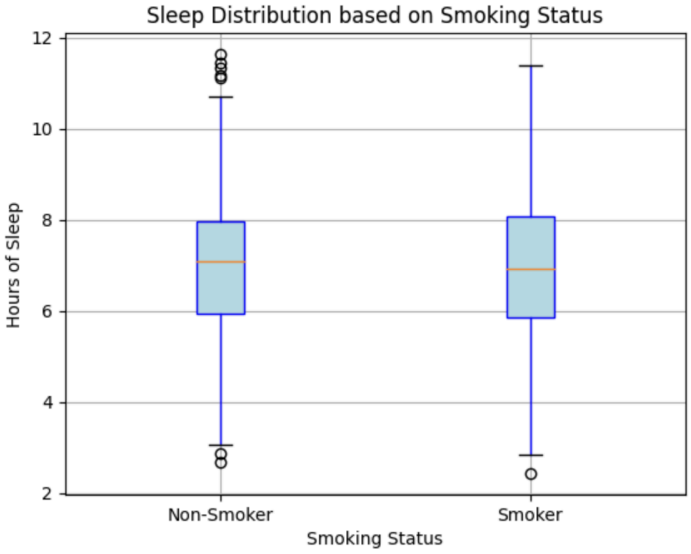
# Quant Mentorship Final Project Analysis

This analysis examines the relationships between various health factors, such as smoking status, alcohol consumption, and diet quality, on health outcomes. The dataset provides insights into how these variables impact health-related metrics, such as sleep hours and health scores.

**Question 1: Does smoking status have an effect on sleep hours?**

We are trying to analyze if smoking affects sleep using a box plot. We want to compare the summary statistics of sleep hours of smokers and sleep hours of non-smokers.

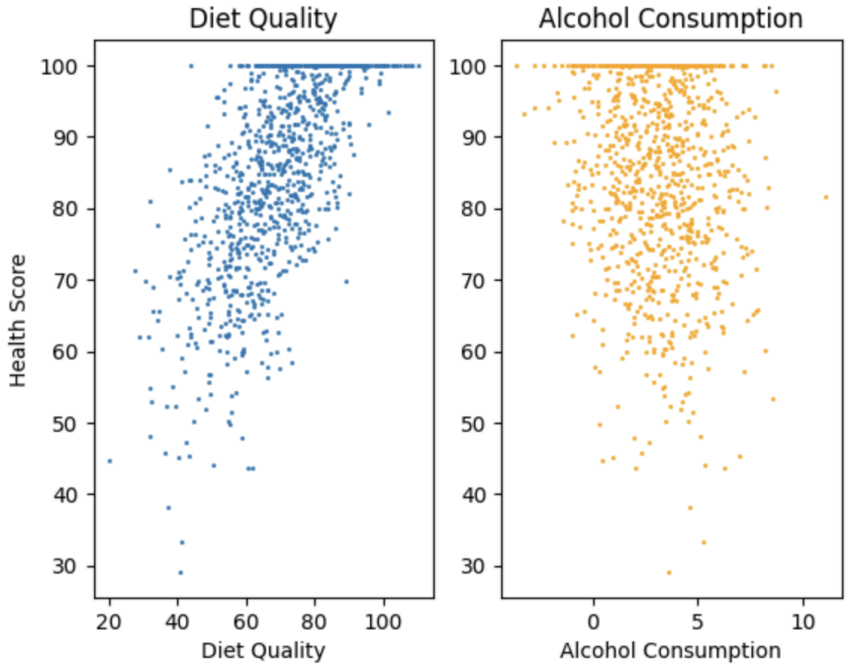



The boxplot highlights differences in sleep patterns between smokers and non-smokers. Non-smokers tend to have a higher median sleep duration and more consistent sleep hours, as seen in their narrower interquartile range. In contrast, smokers show greater variability, with a wider range of sleep hours and more outliers, indicating irregular and disrupted sleep. These patterns suggest that smoking negatively affects both the quality and consistency of sleep, potentially due to factors like nicotine dependence or other health-related impacts. This analysis reinforces the importance of not smoking for better sleep health.

