



جامعة مصر للمعلوماتية  
EGYPT UNIVERSITY  
OF INFORMATICS

Egypt University of Informatics  
Computer and Information Systems  
Data Analysis Course

# The Analysis of Caffeine on Students Performance Academically

Submitted by: Yahia Sonbol

8/3/2024

## Introduction

In college, how much you sleep and how often you drink coffee can really affect how well you do academically. Sleep is important for thinking clearly, and coffee helps you stay awake. This study looks at how these two things are connected and how they affect how well students do in school. We'll check out what other researchers have found and do some of our own research to understand how sleep, coffee, and grades are all linked. This could help us figure out ways to help students do better in school by getting enough sleep and managing their coffee intake.

## Research Question

How can caffeine intake affect students grades?

## Hypothesis

We hypothesize that there is a significant relationship between sleep habits, coffee consumption, and academic performance in college students. Specifically, we expect that students who report better sleep habits, characterized by longer duration and higher quality sleep, will also report higher academic performance. Conversely, we predict that increased coffee consumption, indicative of higher caffeine intake, will be associated with poorer sleep quality and potentially lower academic performance. Additionally, we anticipate that there may be interaction effects between sleep habits and coffee consumption, where the impact of caffeine on academic performance may vary depending on individual sleep patterns.

## Population of Interest:

EUI Students

## Sampling Method:

I used convenience sampling. Convenience sampling involves selecting individuals who are readily available and easily accessible to participate in the study, that's why it was the best sampling approach to use.

## Bias Identification:

Factors other than caffeine consumption, such as study habits, stress levels, or personal characteristics, could influence both caffeine intake and academic performance, leading to confounding effects. To reduce the biasness I added the question of how many hours do you sleep in weekdays because sleep effect stress levels and your study habits.

## Survey Questions:

[Gender]

[Year]

[Major]

[On average, how many hours of sleep do you typically get on weekdays?]

[How often do you typically have any caffeine drink in a day (tea, coffee, etc)?]

[How much would you rate your academic performance according to your grades ]

[please rate how you feel your sleep habits typically affect your focus and concentration in class.]

Online survey link: <https://forms.gle/XhhVWA5RBUXUbLgr7>

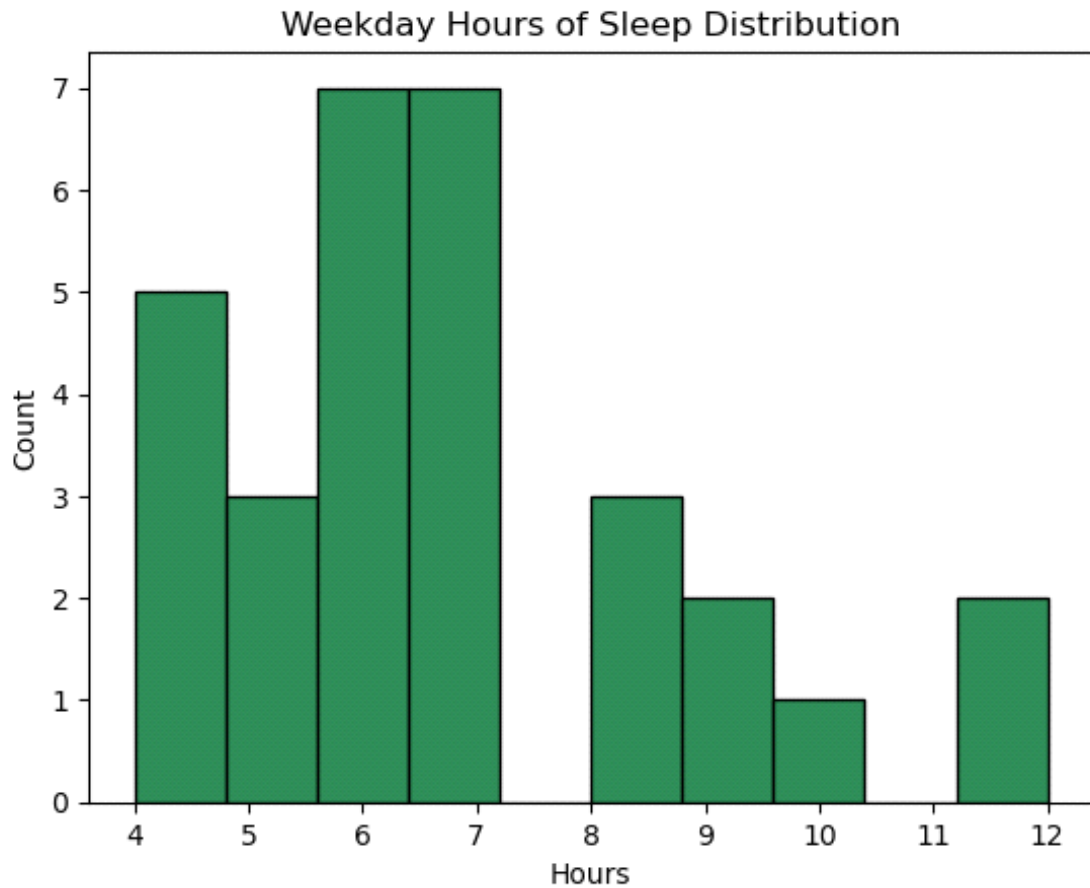
Number of samples collected: 30

## Analysis:

On average EUI students sleeps for 7 hours on weekdays.  
On average EUI students consume around 1 drinks per day.  
EUI students have a sleep median of 6.5 hours on weekdays.  
EUI students median consumption of caffeine drinks is around 1 drink per day.  
7 EUI students sleeps for 6 hours per day.  
16 EUI students drinks 1 cups per day.

