**Final Webpage**

<https://lexiechaplin.github.io/DS4200FinalWebsite/graphs.html>

**Design Idea**

*Figure 1:*

Stronger correlations are shaded darker red (positive) or blue (negative). Sleep-related variables (like Light sleep, Asleep duration, and Sleep performance) are highlighted in purple on the axis labels. Cardiovascular indicators like Heart rate variability (HRV), Resting heart rate, and Workout Avg HR were compared to these sleep metrics.

*Figure 2:*

This dual scatter plot layout allows for side-by-side visual comparison of how RHR and HRV relate to Light Sleep Duration. Both plots use consistent axes and color encoding to maintain visual coherence and make interpretation easier. The x-axes represent RHR and HRV respectively, while the y-axis shows light sleep duration in minutes, allowing for direct comparison of the two inputs. Data points are color-coded by recovery score using a gradient blue scale to highlight how recovery levels align with sleep and heart metrics. Each point represents a daily observation, with color indicating recovery score, where darker blue suggests better recovery. A recovery score slider is added to provide interactivity. This allows users to filter the data based on recovery score and isolate trends for specific recovery ranges.

*Figure 3:*

The visualization presents box plots of HRV values (y-axis, measured in milliseconds) across three sleep stage classification groups (x-axis). Each classification group contains three color-coded box plots representing different sleep stages: dark blue for REM sleep, medium blue for Deep sleep, and light blue for Light sleep. The box plots display the median, interquartile range, distribution range, and outliers. This design enables comparison of HRV distributions both within and across sleep stage proportion categories.

*Figure 4:*

The chart displays the average sleep duration (in minutes) for three distinct sleep stages, REM, Deep, and Light sleep, across five heart rate zones. Each zone on the x-axis represents a specific heart rate intensity level experienced during physical activity. The y-axis measures the average sleep duration in minutes. Same color coding from previous is used. The interactive feature allows users to isolate and examine individual sleep stages for more detailed analysis.

*Figure 5:*

This line plot illustrates how predicted sleep durations for REM, deep, and light sleep change as time in zone 5 increases. Each line corresponds to a sleep stage, and the plot clearly highlights optimal or inflection points where small increases in zone 5 training lead to spikes or drops in sleep duration. We also added highlighted annotations to draw attention to what duration of Zone 5 cardio corresponds to the optimal duration of sleep for each stage. We kept a consistent color scheme whenever referencing REM, deep, and light sleep to maintain uniformity.