In [4]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [3]:
```
users_df = pd.read_csv("cleaned_datasets/users_details_dataset_cleaned.csv")
anime_df = pd.read_csv("cleaned_datasets/anime_dataset_cleaned.csv")
user_score_df = pd.read_csv("cleaned_datasets/user_scores_cleaned.csv")
```

2. Seokwoo Park(50608072)

---

1 - (a) Question 1: Is it possible to find out the differences between time to watch anime and other columns?
1 - (b) Hypothesis 1: I can make sure that developed countries are likely to have more time to watch anime due to their economic prosperity and advanced cultural development.

1 - (c') Operation 1: I can create a graph to compare them by collecting the average anime viewing times by country
1 - (c'') The result: Traditional economically developed countries do not rank in the top 10 in terms of anime viewing time. This suggests that anime may not be directly related to a country's economic level.

1 - (d') Operation 2: It is possoble to convert the cleaned Birthday column into age using 2024 which is the current year. Then, next step will be to group the rows by age and plot the results as a line graph. The graph will plotted ages from 20 to 40 in ascending order.
1 - (d'') The result: There was a trend of increasing daily viewing time in the age range of approximately 23 to 35.

---

2 - (a) Question 2: When grouping columns based on age, What kind of correlation or trend can we derive from this?
2 - (b) Hypothesis 2: With the increasing variety of anime in recent years, viewing time and the number of viewers are likely to grow as age increases.

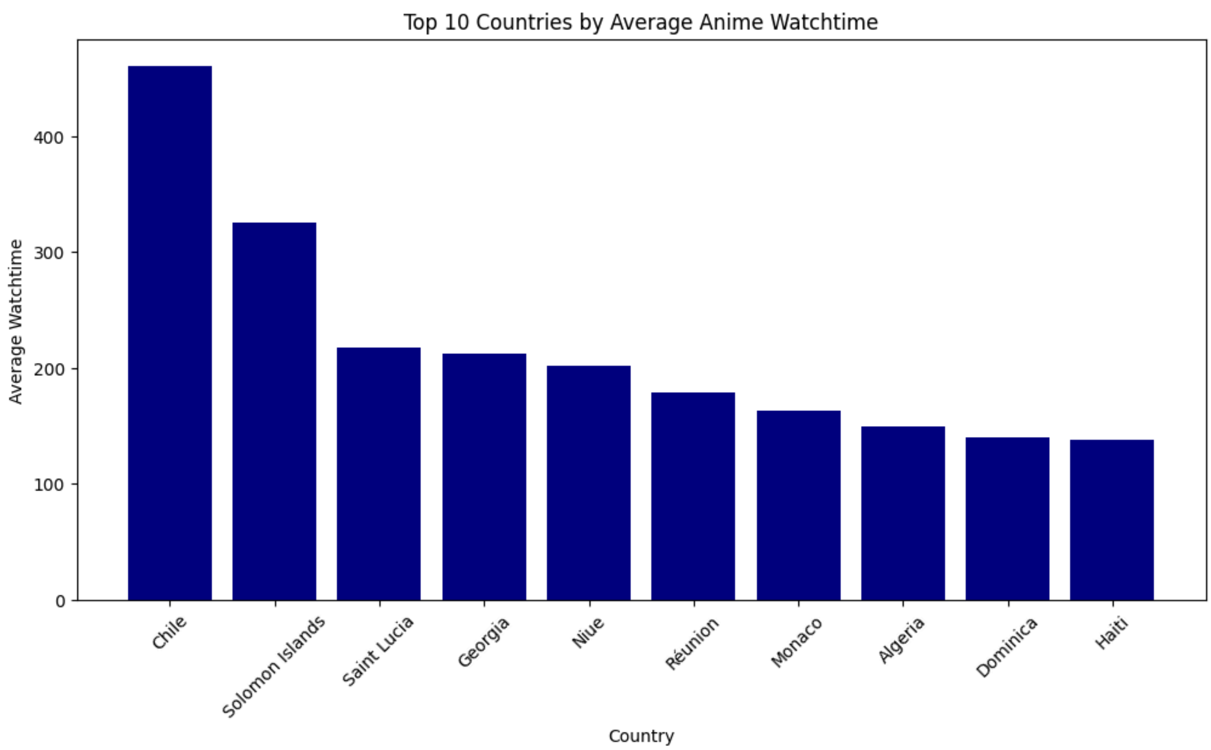
2 - (c') Operation 1: It is possible to display a graph that shows the average daily anime viewing time and the number of viewers for each age group by grouping rows by age.
2 - (c'') The result: There was a trend of increasing daily viewing time and the number of viwers in the age range of approximately 23 to 35.

