

Analysis On University Students Sleeping Patterns



Why this topic?



Why this topic?

Understanding sleep patterns in university students is essential because it directly impacts academic performance, mental health, and overall well-being. Sleep is crucial for cognitive functioning, memory consolidation, and stress management.

However, university students often face irregular schedules, workload pressures, and social influences that can disrupt healthy sleep. By analyzing sleep patterns, we can identify trends, challenges, and potential interventions to promote better sleep habits, enhancing students' academic outcomes and long-term health.



Tools and Data Info

- Python
- Jupyter Notebook
- Numpy
- Pandas
- Matplotlib
- Seaborn

Tools and Data Info

- **Platform:** *Kaggle*
 - **Collected By:** *Arsalan Jamal in 2024*
 - **Sample Size:** *[Number of students]*
 - **Data Points Collected:** *Sleep duration, bedtime, wake-up time, academic workload, and lifestyle habits.*
-
- **Shape:**



A screenshot of a Jupyter Notebook interface. The top bar shows a user icon, a dropdown arrow, and a toolbar with icons for undo, redo, insert, and delete. Below the toolbar, a code cell is visible with the text `df.shape`. The output of the cell is displayed below the code, showing `[19]` on the left, a checkmark, `0.0s`, and the word `Python` on the right. The output itself is `(500, 15)`.

```
df.shape
```

```
[19] ✓ 0.0s Python
```

```
... (500, 15)
```


Tools and Data Info

```
df.shape
```

[19] ✓ 0.0s Python

... (500, 15)

```
print("\nUnique Values:\n", df['Gender'].unique(),"\n", df
['University_Year'].unique())
```

✓ 0.0s Python

Unique Values:
['Other', 'Male', 'Female']
Categories (3, object): ['Female', 'Male', 'Other']
['2nd Year', '1st Year', '4th Year', '3rd Year']
Categories (4, object): ['1st Year', '2nd Year', '3rd Year', '4th Year']

Tools and Data Info

```
print("\nUnique Values:\n", df['Gender'].unique(),"\n", df  
['University_Year'].unique())
```

✓ 0.0s

Python

Unique Values:

['Other', 'Male', 'Female']

Categories (3, object): ['Female', 'Male', 'Other']

['2nd Year', '1st Year', '4th Year', '3rd Year']

Categories (4, object): ['1st Year', '2nd Year', '3rd Year', '4th Year']

```
df.duplicated().sum()
```

✓ 0.0s

Python

0

Tools and Data Info

```
df.duplicated().sum()
```

✓ 0.0s

Python

0

```
dict(df.nunique())
```

✓ 0.0s

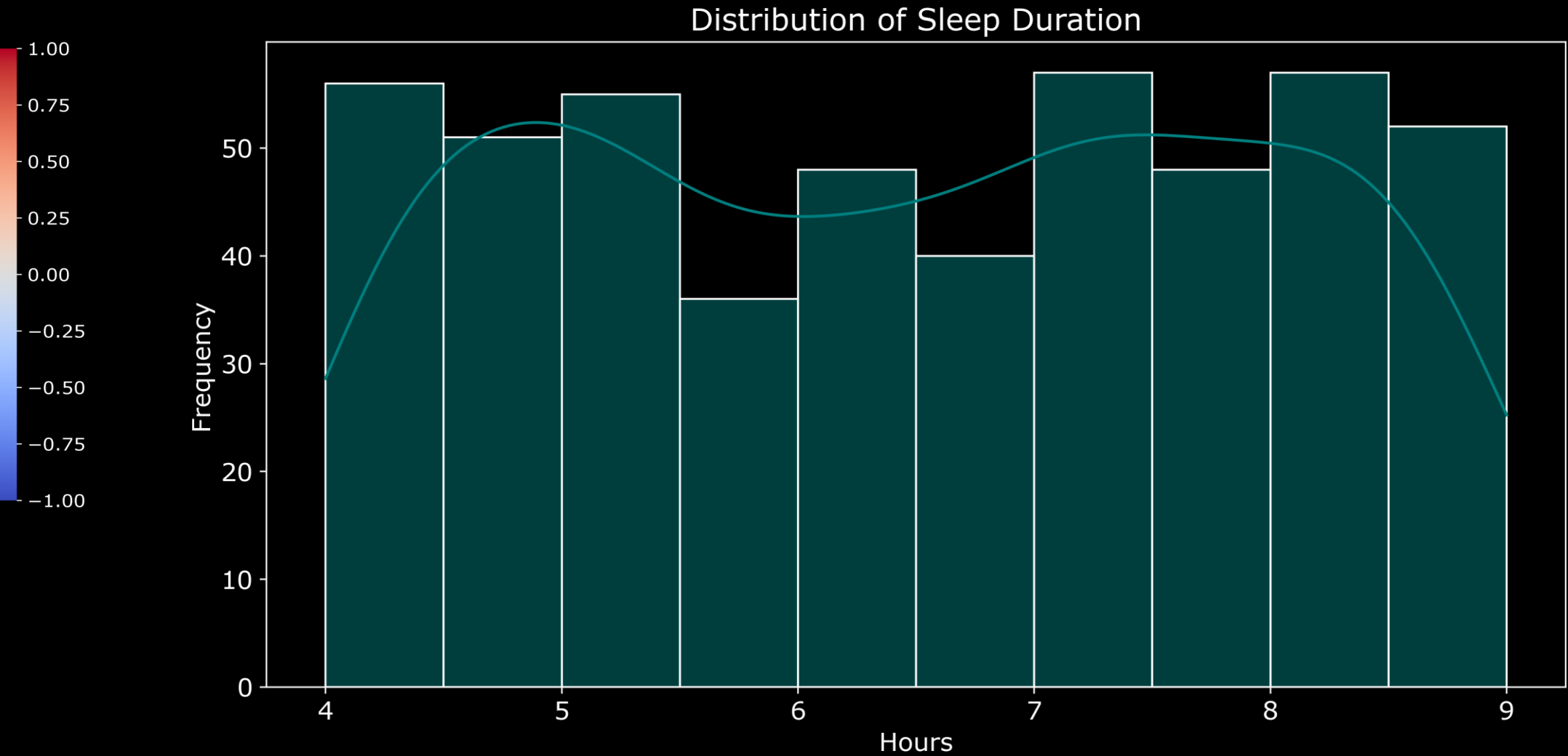
Python

```
{'Student_ID': 500,  
'Age': 8,  
'Gender': 3,  
'University_Year': 4,  
'Sleep_Duration': 51,  
'Study_Hours': 116,  
'Screen_Time': 31,  
'Caffeine_Intake': 6,  
'Physical_Activity': 120,  
'Sleep_Quality': 10,  
'Weekday_Sleep_Start': 452,  
'Weekend_Sleep_Start': 442,  
'Weekday_Sleep_End': 289,  
'Weekend_Sleep_End': 297,  
'Weekend_vs_Weekday': 423}
```