**Question 2: Alcohol Consumption vs Diet Quality: Which one has a larger impact on your health?**

We are trying to analyze if alcohol consumption or diet quality has a larger impact on health score. To compare these, we create a scatter plot and compare the correlation coefficient of

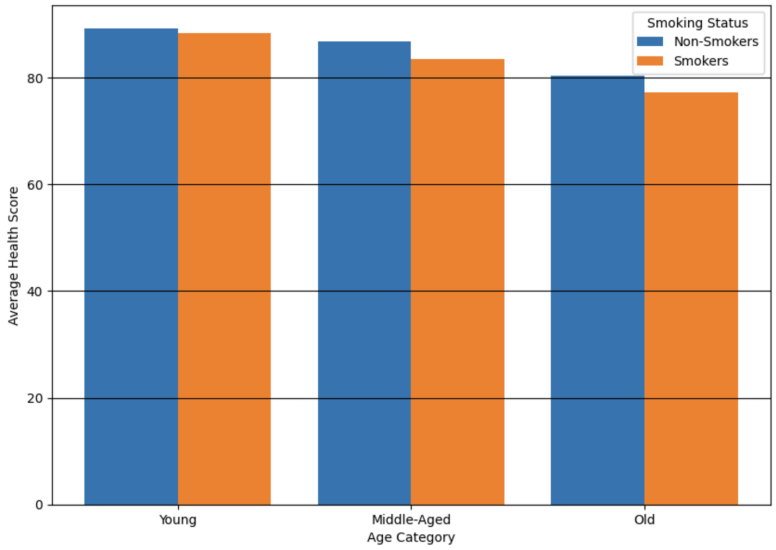
alcohol consumption vs health score and diet quality vs health score. Whichever group has a higher absolute value of correlation coefficient shows a stronger impact to one's health score.




The correlation coefficient of 0.68 between diet quality and health score suggests a moderately strong positive relationship, indicating that better diet quality is strongly associated with higher health scores. In contrast, the correlation coefficient of -0.14 between alcohol consumption and health score reflects a weak negative relationship, suggesting minimal impact. A correlation closer to 1 or -1 signifies a stronger relationship, whether positive or negative. Since 0.68 is significantly closer to 1 than -0.14 is to -1, diet quality has a much stronger influence on health scores compared to alcohol consumption. Therefore, improving diet quality appears to have a more substantial impact on health than reducing alcohol consumption.

**Question 3: How does smoking status affect health scores across various age groups?**

We want to analyze both age and smoking's impact on someone's health. To do this, we create a grouped bar graph where we can compare smoking vs non-smoking at three different age groups (Young, Middle-Aged, Old). When analyzing the graph, we want to check if there is a significant rise or decline between age groups of either smokers or non-smokers.




The grouped bar graph reveals a decline in average health scores across age categories, with younger individuals consistently achieving higher scores compared to older adults. Smoking further exacerbates this trend, as smokers consistently show lower average health scores than their non-smoking counterparts within each age group. The impact of smoking becomes more pronounced with age, as the gap between smokers and non-smokers widens significantly in older age categories. This pattern suggests a cumulative effect of aging and smoking on health, where smoking amplifies the natural decline in health associated with aging. These findings highlight the compounded risks of smoking over time.

**Summary Statistics for each variable:**

| | Age | BMI | Exercise Frequency | Diet Quality | Sleep Hours | Smoking Status | Alcohol Consumption | Health Score |
|---|---|---|---|---|---|---|---|---|
| **count** | 1000 | 999 | 999 | 999 | 999 | 998 | 999 | 998 |
| **mean** | 40.23 | 25.35 | 2.89 | 69.93 | 6.97 | 0.50 | 3.08 | 85.50 |
| **std** | 11.75 | 4.99 | 1.99 | 14.07 | 1.52 | 0.50 | 2.09 | 13.64 |
| **min** | 1.10 | 10.30 | 0.00 | 19.91 | 2.43 | 0.00 | -3.59 | 29.11 |
| **Q1** | 32.23 | 21.97 | 1.00 | 59.93 | 5.90 | 0.00 | 1.64 | 76.48 |
| **median** | 40.30 | 25.31 | 3.00 | 69.97 | 6.99 | 0.50 | 3.07 | 87.54 |
| **Q3** | 47.78 | 28.65 | 5.00 | 80.52 | 8.06 | 1.00 | 4.49 | 99.77 |
| **max** | 86.23 | 40.97 | 6.00 | 110.27 | 11.64 | 1.00 | 11.11 | 100.00 |