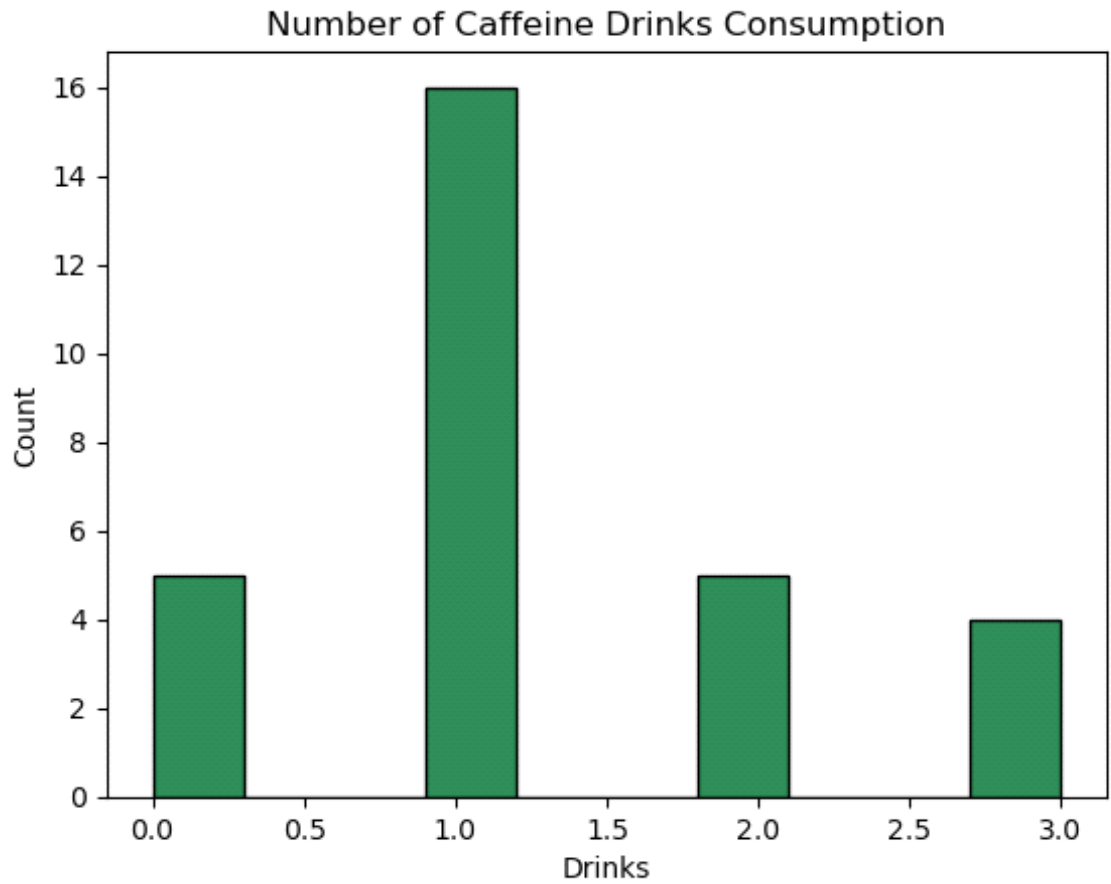
**Average Sleep Duration:** The sentence states that, on average, EUI students sleep for 7 hours a night. This suggests that the typical amount of sleep obtained by these students falls within the range recommended by sleep experts for adults, which is generally between 7 to 9 hours per night for optimal health and cognitive function.

**Caffeine Consumption:** The sentence also indicates that EUI students consume, on average, one caffeinated beverage per day. Caffeinated beverages commonly include coffee, tea, energy drinks, and some soft drinks. This level of caffeine intake suggests that many students rely on caffeinated beverages to help them stay alert and focused throughout the day, possibly due to factors such as academic demands, social activities, or personal preferences.



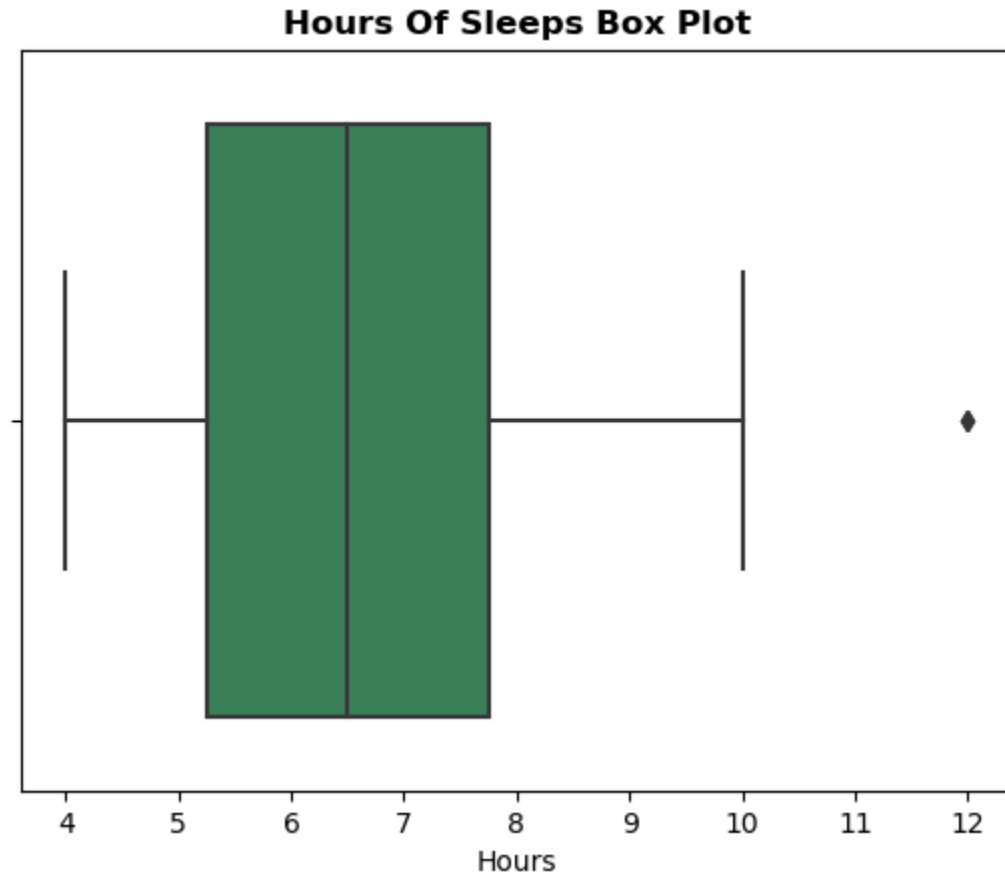
The x-axis of the graph shows hours of sleep, ranging from 4 to 12. The y-axis shows the count, likely referring to the number of students. The vertical bars on the graph show the distribution of sleep times.

There are two clusters of students who tend to sleep: between 6 and 7 hours, and between 9 and 10 hours. Fewer students sleep at other hours.



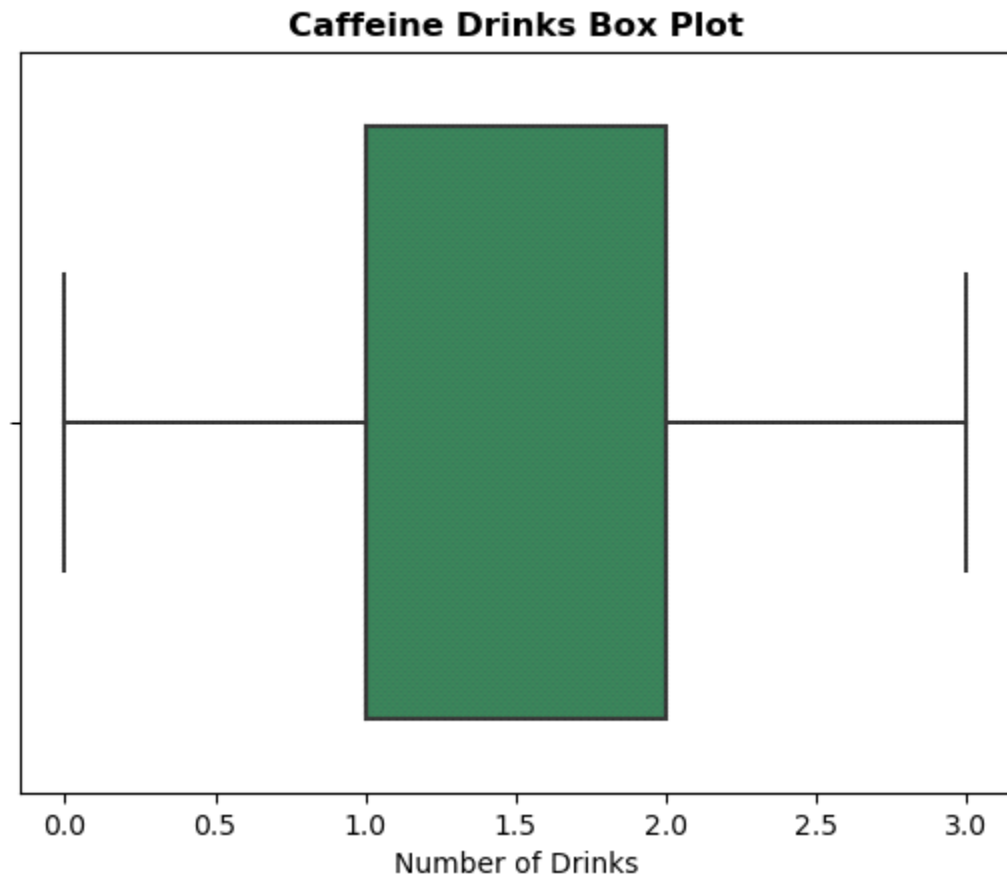
The x-axis of the graph shows the number of drinks consumed, ranging from 0 to 3. The y-axis shows the count, likely referring to the number of students. The vertical bars on the graph show the distribution of caffeine drink consumption.

Most students consume around 1 caffeinated drink per day. Fewer students drink 0 drinks, 2 drinks, or 3 drinks per day.

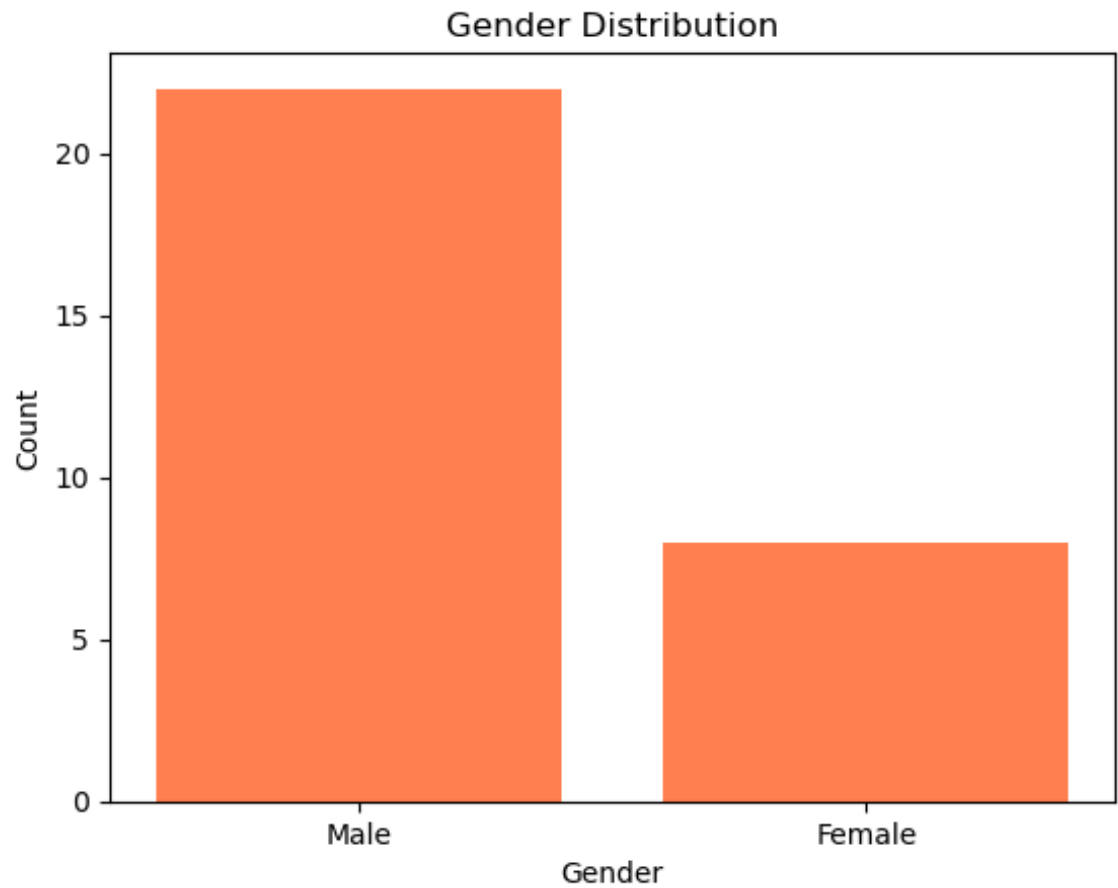


The box in the center of the plot represents the middle 50% of the data, with a line drawn through the middle representing the median. The lines extending from the box, called whiskers, represent the upper and lower quartiles of the data.

The x-axis of the chart is measuring hours of sleep. The scale goes from 4 to 12 hours. There are outliers in the data at both ends of the scale, represented by the points beyond the whiskers.

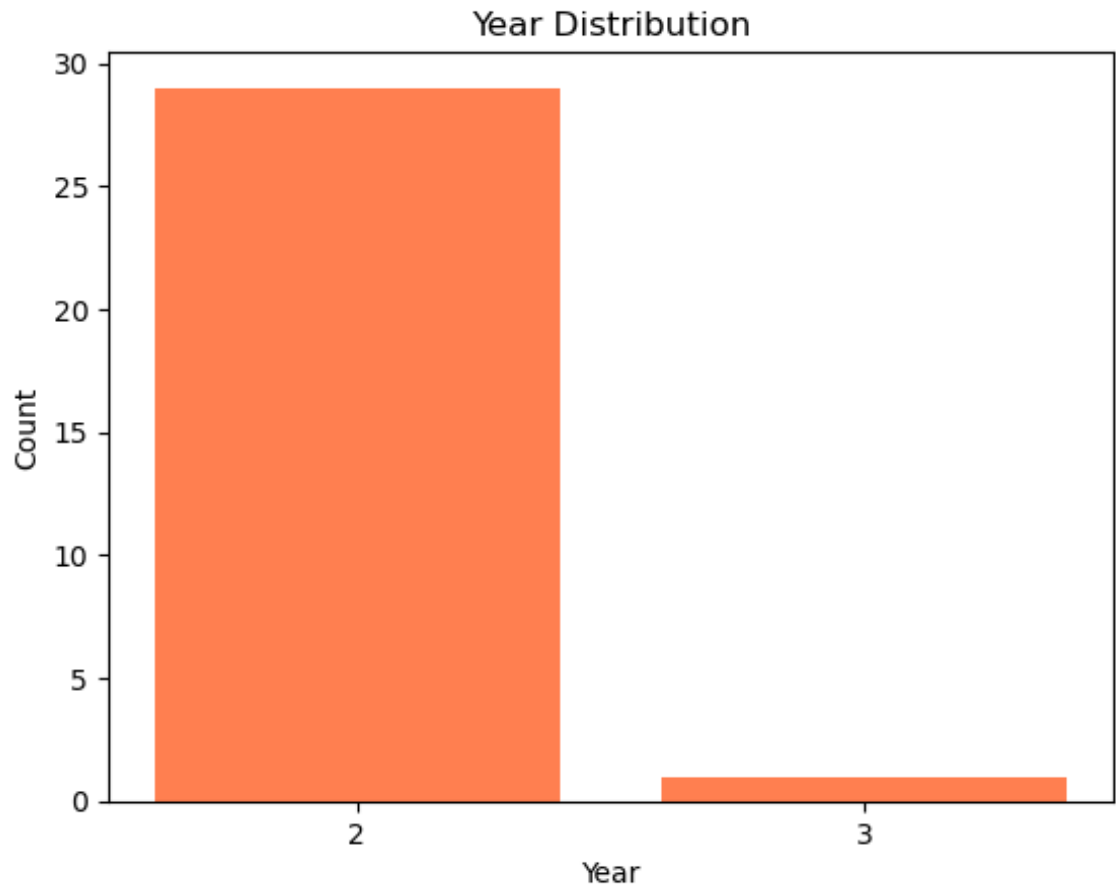


The vertical axis of the graph shows the number of drinks, ranging from 0.0 to 3.0 drinks. The lines extending from the box, called whiskers, represent the upper and lower quartiles of the data.

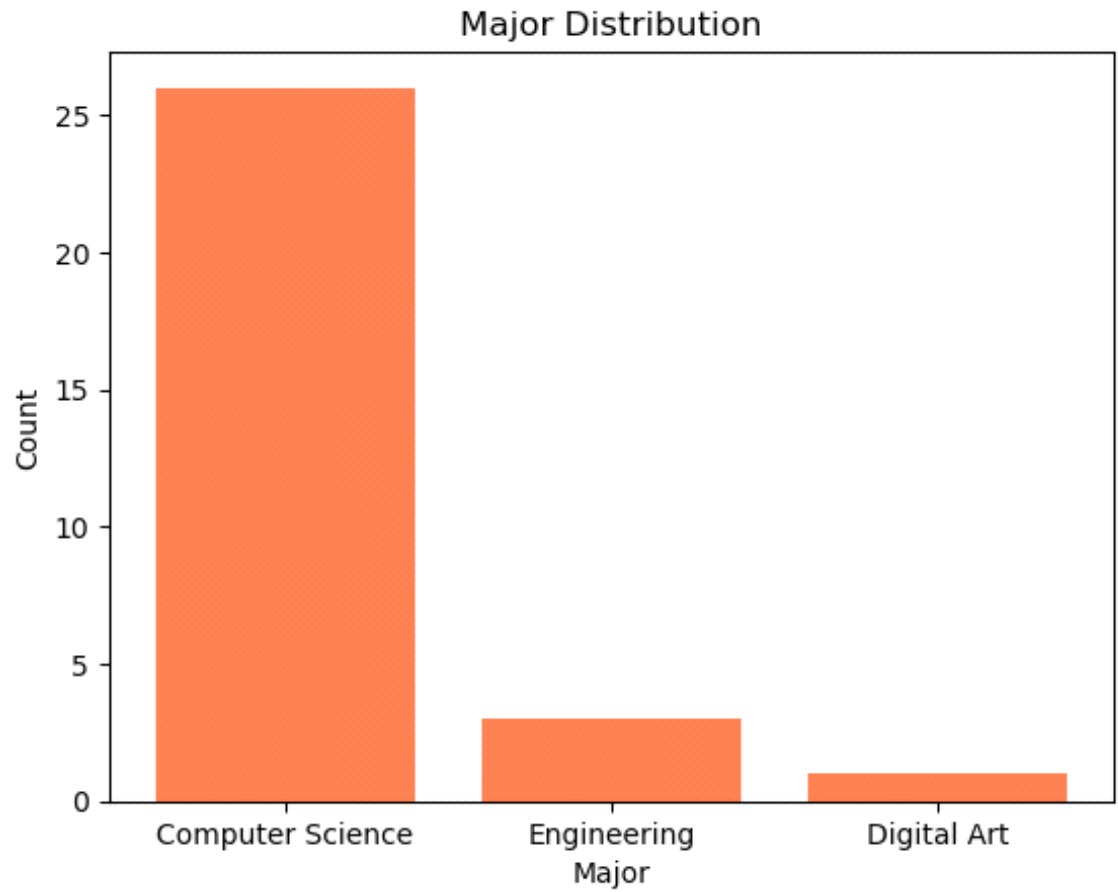


The y-axis labeled "Count" shows the number of people. The x-axis labeled "Gender" shows "Male" and "Female". The values for the y-axis aren't labeled but the heights of the bars correspond to the number of people in each group. For example, the bar for males is taller than the bar for females, so there are more males than females.

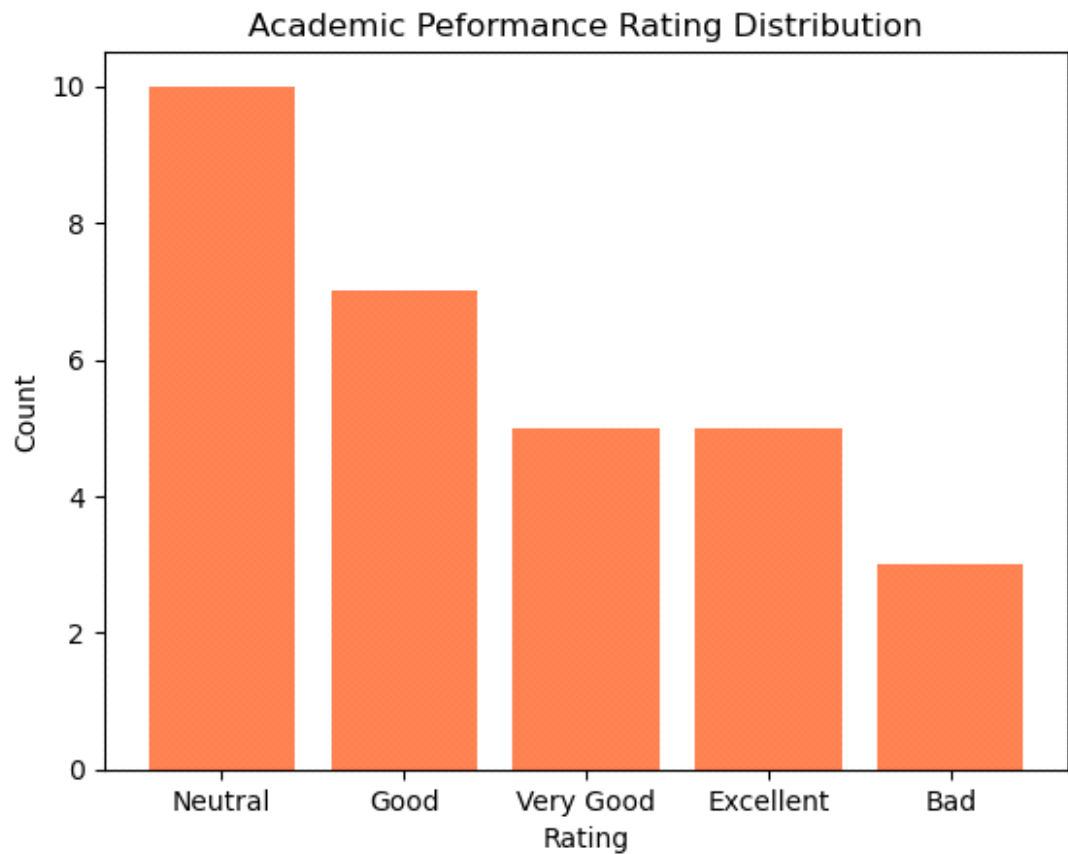




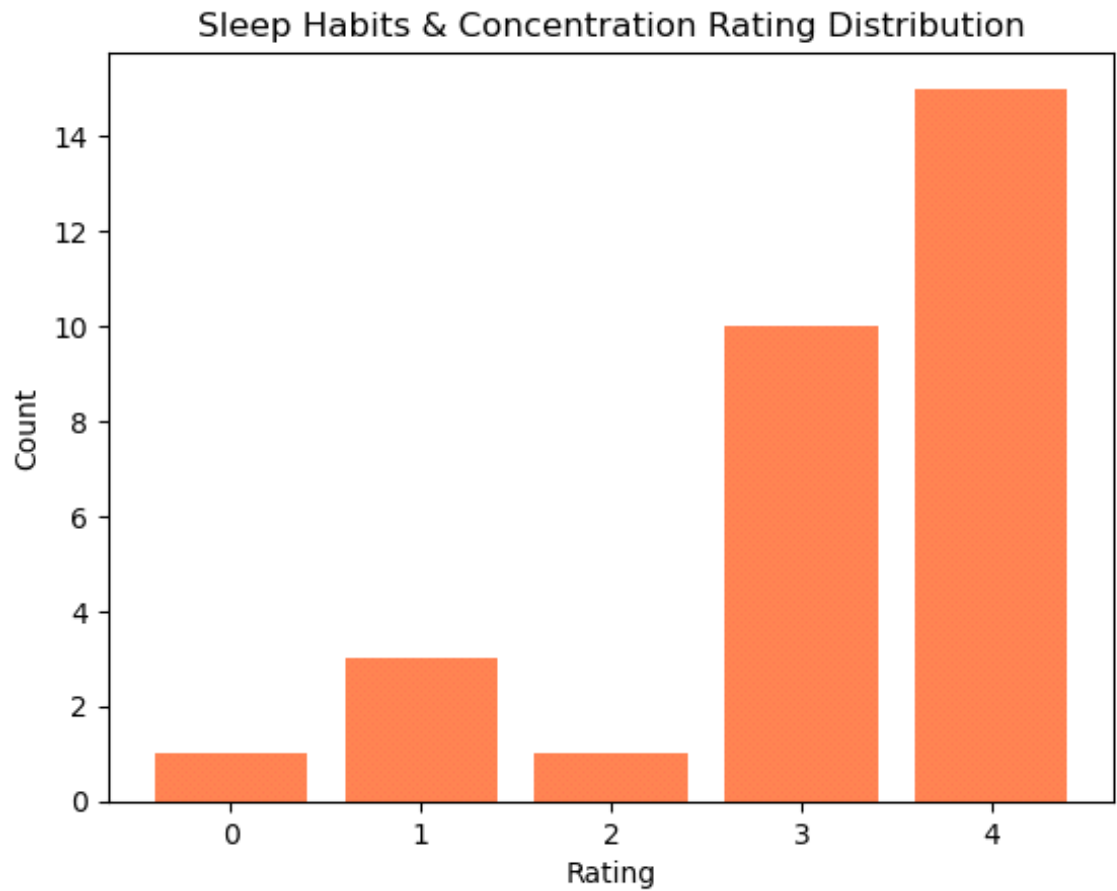
The x-axis of the graph shows the year, ranging from 2 to 3. The y-axis shows the count, likely referring to the number of students



The x-axis of the graph shows the majors, which are computer science, engineering, and digital art. The y-axis shows the count, referring to the number of students.



