Grey's Anatomy Viewership

Grey's Anatomy is a popular and long-running American medical drama television series. The show was created by *Shonda Rhimes* and premiered on March 27, 2005. Set in the fictional *Grey Sloan Memorial Hospital*, formerly known as *Seattle Grace Hospital*, it revolves around the personal and professional lives of a group of surgical interns, residents, and attending physicians.

The central character of the show is *Dr. Meredith Grey*, played by *Ellen Pompeo*, who serves as the narrator. Throughout the series, viewers follow *Meredith's* journey as she navigates the challenges of her medical career and the complexities of her personal relationships.

```
Image(filename='C:\\Users\\lizan\\OneDrive\\Desktop\\grey_s_anatomy_wallpaper_by_cityinmot
```

Source: https://www.deviantart.com/cityinmotion/art/Grey-s-Anatomy-Wallpaper-85292474

```
import os
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
from IPython.display import Image

# Set the path
file_path = "C:\\Users\\lizan\\OneDrive\\Desktop\\RR_quarto_data.xlsx"

# Read data from the source file
# Source: https://en.wikipedia.org
df = pd.read_excel(file_path)
# Preview data
```

```
df.head()
```

Statistics on Viewership:

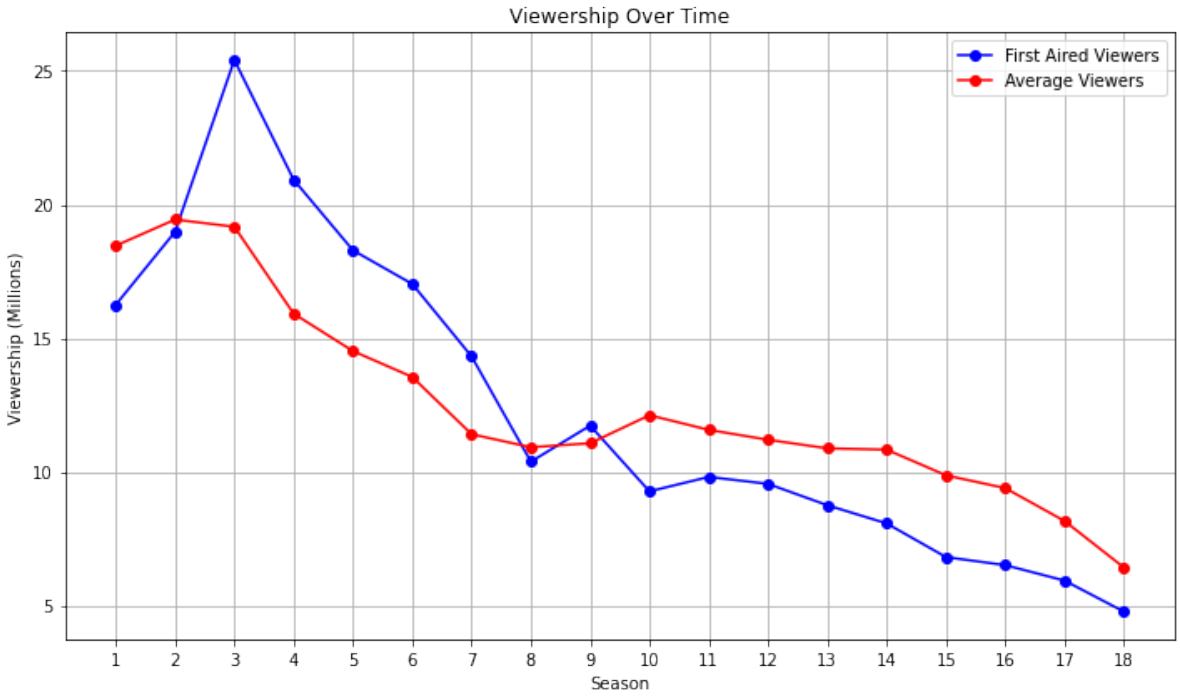
```
# Summary of basic statistics on viewership
viewership_stats = df[['FirstAired_Viewers', 'LastAired_Viewers', 'Avg_viewers', 'Viewersh
print("Summary of Basic Statistics on Viewership:")
print(viewership_stats)
```

```
Summary of Basic Statistics on Viewership:
       FirstAired_Viewers  LastAired_Viewers  Avg_viewers  Viewership_rank
count           18.000000          18.000000    18.000000        18.000000
mean            12.377222          11.787778    12.494444        19.833333
std              5.877135           6.252615     3.688502         8.972179
min              4.770000           4.190000     6.420000         5.000000
25%              8.240000           7.680000    10.842500        12.750000
50%             10.095000           8.955000    11.305000        19.500000
75%             16.835000          16.872500    14.277500        26.750000
max             25.410000          22.570000    19.440000        34.000000
```

- The average viewership of the first episode of each season ranges from approximately 4.77 million to 25.41 million, with a mean of approximately 12.38 million. The standard deviation indicates moderate variability in first-episode viewership across seasons.
- The average viewership of the last episode of each season ranges from approximately 4.19 million to 22.57 million, with a mean of approximately 11.79 million. The standard deviation suggests some variability in last-episode viewership across seasons.
- The average viewership across all episodes within each season ranges from approximately 6.42 million to 19.44 million, with a mean of approximately 12.49 million. The standard deviation indicates moderate variability in average viewership across seasons.
- The viewership ranks of the seasons range from 5 to 34. The mean rank is approximately 19.83, indicating that, on average, the show's viewership ranks around the middle among all seasons.