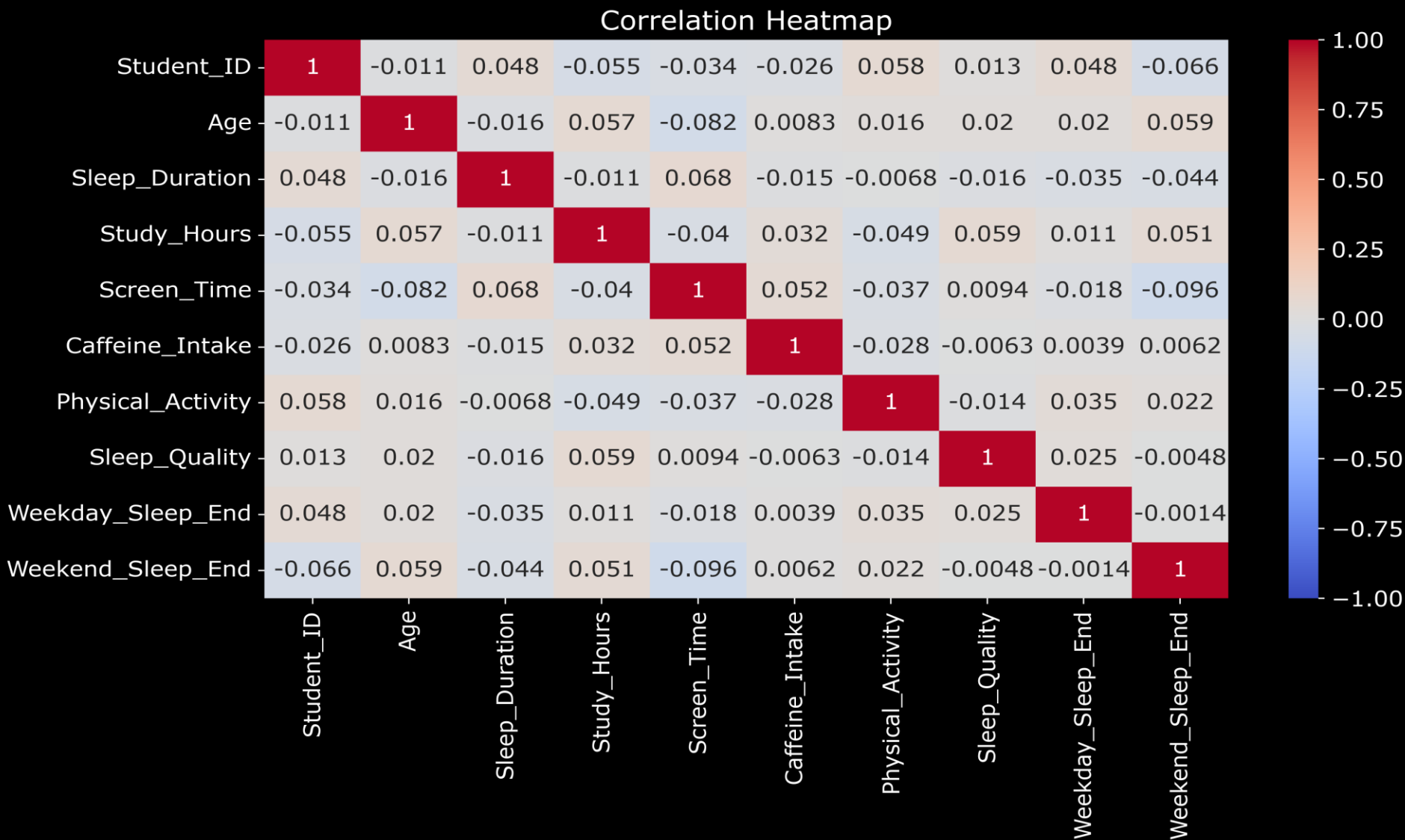



VISUALIZATIONS OF THE DATASET

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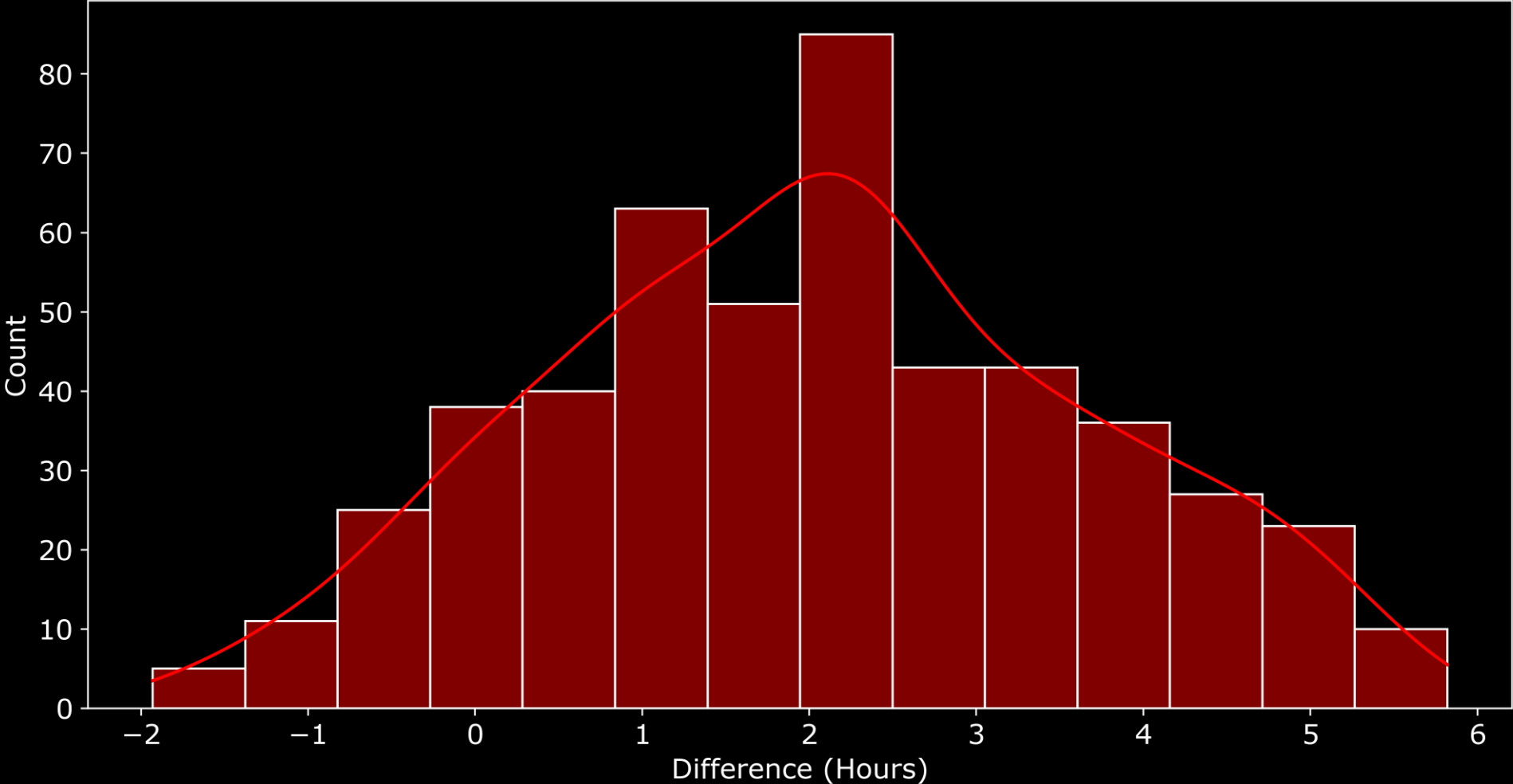
