```

```
anime_award_list.head()
```

	year	anime_title	company_sponsor	production_location	episode_length	run_month	Netflix_available	starting_budget	sales_and_profit
0	2019	Devilman Crybaby	Science Sura	Tokyo	13	Winter	TRUE	?	?
1	2018	Made in Abyss	Kinema Citrus	Tokyo	10	Summer	TRUE	?	?
2	2017	Yuri On Ice	MAPPA	Tokyo	12	Fall	TRUE	?	?

(3)

*Code Part 2:*

```
objects = (anime_award_list['production_location'].drop_duplicates(keep='first'))
```

```
y_pos = np.arange(len(objects))
```

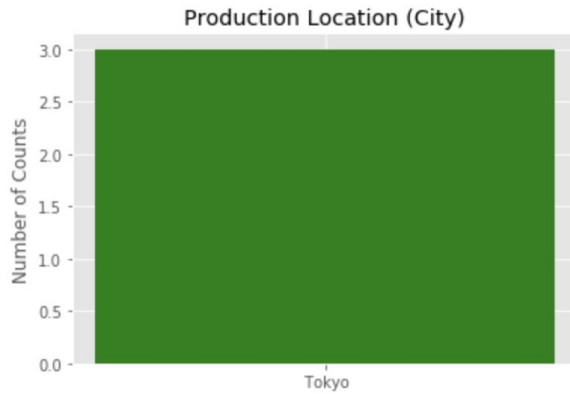
```
performance = (anime_award_list['production_location'].value_counts().head())
```

```
plt.bar(y_pos, performance, align='center', alpha=0.99, color = 'green')
```

```
plt.xticks(y_pos, objects)
```

```
plt.ylabel('Number of Counts')
plt.title('Production Location (City)')
```

```
plt.show()
```

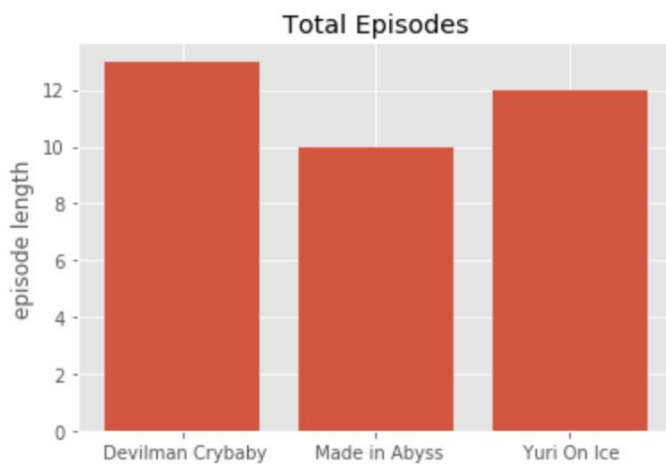


*Code Part 3:*

```
objects = (anime_award_list['anime_title'].head())
y_pos = np.arange(len(objects))
performance = (anime_award_list['episode_length'].head())
```

```
plt.bar(y_pos, performance, align='center', alpha=0.99)
plt.xticks(y_pos, objects)
plt.ylabel('episode length')
plt.title('Total Episodes')
```

```
plt.show()
```



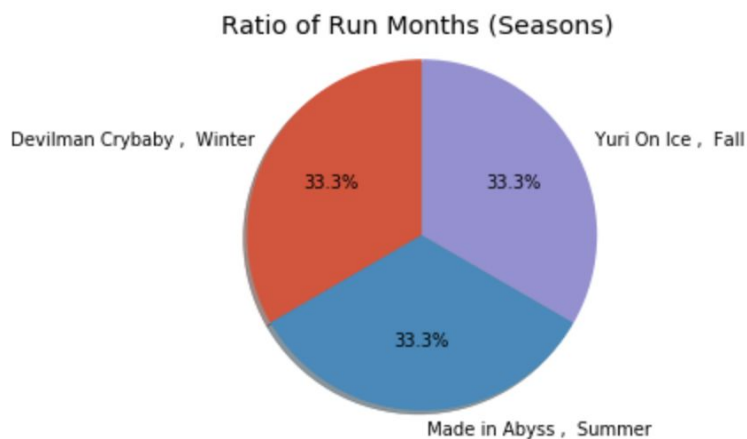
#### Code Part 4:

```
import matplotlib.pyplot as plt

# Pie chart, where the slices will be ordered and plotted counter-clockwise:
labels = (anime_award_list['anime_title'].head() + " , " + anime_award_list['run_month'].head())

sizes = [10,10,10]

fig1, ax1 = plt.subplots()
ax1.pie(sizes, labels=labels, autopct='%1.1f%%',
        shadow=True, startangle=90)
ax1.axis('equal') # Equal aspect ratio ensures that pie is drawn as a circle.
plt.title('Ratio of Run Months (Seasons) ')
plt.show()
```

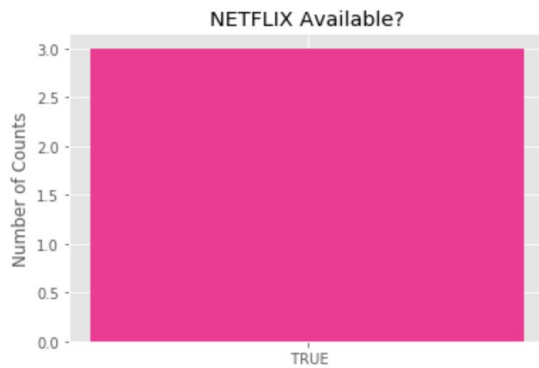


#### Code Part 5:

