DSA 210 FINAL REPORT

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The Impact of Social Media Usage on Sleep Duration

Introduction

•This project explores the impact of social media usage on sleep duration using data collected from Apple's Screen Time and Health apps.

•By analyzing total screen time, social media usage patterns, notifications, and phone pick-ups, the project aims to identify potential correlations with sleep duration.

•The findings will help in understanding whether excessive social media engagement negatively affects amount of sleep taken and provide insights on healthier digital habits.

My Hypothesis

• Null Hypothesis (H0): There is no significant relationship between social media screen time and sleep duration.

• Alternative Hypothesis (H1): There is a significant relationship between social media screen time and sleep duration.

My Dataset

• Total daily screen time: Total time spent on my phone.

• Social media usage time: Time spent on social media apps.

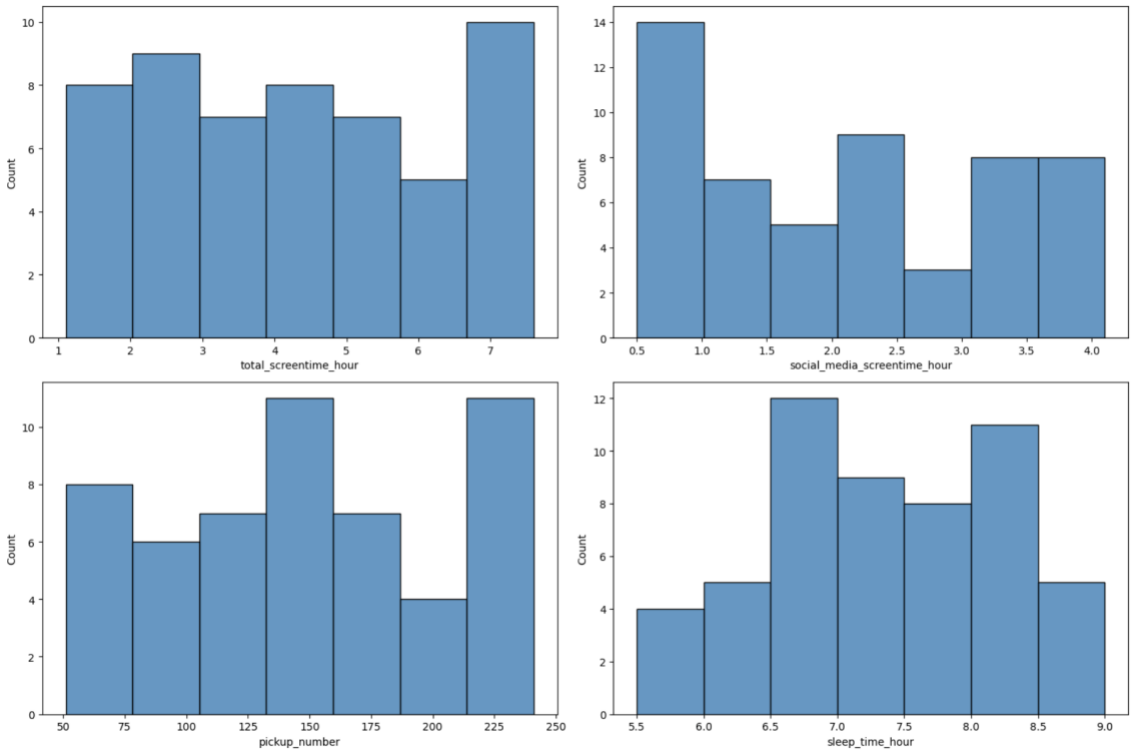
• Day of the week: To analyze trends across different days.

• Pickup number: The number of times I pick up my phone each day.

• Notifications: The number of notifications received from different social media apps.

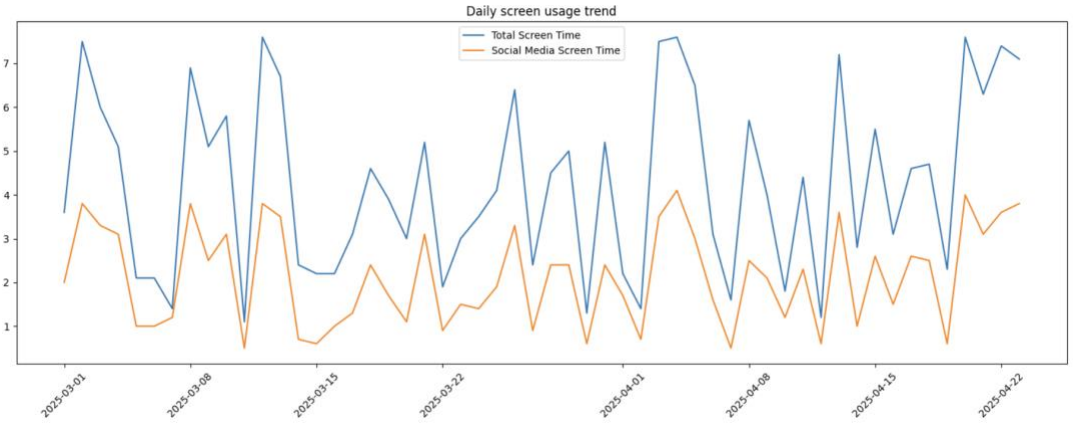
• Sleep time: Total hours of sleep recorded by the health app.

