# ML Sleep Analysis Project

## Why did I do this?

Newly introduced to Machine Learning, I wanted to find a way to use the new ML skills I learned in a practical way. I could have found a dataset online and used ML algorithms to draw conclusions and make predictions, but I thought that would be boring. I believe that any work should produce meaningful and useful results. Therefore, I decided instead to use the ML knowledge I acquired to solve a problem that I was interested in personally at the time, which was regulating my sleep patterns. All my life I have struggled to maintain a "civilized" sleep schedule, and I saw this as a perfect opportunity to make progress on that front. I recorded my own sleep data for about a month, and used it as my dataset for my Machine Learning project.

## Description

For this project, I recorded data on my own sleep patterns and habits over about a month long period. This included the time I went to bed, the time I fell asleep, the time my alarm went off, the number of times I hit snooze, the time I got out of bed, and my subjective rating of my sleep (both sleep quality and overall rating of the experience) the next day. The goal of the project was to determine which aspects of my sleep routine contribute most to my subjective sleep experience, so that I could improve them in my everyday life and have better sleep.

## Overview

Feel free to visit my portfolio website and check out the code I used to complete this project! In the code there are markdown comments explaining each section. However I will briefly go over some key elements of the project for the purposes of summarization.

- I used several data preprocessing techniques to make the data suitable for an ML algorithm, including scaling and datatype conversion.
- I constructed a heatmap to find out when the best in bed and out of bed times were for me. It was clear from the visualization that 8:15-9:15 was the best get-up time range and 12-12:45 was the best bedtime range. Already I had some useful information!
- I used a Random Forest Regression model, specifically its feature importance function, to determine which sleep feature contributed most to my sleep experience.
- It turned out that the number one predictor of my sleep experience was, by a substantial margin, the number of times I hit snooze! After using the Machine Learning model I checked the correlation, and the number of times I hit snooze had a -76% correlation with my sleep experience. The model had successfully found the most influential factor in the dataset, and –for me– turned a world of possibilities into a very simple conclusion. Lesson learned, stay away from the snooze button!