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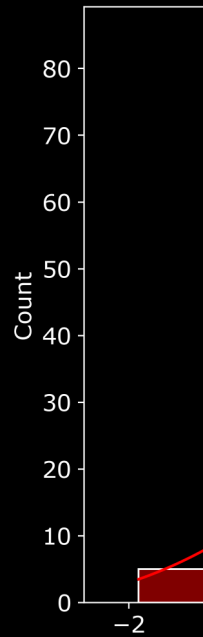
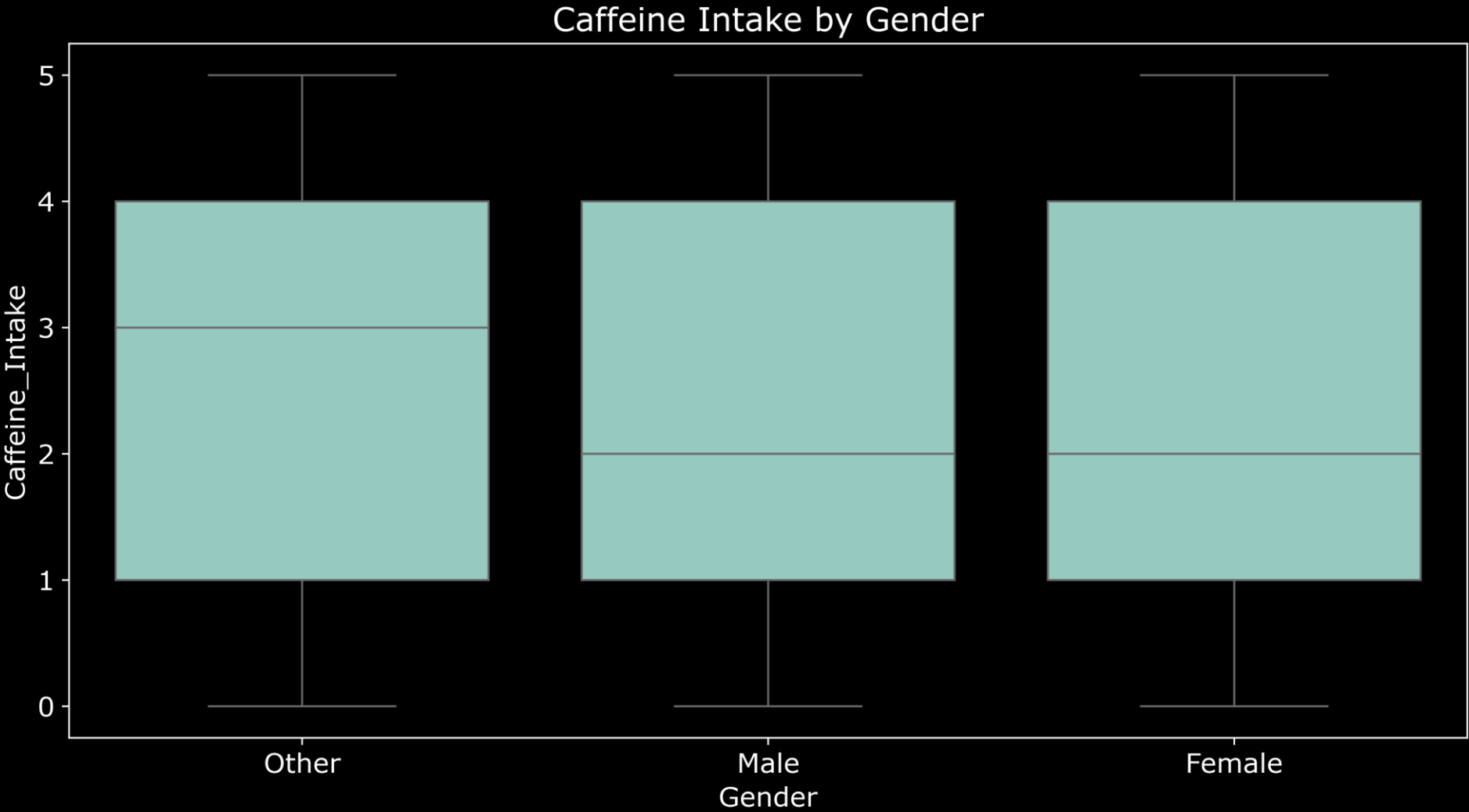


