Survey on sleeping habits and academic performance

Introduction:

In the whirlwind of college, sleep often takes a backseat. But behind the late-night cram sessions and social events lies a crucial truth: sleep is essential for academic success. In this report, we delve into the relationship between sleep habits and academic performance among college students. Join us as we uncover the importance of a good night's rest in navigating the challenges of collegiate life.

Population of interest:

College students enrolled in universities.

Sampling Method:

We will use a combination of convenience sampling and snowball sampling. The survey link will be shared within university communities to ensure diversity, we will target students from various academic disciplines and institutions I send it to students from about 6 faculties and used wp groups to send on the link to make sure it is for university students.

Bias Identification:

Self-selection bias may be present as individuals who are more interested in the topic of sleep may be more likely to participate. Additionally, there could be recall bias when respondents report their average hours of sleep. To address these biases, we will emphasize the importance of participation from a wide range of students and frame questions in a neutral and non-leading manner.

Survey questions:

1)On average, how many hours of sleep do you get per night during the week (Sunday-Thursday)?

2) How would you rate the quality of your sleep?

3) Have you ever experienced difficulty concentrating in class due to lack of sleep?

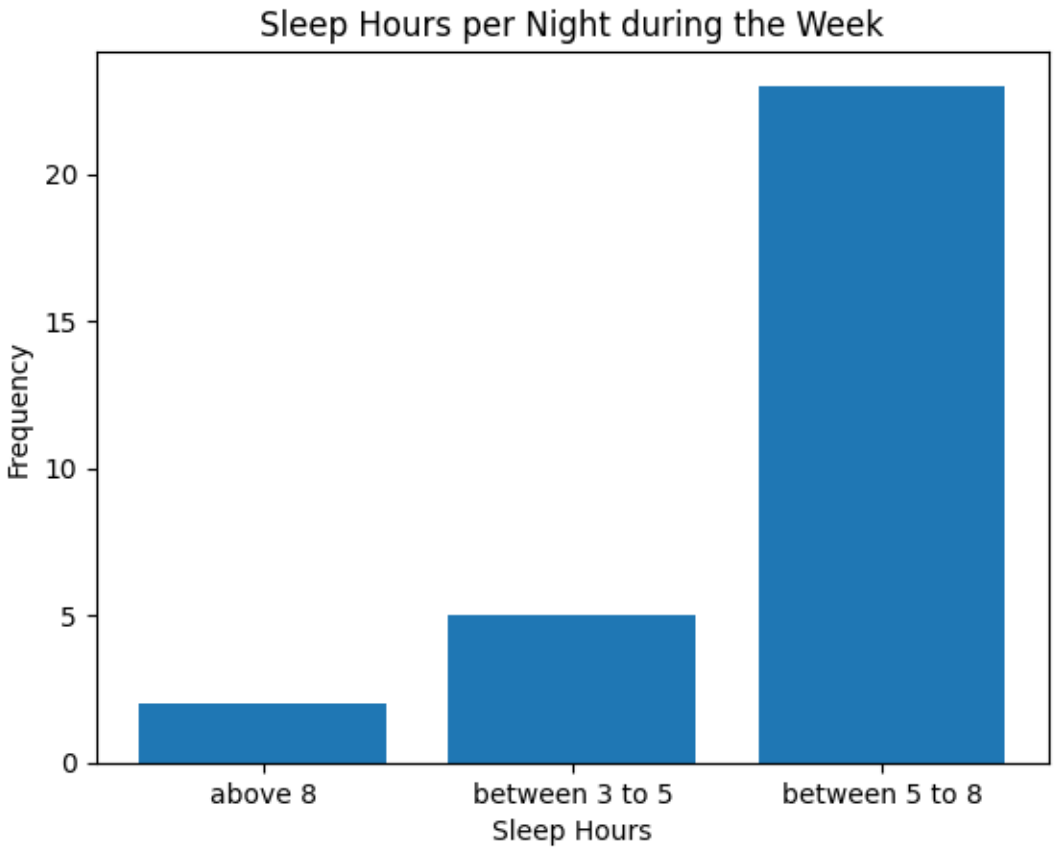
4) What is your current Cumulative Grade Point Average (CGPA) on a scale of 0 to 4.0?

5) How often do you feel tired or fatigued during the day as a result of poor sleep?

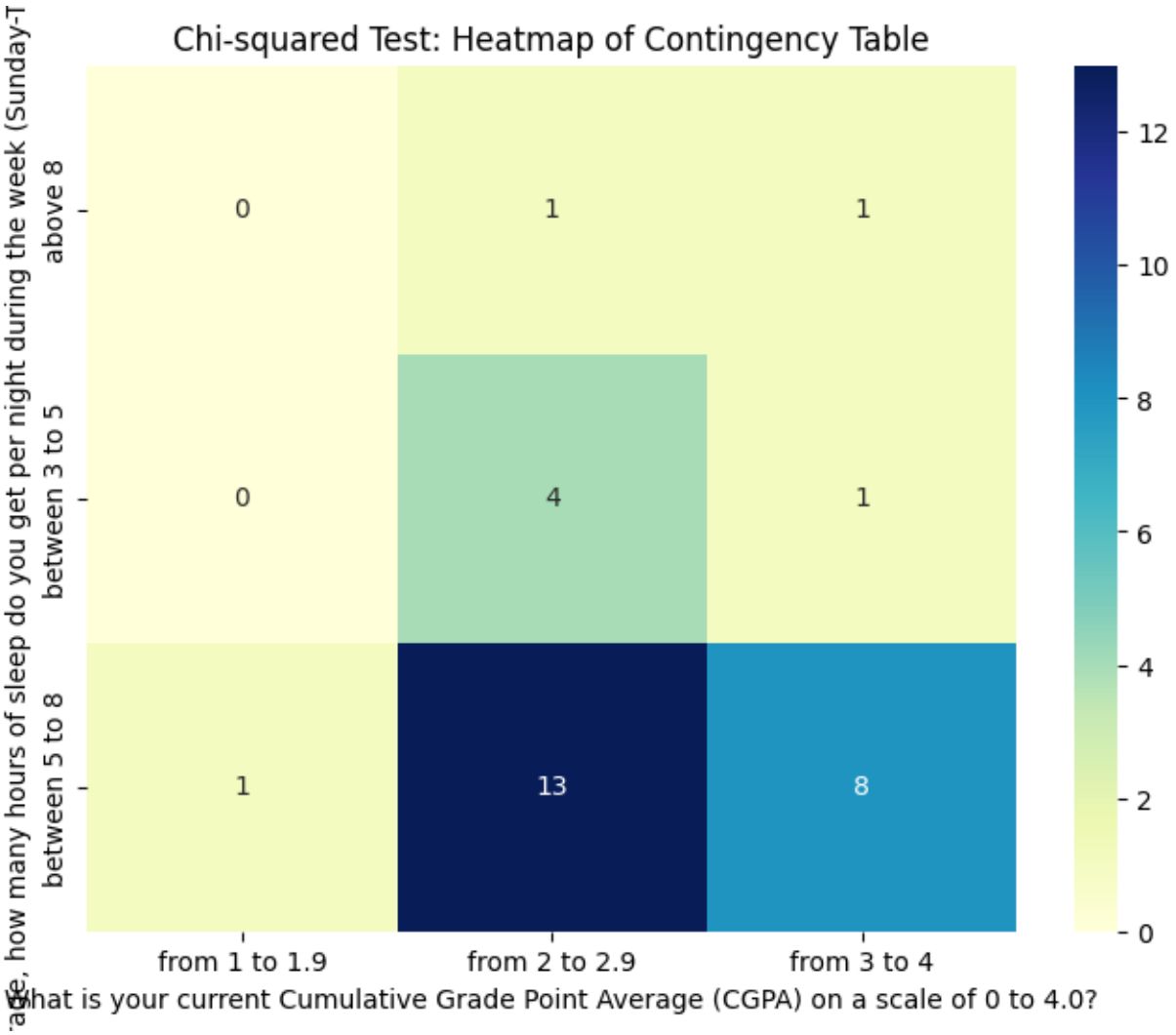
Online survey link: https://forms.gle/vwZPnSmFHa1txCgv5

Number of samples collected: 30

Analysis:



Chi squared:



1. **Chi-square statistic (χ^2)**: In this case, the chi-square statistic is approximately 1.12.
2. **p-value**: The p-value associated with the chi-square statistic is approximately 0.891.
3. **Degrees of freedom**: The degrees of freedom (df) indicate the number of independent values or quantities that can be assigned to a statistical distribution. In this case, the degrees of freedom are 4.
4. **Expected frequencies**: The expected frequencies represent the values that would be expected in each cell of the contingency table under the null hypothesis (i.e., if there were no relationship between the two categorical variables being compared)