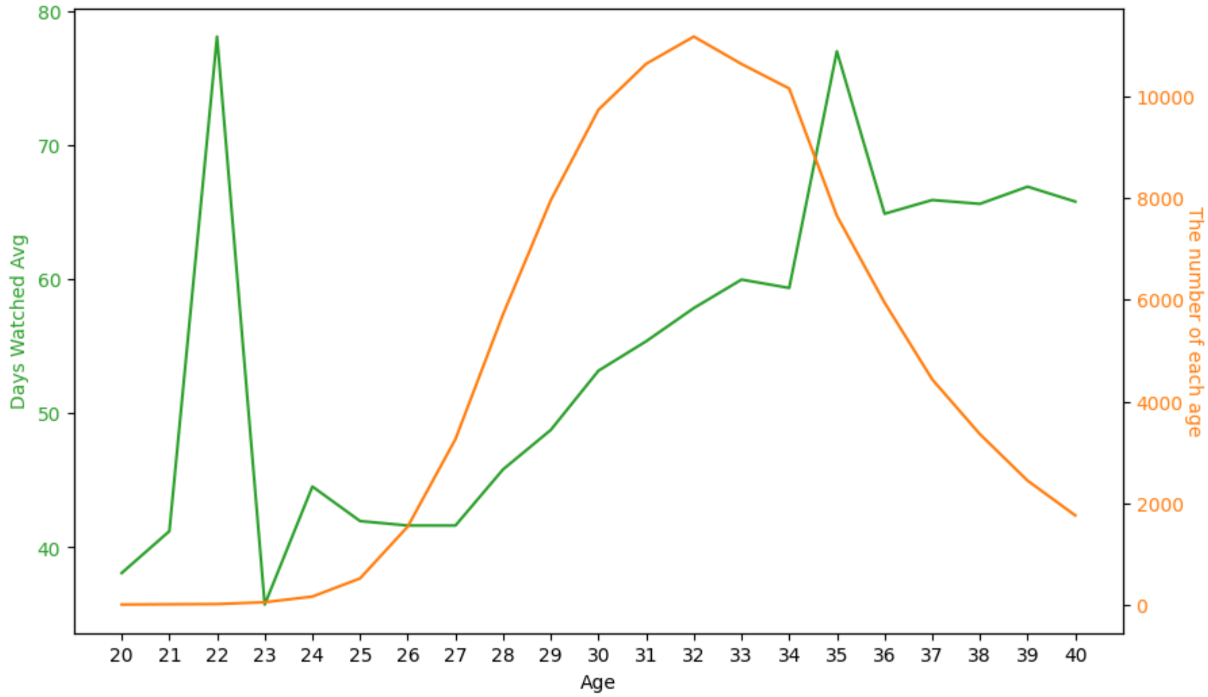
2 - (d') Operation 2: After grouping the dataset by age, a line graph is plotted to examine the correlation between the number of people who stopped watching anime halfway and the number of people who planned to watch it.
2 - (d'') The result: It was found that the two figures were highest among people in their early twenties, and no correlation was observed in other age groups.