Difference in Sleep Duration: Weekends vs Weekdays

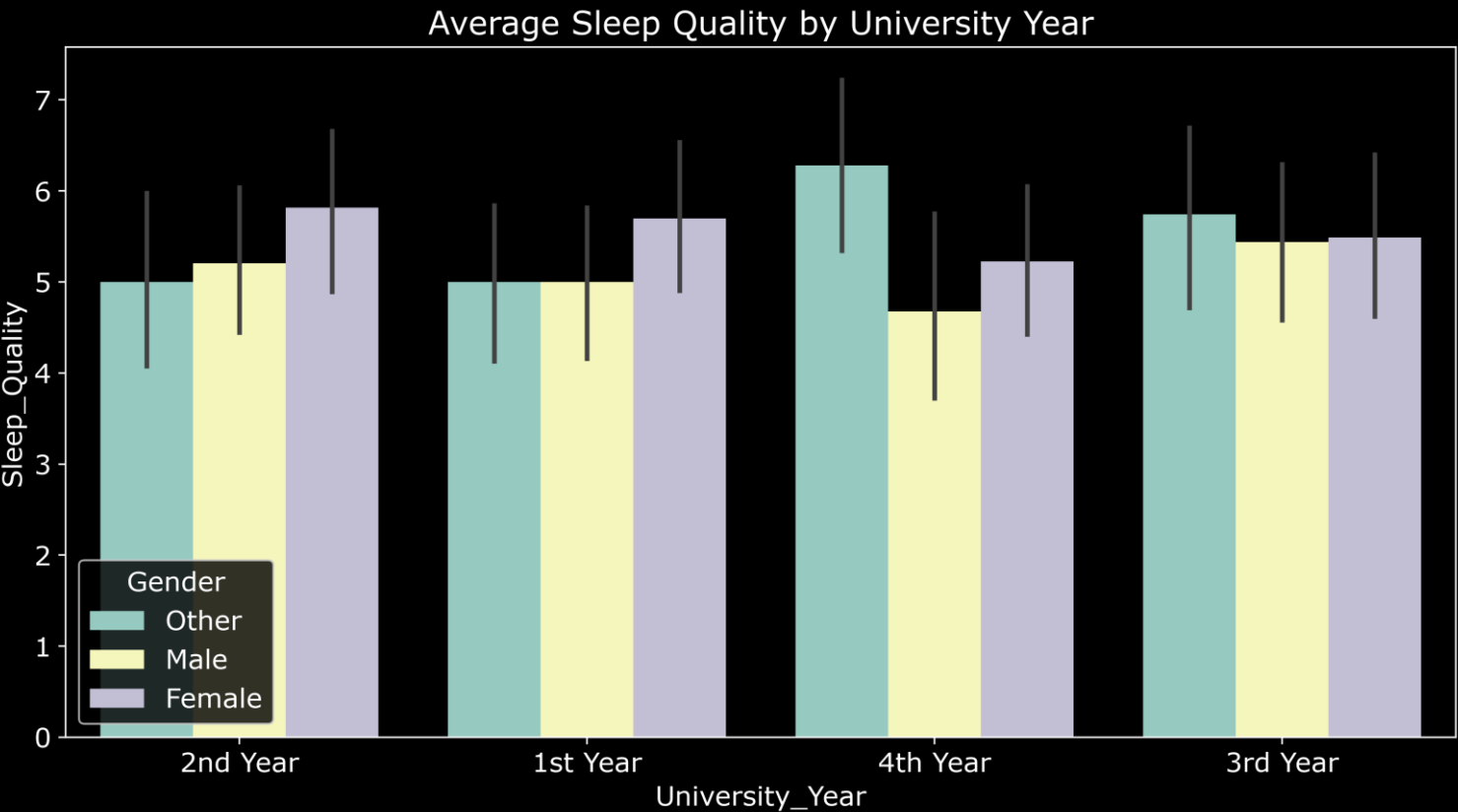


- Study
- Sleep_D
- Study
- Scree
- Caffeine
- Physical_
- Sleep_
- Weekday_Sle
- Weekend_Sle

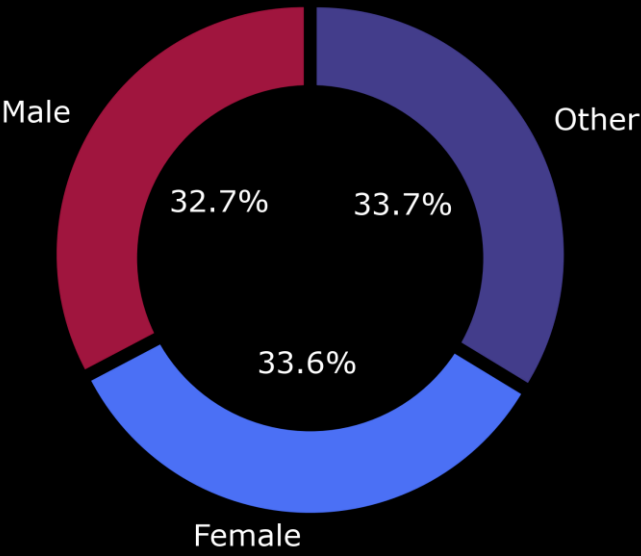
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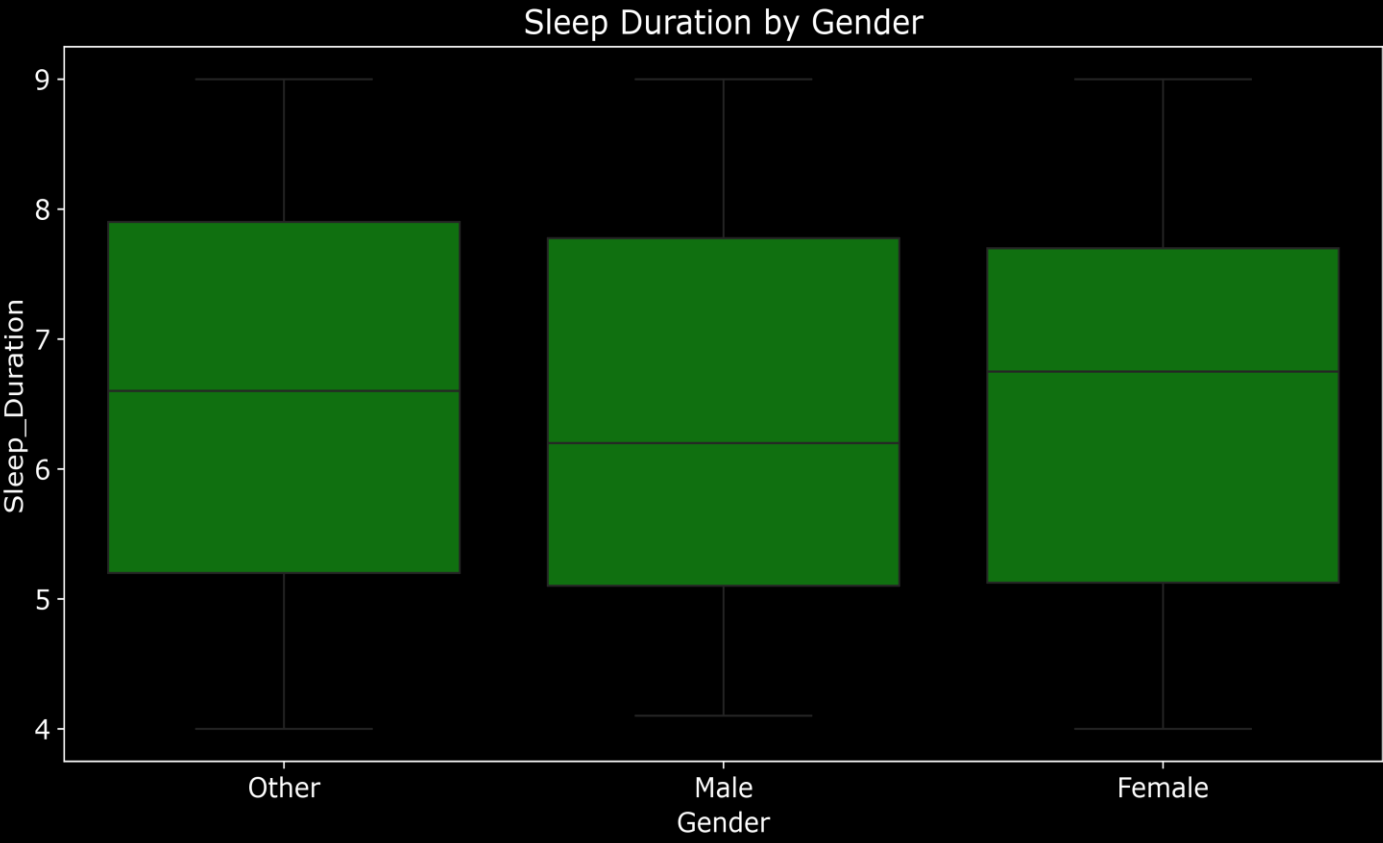
VISUALIZATIONS OF THE DATASET