```
objects = (anime_award_list['Netflix_available'].drop_duplicates(keep='first'))
y_pos = np.arange(len(objects))
performance = (anime_award_list['Netflix_available'].value_counts().head())

plt.bar(y_pos, performance, align='center', alpha=0.99, color = 'deeppink')
plt.xticks(y_pos, objects)
plt.ylabel('Number of Counts')
plt.title('NETFLIX Available?')

plt.show()
```



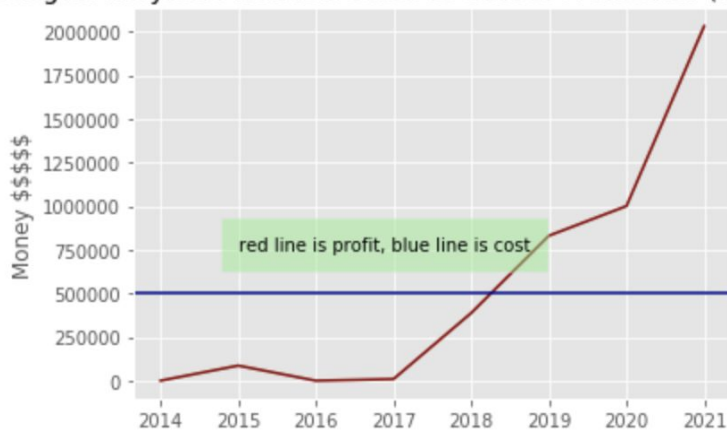
*Code Part 6:*

```
x = [2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021]
y = [730, 87000, 500, 10000, 388000, 830450, 1000429, 2030291]
plt.plot(x, y, color = 'darkred')
plt.axhline(y=500000, color = 'darkblue')

plt.text(2015, 750000, 'red line is profit, blue line is cost',
        bbox={'facecolor': 'lightgreen', 'alpha': 0.5, 'pad': 10})

plt.title('Budget Analysis: Profit and Sales vs Cost of Production (Early Years)')
plt.ylabel('Money $$$$')
plt.show()
```

**Budget Analysis: Profit and Sales vs Cost of Production (Early Years)**



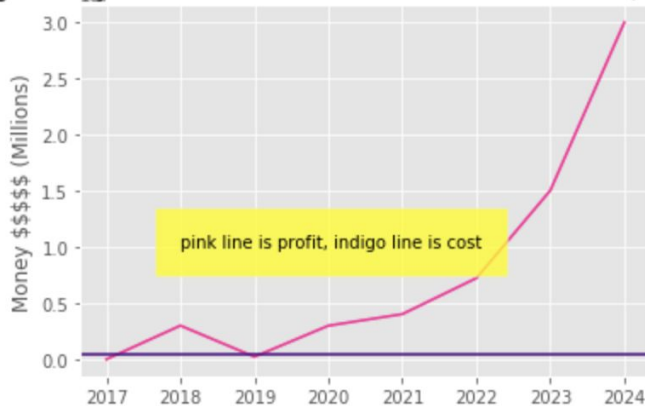
### Code Part 7:

```
x = [2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024]
y = [10000, 3008000, 230450, 3000429, 4030291, 7232093, 15038040, 30000000]
plt.plot(x, y, color = 'deeppink')
plt.axhline(y=500000, color = 'indigo')

plt.text(2018, 10000000, 'pink line is profit, indigo line is cost',
        bbox={'facecolor': 'yellow', 'alpha': 0.8, 'pad': 15})

plt.title('Budget Analysis: Profit and Sales vs Cost of Production (Later Years)')
plt.ylabel('Money $$$$ (Millions)')
plt.show()
```

Budget Analysis: Profit and Sales vs Cost of Production (Later Years)



### Part 5. References

- (1) [https://en.wikipedia.org/wiki/History\\_of\\_anime](https://en.wikipedia.org/wiki/History_of_anime)
- (2) <https://www.crunchyroll.com/animeawards/index.html>
- (3) [https://en.wikipedia.org/wiki/Devilman\\_Crybaby](https://en.wikipedia.org/wiki/Devilman_Crybaby)  
[https://en.wikipedia.org/wiki/Made\\_in\\_Abyss](https://en.wikipedia.org/wiki/Made_in_Abyss)  
[https://en.wikipedia.org/wiki/Yuri\\_on\\_Ice](https://en.wikipedia.org/wiki/Yuri_on_Ice)