The x-axis of the graph shows the academic performance rating, which goes from “Bad” to “Excellent”. The y-axis shows the count, referring to the number of students. Most of the students received a rating of “Good” or “Very Good”. There are fewer students who received a rating of “Excellent” or “Bad”. It appears there are very few students who received a rating of “Neutral”



The x-axis of the graph shows the rating of how the EUI students see that sleep affect their concentration , which goes from 0 to 4. The y-axis shows the count,referring to the number of students.Most of the students received a rating of 3 or 4.

$-0.02491450309173122$

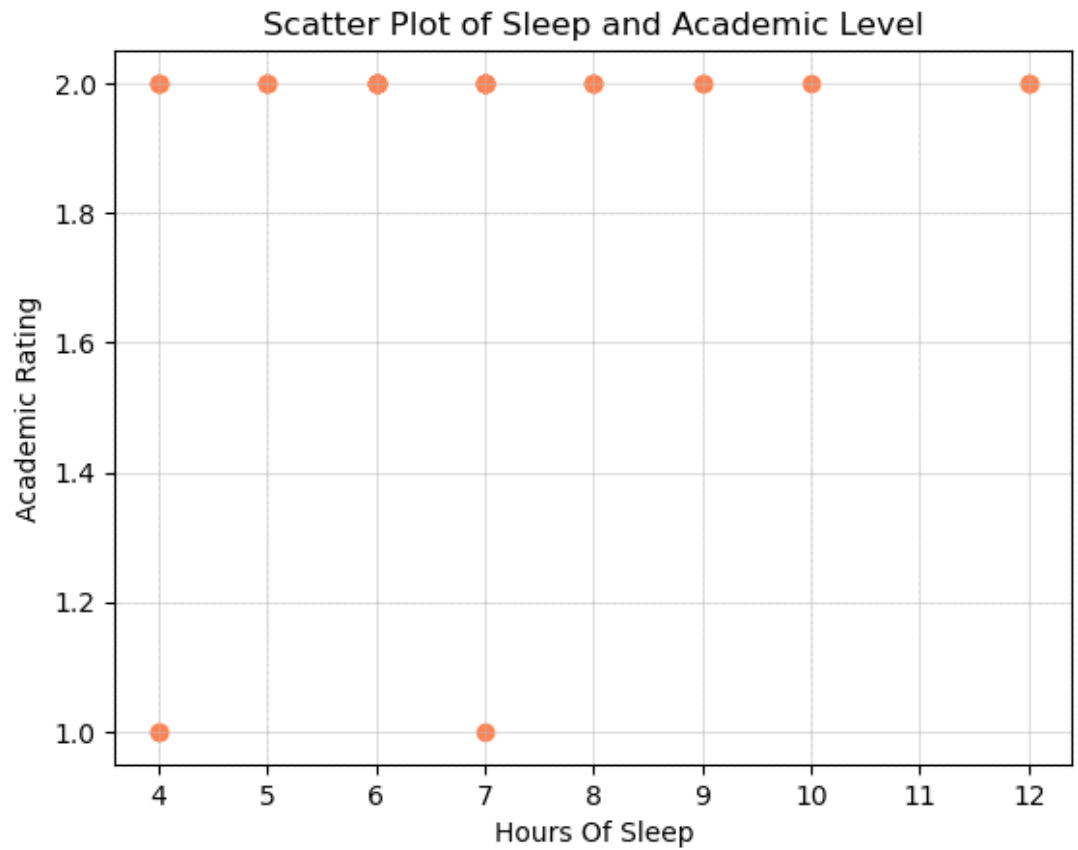
The correlation between academic rating and caffeine drinks.We get a negative weak correlation .

$0.27558396699118715$

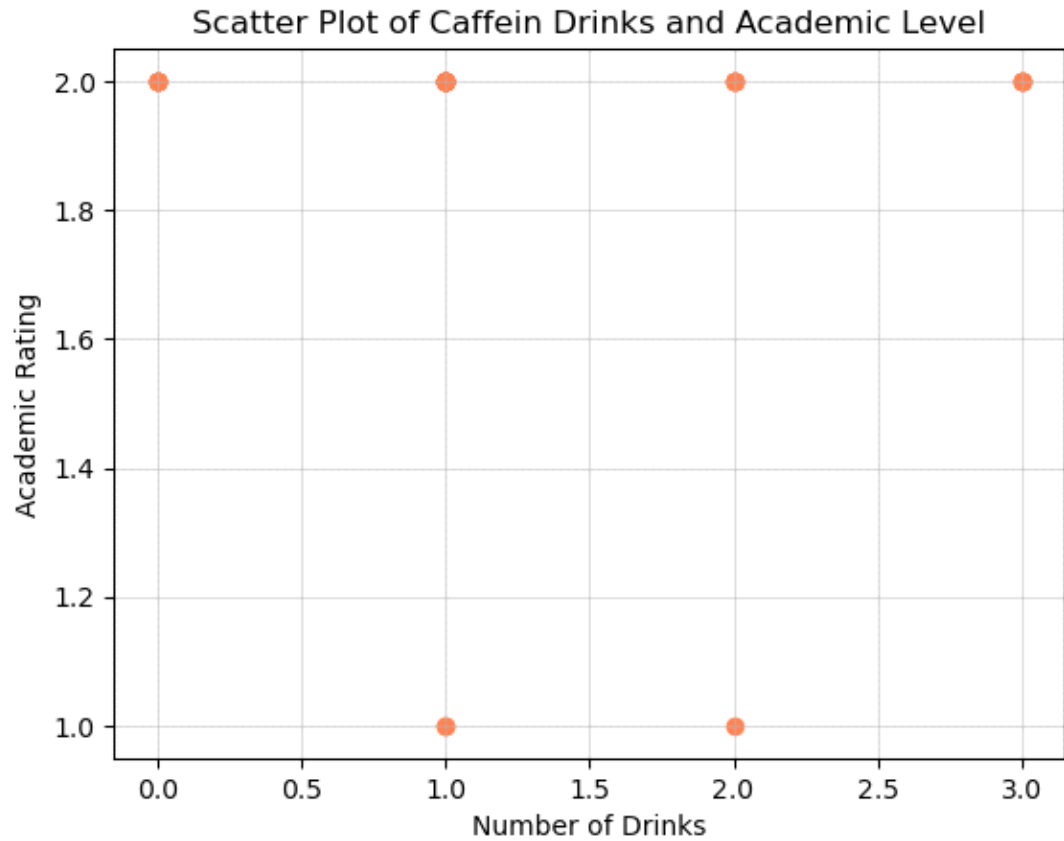
The correlation between academic rating and how many hours do they sleep.We get a positive weak correlation .