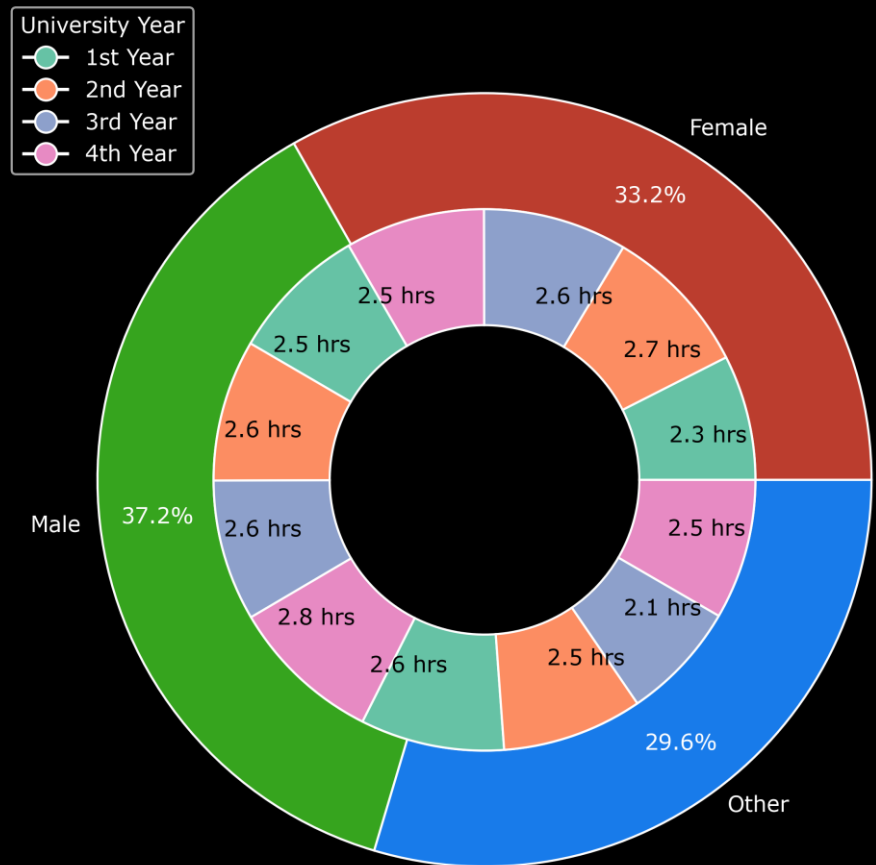
Avg Sleep Duration of Each Gender Type



VISUALIZATIONS OF THE DATASET



Screen Time Breakdown by Gender and University Year



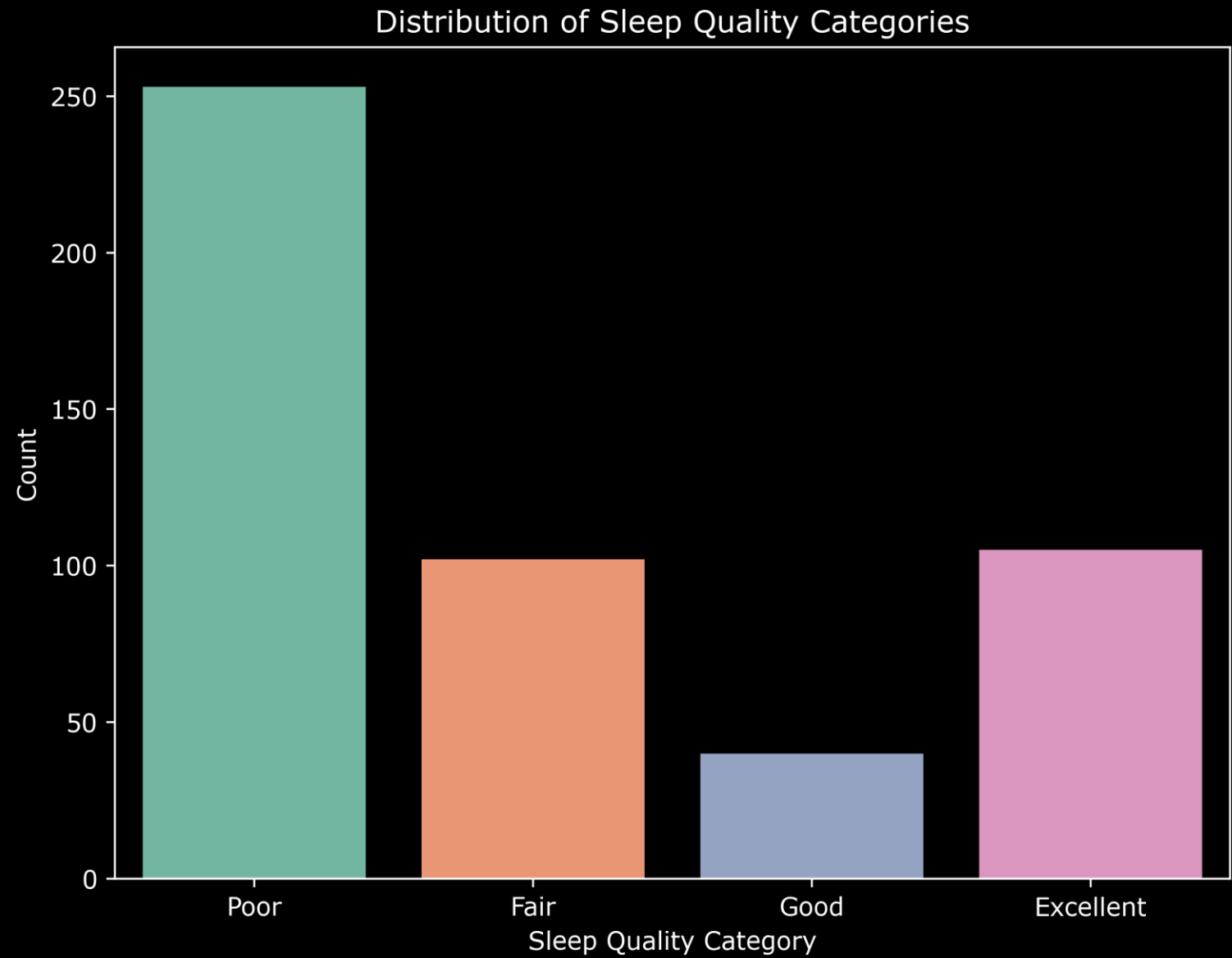
Sleep Quality Category

```
df['Sleep_Quality_Category'] = pd.cut(df['Sleep_Quality'], bins=[0, 5, 7, 8, 10],
                                     labels=['Poor', 'Fair', 'Good', 'Excellent'])