Exploratory Data Distribution for Screen Time Prediction



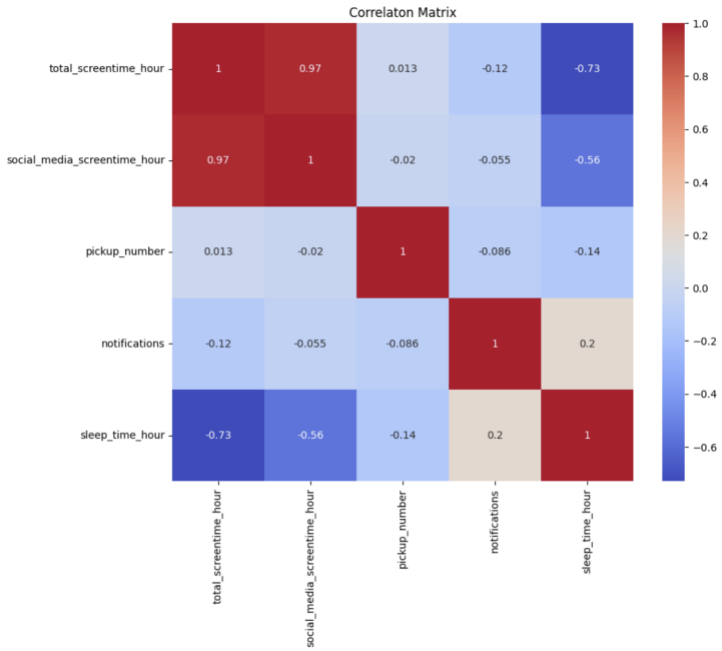
• This graph shows the distribution of my screen time data. It includes total screen time, social media use, phone pickups, and sleep hours. Most of my days fall between 2–7 hours of screen time, under 2 hours of social media use, 150–225 pickups, and 6.5–8.5 hours of sleep.

Daily screen usage trend



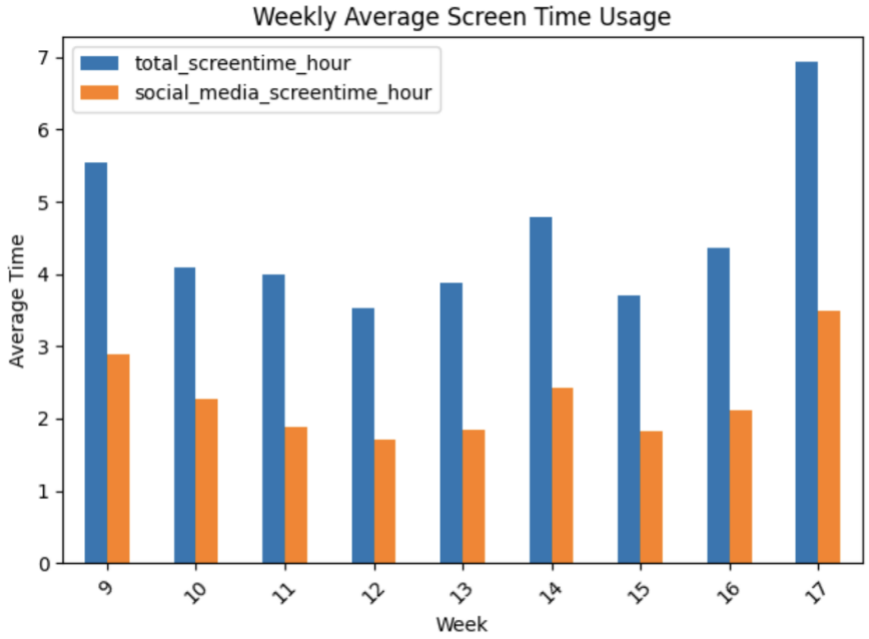
•This graph shows my daily total and social-media screen time. While both vary day to day, mid-March saw the highest total screen time overall.

