Design Rationale

Problem:

Given sleep's crucial role in the quality of one's life, I found it very confusing and frustrating when I would constantly wake up tired despite seemingly getting a good night of sleep, or unexpectedly waking up with a surge of energy to start the day after waking up from what seemed like would have been a horrible night. To address the confusion behind why sleep and waking up felt so confused, this solution combines a basic programming and data science approach to address this question.

Solution:

To address the problem, I first needed to do some research into sleep as a whole. From my research I learned that sleep is compromised of three cycles.

Light Sleep:

- This stage is where we spend most of the night and where muscle activity drops and the body temperature lowers

Deep Sleep

- Allows the body to repair and release essential hormones. This stage is most difficult to wake up from because of how relaxed the body becomes.

Rem Sleep

- Important for memory and refreshing the brain, playing a key role in cognitive functions.

In anticipation of this project, I slept with my Apple watch for 5 days and noted how I felt. I felt as though on days where I had the most deep sleep, were the days that waking up felt the easiest.

With these established, I wanted to uncover the patterns and gain insight into how these different amounts of sleep played a role in sleep quality, but also factor in very standard predictors of poor sleep (caffeine, lack of exercise) to create a simple sleep tracking tool.

This program will address this issue by;

- Allowing users to log their sleep and daily patterns
- Allow users to store their data
- Offer insights into how sleep habits influence sleep quality
- Use a linear regression model to predict sleep quality

Design Choice Justifications:

- Storing data in an array and then exporting to CSV currently for simplicity. This could be improved if this project had a larger scope.
- Using a linear regression model to predict the sleep quality, is a simple model and easy to configure for the task. Different models could be explored if this project was more serious.
- Simple Matplot Visualisation of Sleep Patterns as it’s a straightforward visualisation that can make the application more useful and isn’t difficult to implement.