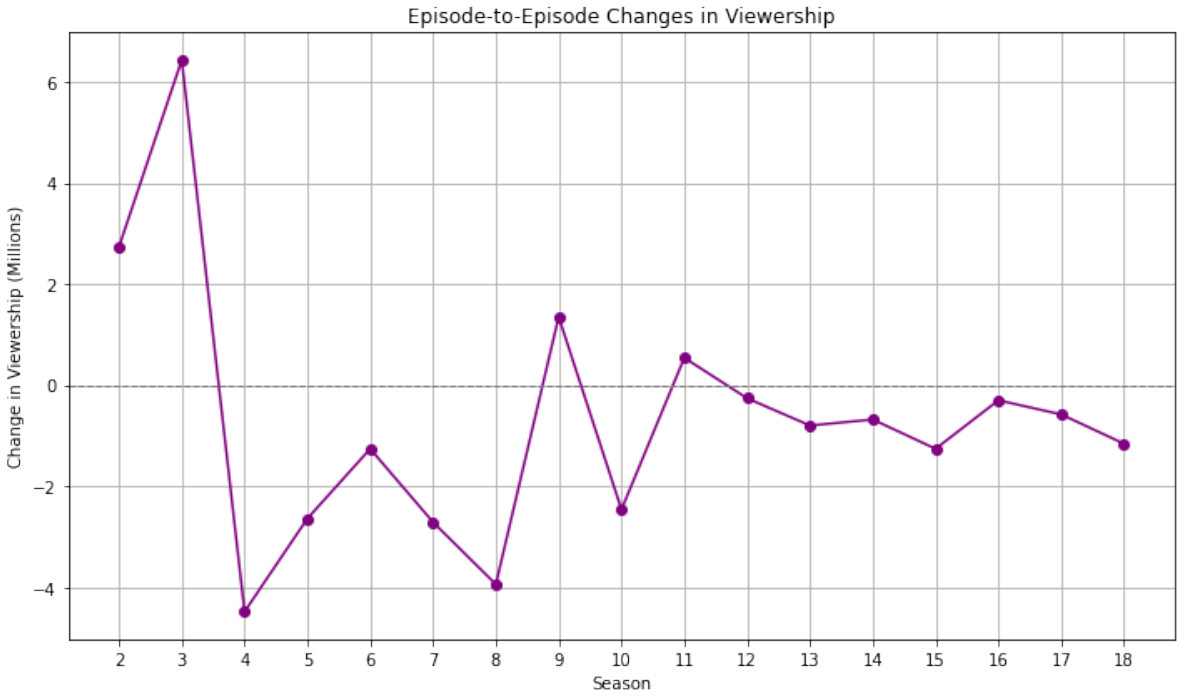
```
# Graph of viewership over time
plt.figure(figsize=(10, 6))
plt.plot(df['Season'], df['FirstAired_Viewers'], marker='o', label='First Aired Viewers',
plt.plot(df['Season'], df['Avg_viewers'], marker='o', label='Average Viewers', color='red'
plt.xlabel('Season')
plt.ylabel('Viewership (Millions)')
plt.title('Viewership Over Time')
plt.legend()
```

```
plt.grid(True)
plt.xticks(df['Season'])
plt.tight_layout()
plt.show()
```



The TV show is experiencing a noticeable decline in audience interest.

```
# Graph of season-to-season changes in viewership
episode_changes = np.diff(df['FirstAired_Viewers'])
seasons = df['Season'][1:]  # Exclude the first season as there's no previous season to co
plt.figure(figsize=(10, 6))
plt.plot(seasons, episode_changes, marker='o', color='purple')
plt.axhline(0, color='gray', linestyle='dashed', linewidth=1)
plt.xlabel('Season')
plt.ylabel('Change in Viewership (Millions)')
plt.title('Episode-to-Episode Changes in Viewership')
plt.grid(True)
plt.xticks(seasons)
plt.tight_layout()
plt.show()
```



The most significant decline in viewership occurred during the 4th season.

```
# Changes in viewership
max_decrease_season1to5 = np.min(episode_changes[:5])
max_decrease_season3to5 = np.min(episode_changes[2:5])
max_increase_season16to17 = np.max(episode_changes[15:17])

print(f"The viewership decreased by {max_decrease_season1to5:.2f} million between seasons
print(f"The viewership decreased by {max_decrease_season3to5:.2f} million between seasons
print(f"The viewership increased by {max_increase_season16to17:.2f} million between season
```

```
The viewership decreased by -4.48 million between seasons 1 and 5.
The viewership decreased by -4.48 million between seasons 3 and 5.
The viewership increased by -0.58 million between seasons 16 and 17.
```

Overall, the results indicate that the show experienced a significant viewership decline between the early seasons (1 to 5) and a slight decrease in viewership between seasons 16 and 17. These findings may prompt the show's creators and producers to analyze the factors that contributed to these declines, such as plot developments, competition from other shows, or changes in marketing strategies. By understanding the reasons behind the viewership changes,

they can make informed decisions to address any issues and improve the show's appeal to the audience.