```

```
# Calculate daily average caffeine intake (assuming 'Total_Caffeine' column)
df['Avg_Daily_Caffeine'] = df['Caffeine_Intake'] / 7
```

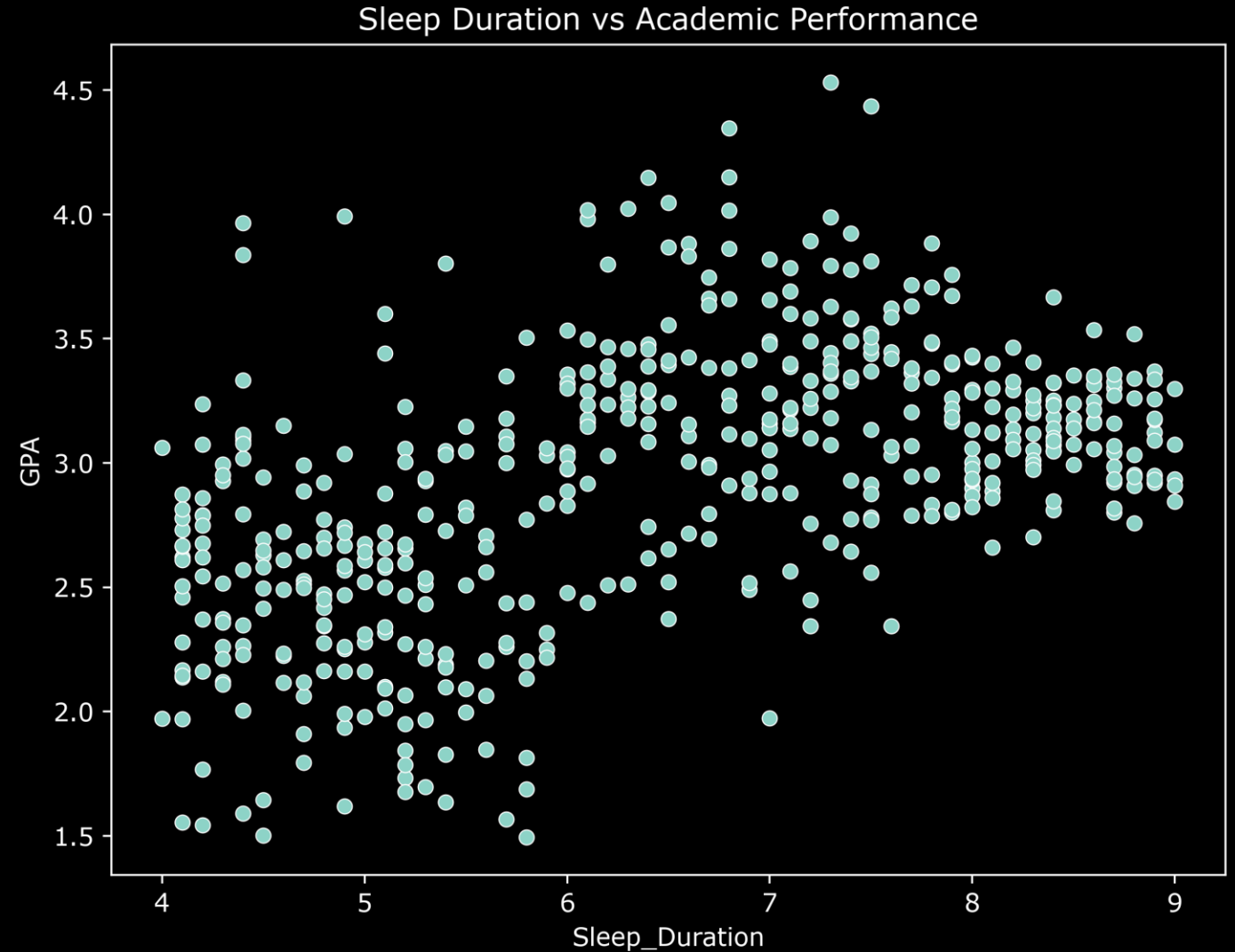
```
# Bin caffeine intake
df['Caffeine_Level'] = pd.cut(df['Caffeine_Intake'], bins=[0, 2, 5, np.inf], labels=['Low', 'Medium', 'High'])
```