Correlation Matrix Screen Time Data



•This graph shows the correlations between my screen time, social media use, phone pickup , notifications, and sleep. Total screen time is highly correlated with social media use (0.97) and strongly negatively correlated with sleep time (–0.73).

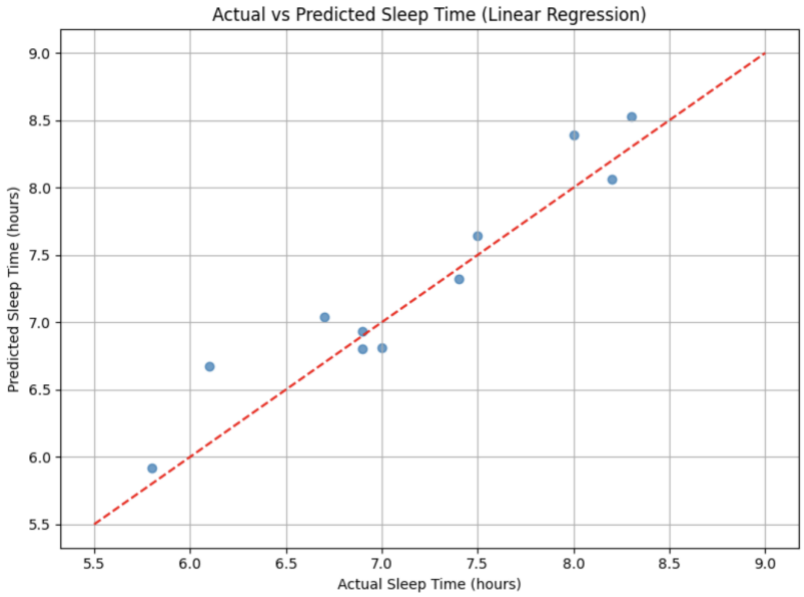
Weekly Average Screen Time Usage



•This graph shows my weekly average total and social media screen time. While both vary week to week, week 17 had the highest screen time overall.

REGRESSION ANALYSIS

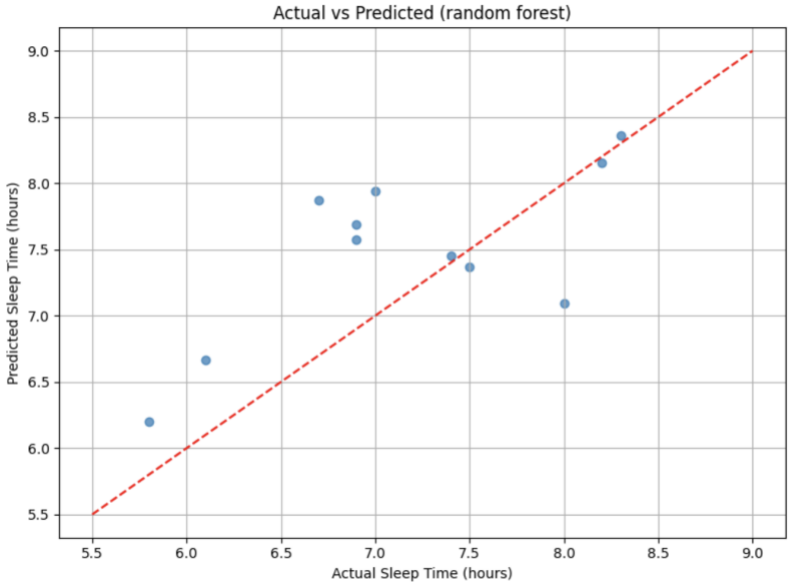
LINEAR REGRESSION



Linear regression results:

Mean Squared Error (MSE): 0.06887358777102882
R^2 Score: 0.8853054759111686

RANDOM FOREST



Random forest results:
Mean Squared Error (MSE): 0.4249807272727283
R^2 Score: 0.29228367740159467

Conclusion

The analysis shows a clear link between phone habits and sleep:

- **Correlation:** Social-media screen time and sleep duration have a Pearson r = −0.5627 ($p < 0.001$), so we reject H_0 and conclude that more social-media use is significantly associated with less sleep.
- **Linear Regression:** MSE = 0.0689, R^2 = 0.8853—this model explains ~89% of the variance in sleep time, making very accurate predictions.
- **Random Forest:** MSE = 0.4250, R^2 = 0.2923—this model captures some patterns but performs much worse overall.

In short, everyday metrics like social-media time, total screentime, pickups, and notifications reliably predict how long you sleep. Cutting back on evening screen use, especially social media and silencing non-essential alerts before bed should help in terms of boosting nightly rest.