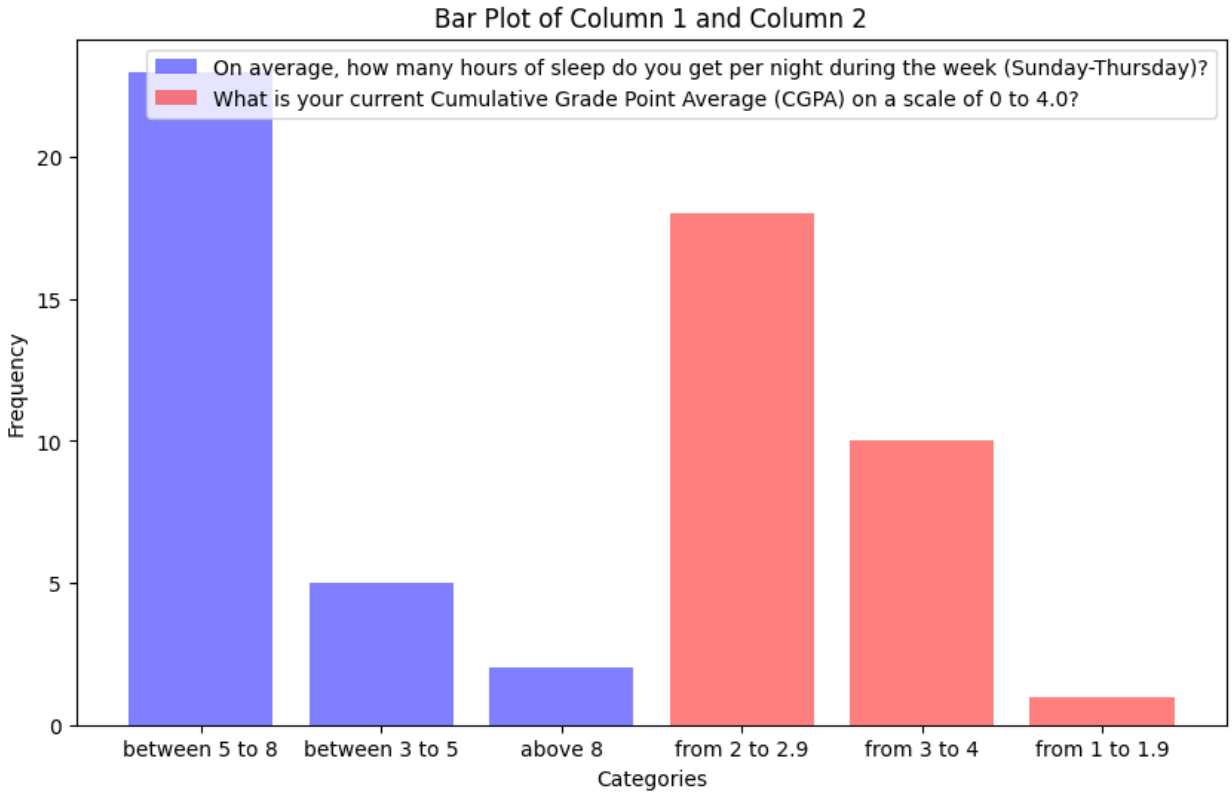
Conclusion of chi squared:

- **Chi-square statistic**: The chi-square statistic measures the extent of the association between the categorical variables. A higher value indicates a stronger association. In this case, the chi-square statistic is relatively small, suggesting a weak association between the variables.
- **p-value**: The p-value indicates the probability of observing the data or more extreme data under the assumption that the null hypothesis is true. A small p-value (typically < 0.05) suggests that there is evidence to reject the null hypothesis and conclude that there is a significant association between the variables. Conversely, a large p-value suggests that there is insufficient evidence to reject the null hypothesis. Here, the p-value is large (0.891), indicating that we fail to reject the null hypothesis. In other words, there is no significant association between the variables.
- **Degrees of freedom**: In this case, the degrees of freedom are 4, which is calculated based on the number of categories in each variable. Degrees of freedom are important for determining the critical value of the chi-square statistic from the chi-square distribution.
- **Expected frequencies**: These are the expected counts for each cell in the contingency table under the assumption of independence between the variables. They are calculated based on the marginal totals of the observed frequencies. Comparing the expected frequencies to the observed frequencies can provide insight into whether the observed frequencies deviate significantly from what would be expected under the null hypothesis.

Overall result:

Ther is no significant association between the two categorical variables.

Bar plot between the relation of sleeping hours and the GPA:



Conclusion: we see that the majority of students sleeps between 5 to 8 hours and the majority of students CGPA is between 2 and 2.9

Any potential issues:

During the data collection process, one significant issue I encountered revolved around the use of categorical variables rather than quantitative ones in the survey design. The reliance on categorical variables instead of quantitative ones during data collection introduced a significant limitation, resulting in less accurate data and inhibiting the establishment of relationships between values. By categorizing responses, the survey failed to capture the full spectrum of variability and nuances inherent in the data. Consequently, this approach hindered the ability to conduct precise analyses and draw meaningful conclusions regarding the relationships between variables. The absence of quantitative measurements restricted the depth of insights gained from the data, impeding the ability to detect subtle trends or patterns. As a result, the research findings may not fully reflect the complexity of the phenomena under investigation, and the accuracy and validity of the conclusions drawn from the data may be compromised. This highlights the importance of considering the appropriateness of variable types in survey design to ensure that the data collected accurately represent the underlying phenomena and facilitate robust analyses and interpretations.