Sleep Quality Category



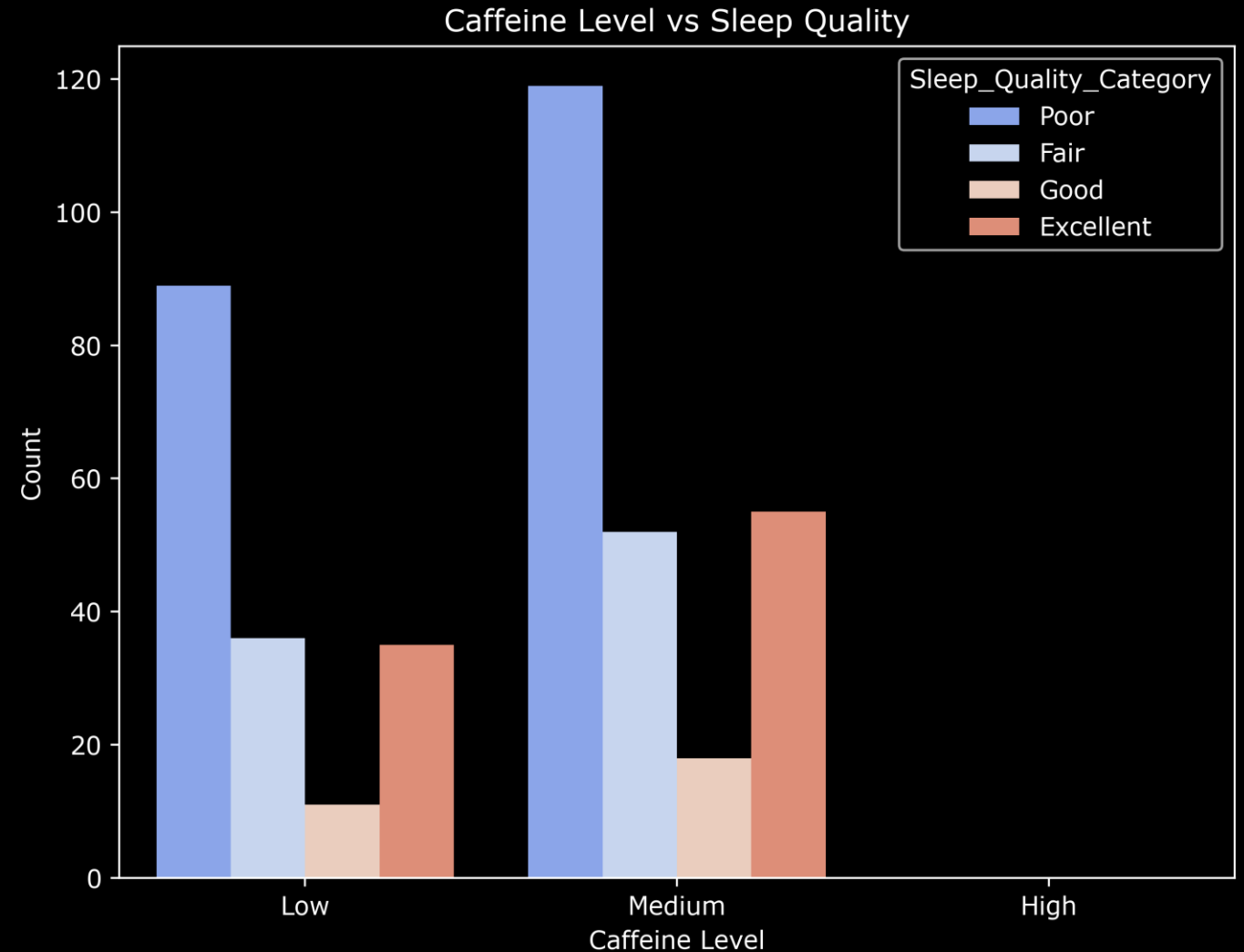
How Quality Sleep affects Academic Performance?

- Good sleep is essential for learning and remembering information. They can focus better in class, remember what they studied, and solve problems more easily.
- Poor sleep, on the other hand, makes it harder to concentrate, leads to forgetfulness, and increases stress and anxiety, which can make schoolwork feel overwhelming.



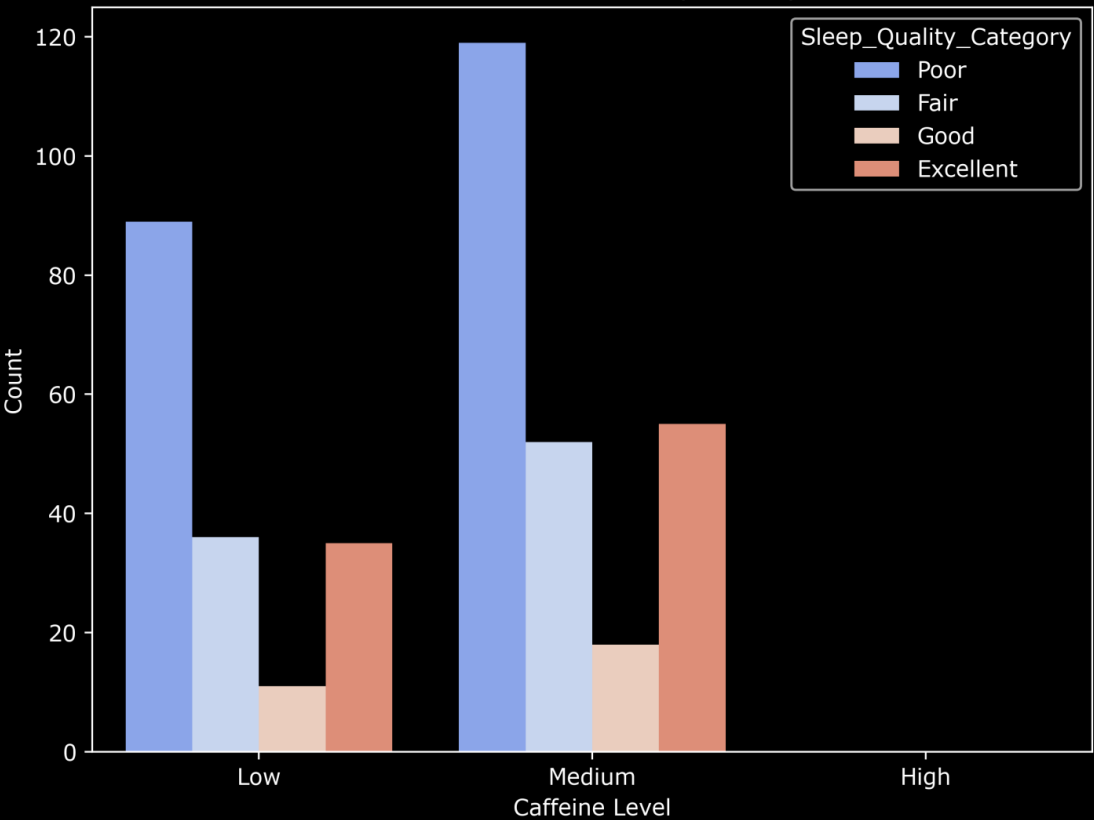
Caffeine and Sleep Quality

- Caffeine is a common stimulant that can significantly impact sleep quality. While it helps students stay awake and focused during late night study sessions, caffeine can also delay sleep onset, reduce total sleep time, and disrupt deep sleep stages.
- Even when consumed hours before bedtime, caffeine can remain in the body and make it harder to fall asleep or stay asleep. Relying on caffeine can lead to a cycle of poor sleep.

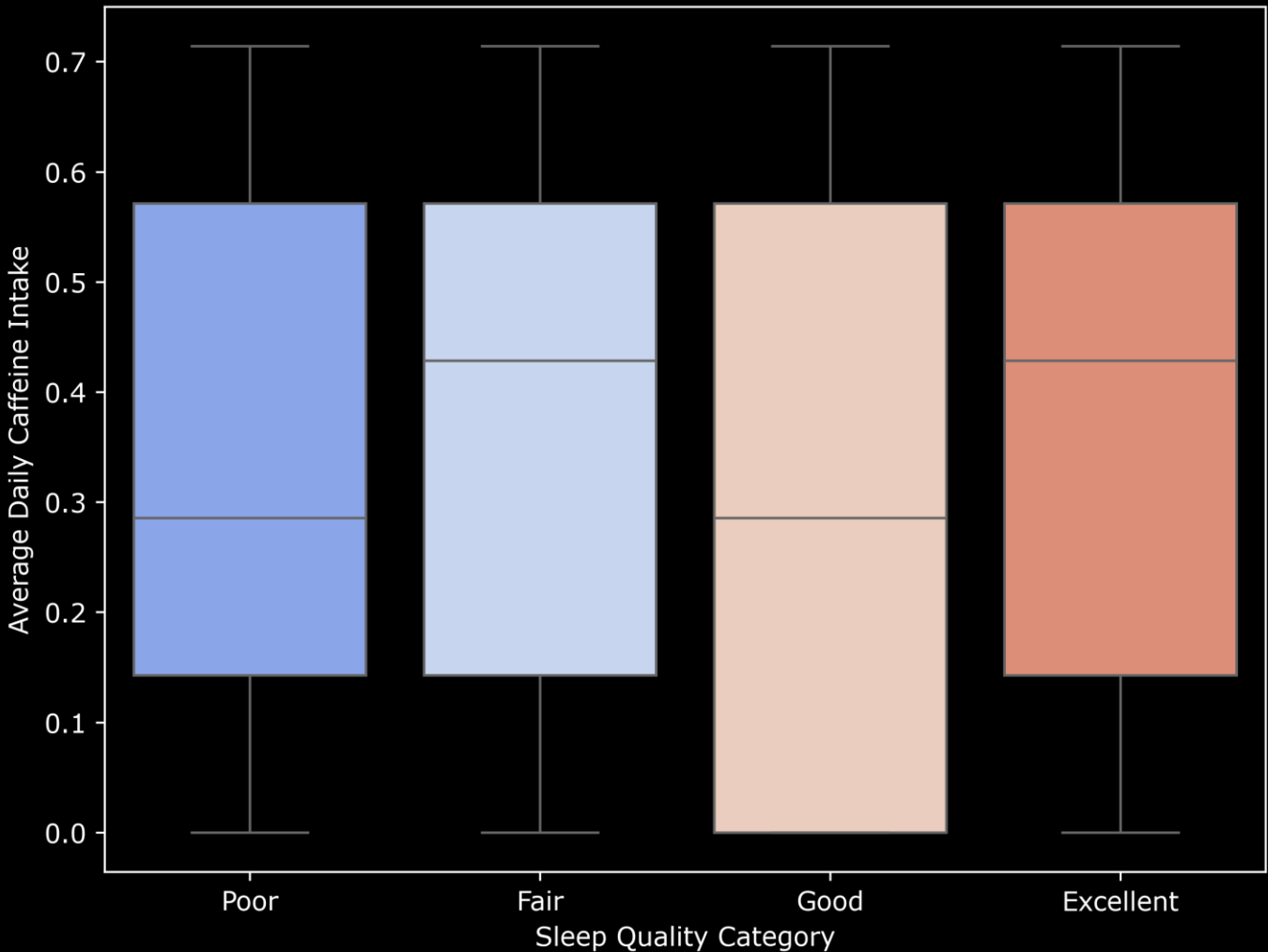


Caffeine and Sleep Quality

Caffeine Level vs Sleep Quality



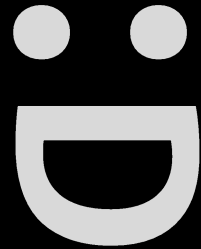
Average Daily Caffeine Intake vs Sleep Quality



CONCLUSION

- ✓ In conclusion, sleep quality is a crucial yet often overlooked factor in students' academic success and overall well-being.
- ✓ Through understanding sleep patterns, we see the strong connections between good sleep, cognitive function, and emotional health.
- ✓ Poor sleep habits, often influenced by academic pressure, lifestyle choices, and caffeine, can negatively impact memory, concentration, and stress levels.
- ✓ By recognizing the importance of healthy sleep routines, students can take proactive steps to improve their academic performance, especially in India where the work and study pressure is humongous.

THANK YOU



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