$-0.08674974426240759$

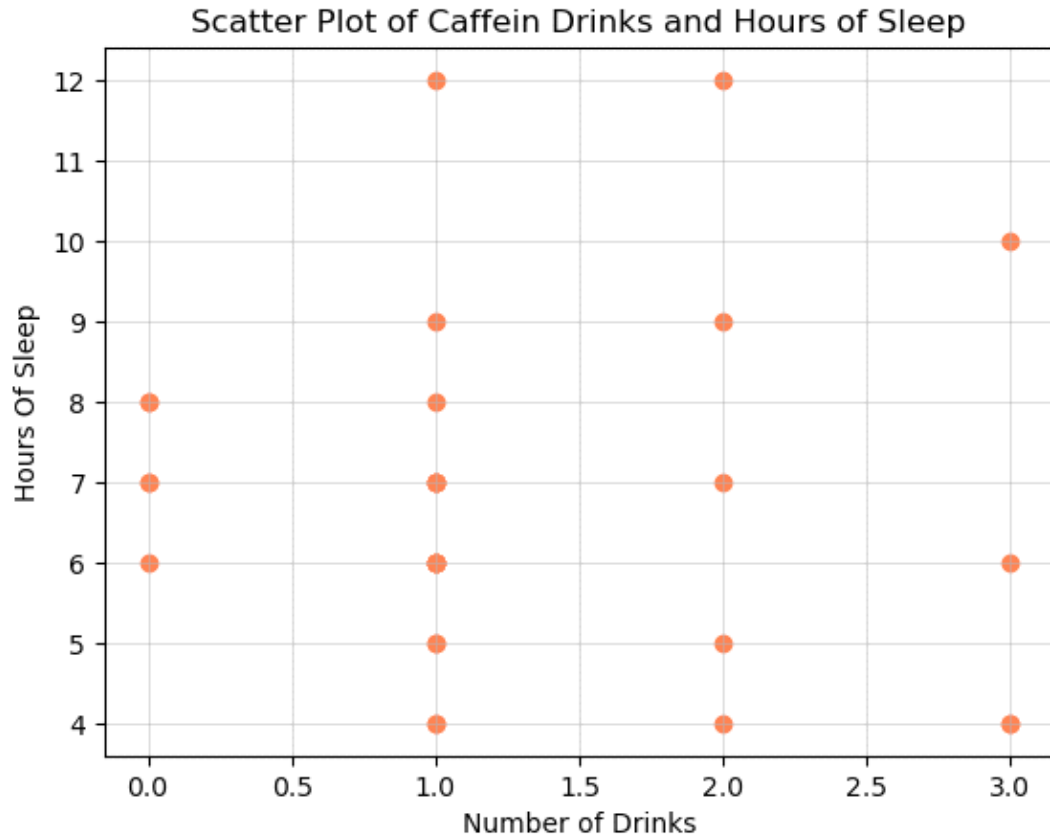
The correlation between how many hours do they sleep and caffeine drinks.We get a negative weak correlation .



The text on the axes of the plot indicates that it is plotting sleep hours and academic level. Academic level is measured on a scale from 1.0 to 2.0. Sleep hours range from 4 to 12 hours. There is a slight negative trend in the data, which means that there is a weak correlation between the two variables.



The x-axis labeled "Number of Drinks" shows a range of caffeine drink consumption from 0.0 to 3.0 drinks. The y-axis labeled "Academic Rating" shows a range of academic achievement from 1.0 to 2.0. There is a weak positive correlation between the two variables.



The x-axis labeled "Number of Drinks" shows a range of caffeine drink consumption from 0.0 to 3.0 drinks. The y-axis labeled "Hours of Sleep" shows a range of sleep duration from 4 to 12 hours. According to the scatterplot we found that there were a weak correlation.

## Conclusion

Based on the collected data, our analysis reveals weak correlation between the number of hours of sleep reported by students and their caffeine consumption habits with their academic grades, suggesting that factors beyond sleep duration and caffeine intake may play a more influential role in determining student's academic performance.

## Any potential issues

The survey was sent to the persons only who were in the EUIANS Whatsapp group and the majority of the people who filled the form were Computer Science students.