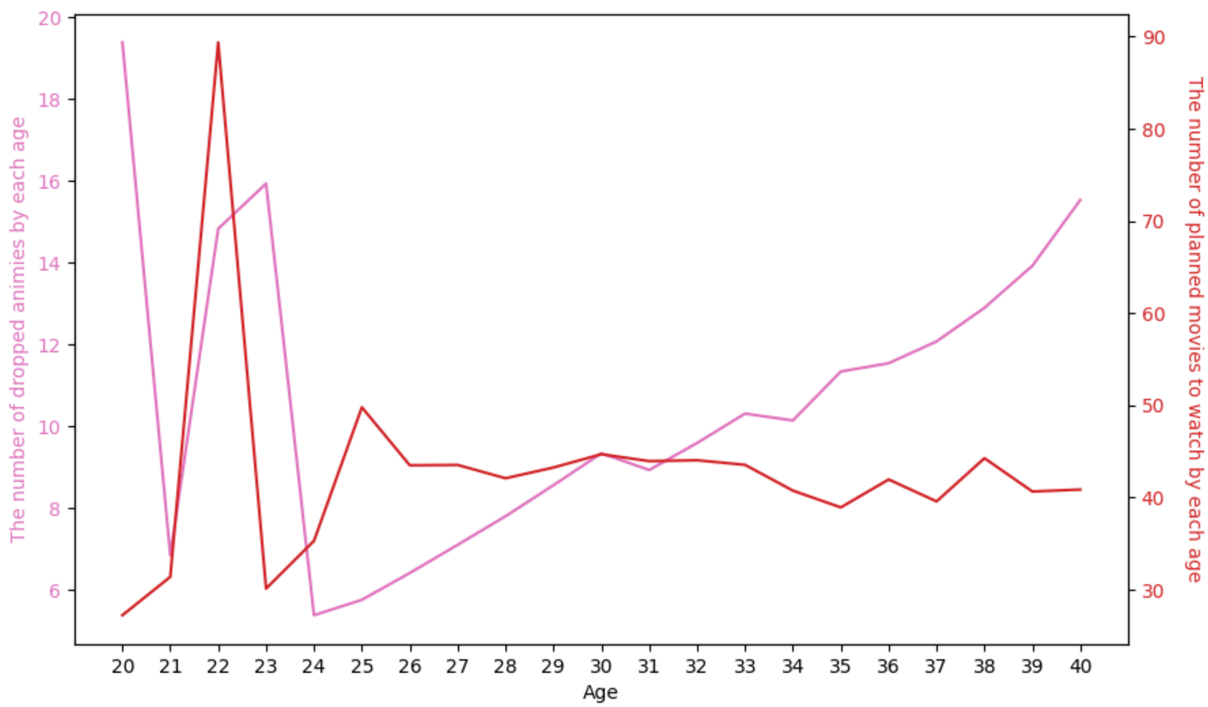
In [5]:
```
# Hypothesis 1 - Operation 1
country_watch_df = users_df.groupby('Location')['Days Watched'].mean().reset
top_ten_countries = country_watch_df.sort_values(by='Days Watched', ascendir
# print(top_ten_countries)

plt.figure(figsize=(12, 6))
plt.bar(top_ten_countries['Location'], top_ten_countries['Days Watched'], cc
plt.title('Top 10 Countries by Average Anime Watchtime')
```

```
plt.xlabel('Country')
plt.ylabel('Average Watchtime')
plt.xticks(rotation=45)

# -----------------------------------------------------------------------------
# Operation 2 of Hypothesis 1 and Operation 1 of Hypothesis 2
from datetime import datetime

current_year = datetime.now().year
age_watch_df = users_df[['Birthday', 'Days Watched', 'Dropped', 'Plan to Wat

for index, row in age_watch_df.iterrows():
    if pd.notnull(row['Birthday']):
        birth_year = int(row['Birthday'][0:4])
        # To caluculate an age by subtracting the birth year from the curren
        age_watch_df.at[index, 'Birthday'] = current_year - birth_year

age_grouped = age_watch_df[(age_watch_df['Birthday'] >= 20) & (age_watch_df[
    Days_Watched=('Days Watched', 'mean'),
    Number=('Birthday', 'size'),
    Dropped=('Dropped', 'mean'),
    Plan_To_Watch=('Plan to Watch', 'mean')
).reset_index()

print(age_grouped)

fig, ax1 = plt.subplots(figsize=(10, 6))

ax1.set_xlabel('Age')
ax1.set_ylabel('Days Watched Avg', color='tab:green')
ax1.plot(age_grouped['Birthday'], age_grouped['Days_Watched'], color='tab:gr
ax1.tick_params(axis='y', labelcolor='tab:green')

ax2 = ax1.twinx()
ax2.set_ylabel('The number of each age', color='tab:orange', rotation=270)
ax2.plot(age_grouped['Birthday'], age_grouped['Number'], color='tab:orange',
ax2.tick_params(axis='y', labelcolor='tab:orange')
plt.xticks(age_grouped['Birthday'], rotation=45)
plt.show()

# -----------------------------------------------------------------------------
# Operation 2 of Hypothesis 2

fig, ax3 = plt.subplots(figsize=(10, 6))

ax3.set_xlabel('Age')
ax3.set_ylabel('The number of dropped animies by each age', color='tab:pink'
ax3.plot(age_grouped['Birthday'], age_grouped['Dropped'], color='tab:pink',
ax3.tick_params(axis='y', labelcolor='tab:pink')

ax4 = ax3.twinx()
ax4.set_ylabel('The number of planned movies to watch by each age', color='t
ax4.plot(age_grouped['Birthday'], age_grouped['Plan_To_Watch'], color='tab:r
ax4.tick_params(axis='y', labelcolor='tab:red')
plt.xticks(age_grouped['Birthday'], rotation=45)
plt.show()
```

	Birthday	Days_Watched	Number	Dropped	Plan_To_Watch
0	20	38.084615	13	19.384615	27.230769
1	21	41.205556	18	6.833333	31.388889
2	22	78.095652	23	14.826087	89.347826
3	23	35.732203	59	15.932203	30.118644
4	24	44.533529	170	5.370588	35.294118
5	25	41.959013	527	5.747628	49.779886
6	26	41.627896	1545	6.403236	43.493204
7	27	41.627301	3260	7.092638	43.526687
8	28	45.817708	5715	7.792301	42.083990
9	29	48.758602	7952	8.552188	43.246982
10	30	53.175044	9729	9.331792	44.692055
11	31	55.371060	10630	8.924358	43.941293
12	32	57.847420	11164	9.585274	44.036456
13	33	59.970177	10626	10.303783	43.539243
14	34	59.346693	10145	10.135633	40.741449
15	35	77.003492	7645	11.334336	38.921256
16	36	64.880677	5941	11.535937	41.951692
17	37	65.906406	4433	12.070156	39.573878
18	38	65.621263	3358	12.892793	44.258487
19	39	66.902085	2446	13.919869	40.647588
20	40	65.788826	1763	15.530913	40.858196




Days Watched Avg
The number of each age
Age
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
40 50 60 70 80
0 2000 4000 6000 8000 10000


The number of dropped animies by each age
The number of planned movies to watch by each age
Age
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
6 8 10 12 14 16 18 20
30 40 50 60 70 80 90

In [ ]: