

# IMPACT OF SCREEN TIME ON DAILY STUDY HABITS

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# DATASET OVERVIEW

- Duration: 3 months  
First Data Entry: March 10, 2025
- Variables Collected:
  - Screen time (educational & non-educational)
  - Studying hours
  - Sleep duration
  - Time spent on social activities
  - Academic responsibilities

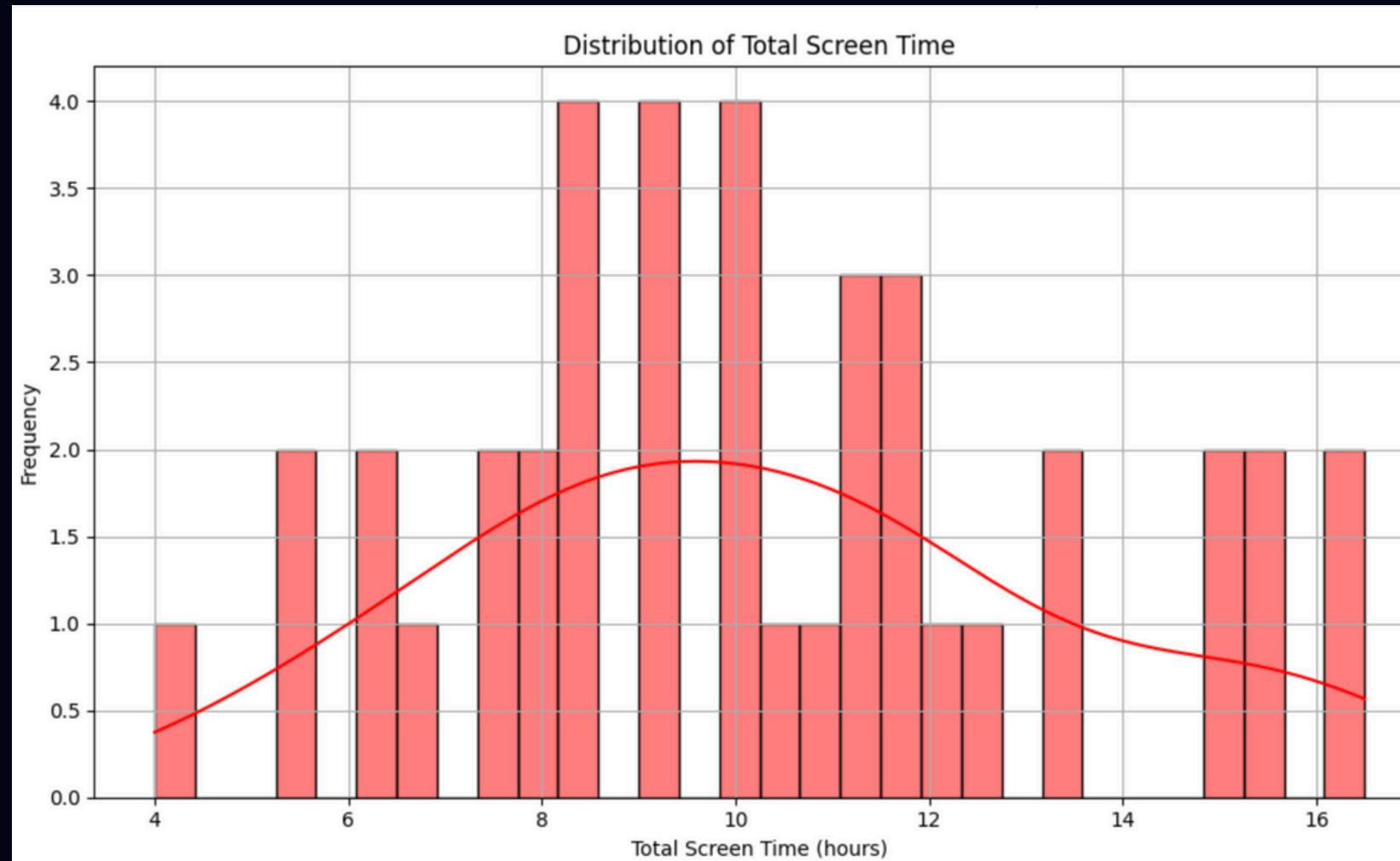


# HYPOTHESIS

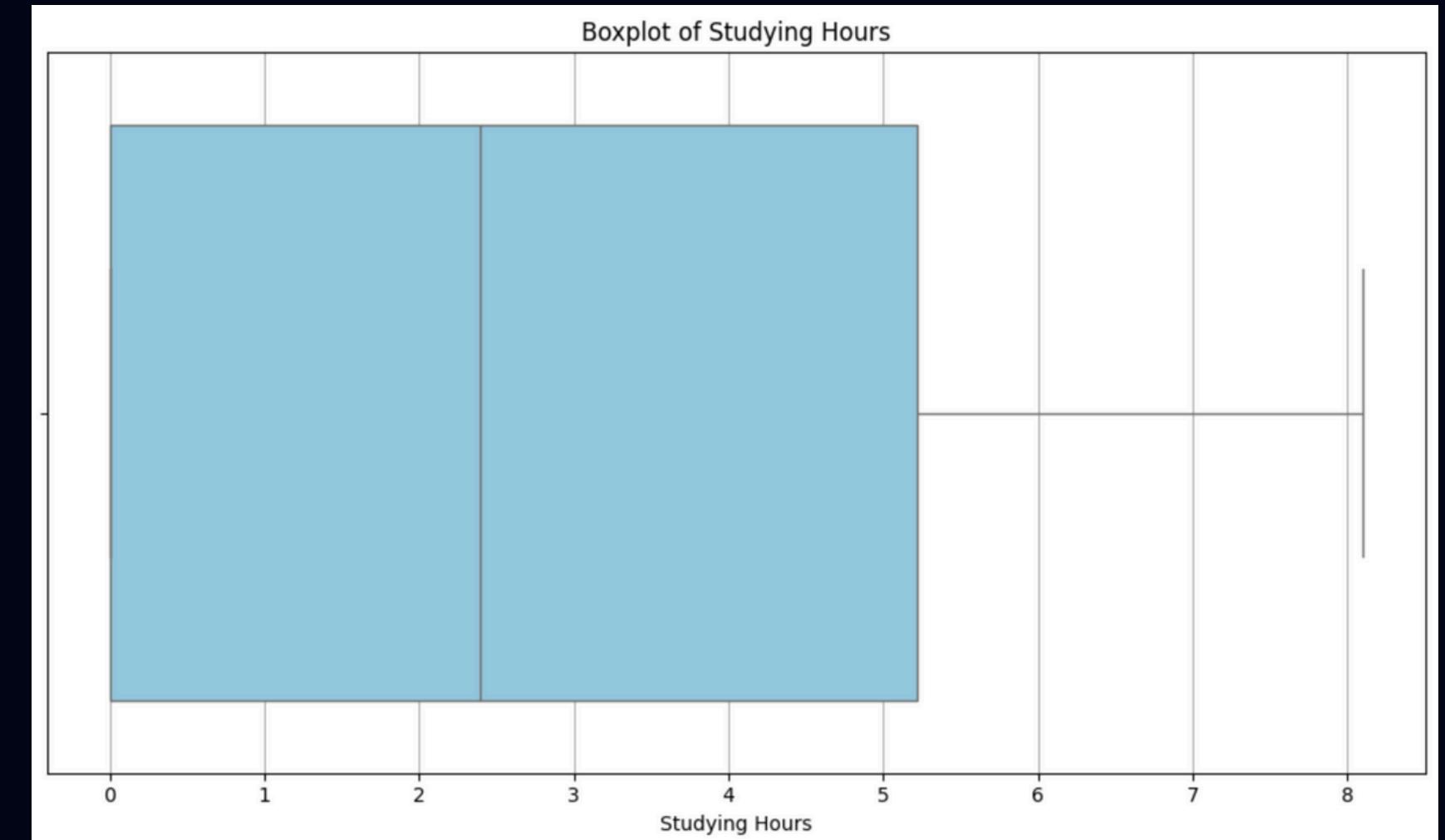
- Null Hypothesis ( $H_0$ ): There is no significant correlation between total screen time and studying hours.
- Alternative Hypothesis ( $H_1$ ): There is a significant negative correlation between total screen time and studying hours.

# Univariate Analysis

- Histogram: Total Screen Time per day  
Average total screen time: 10.27 hours



- Boxplot: Daily Studying Hours  
Average studying hours: 2.86

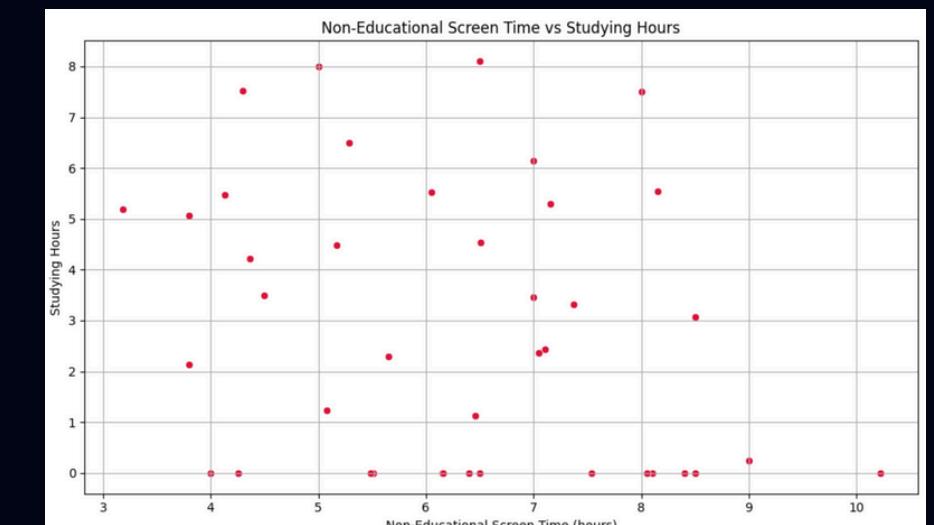
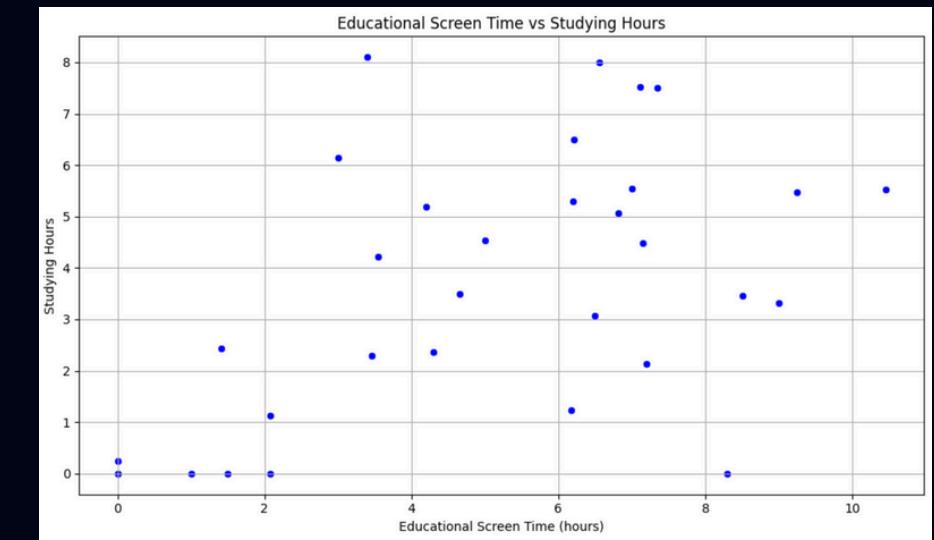
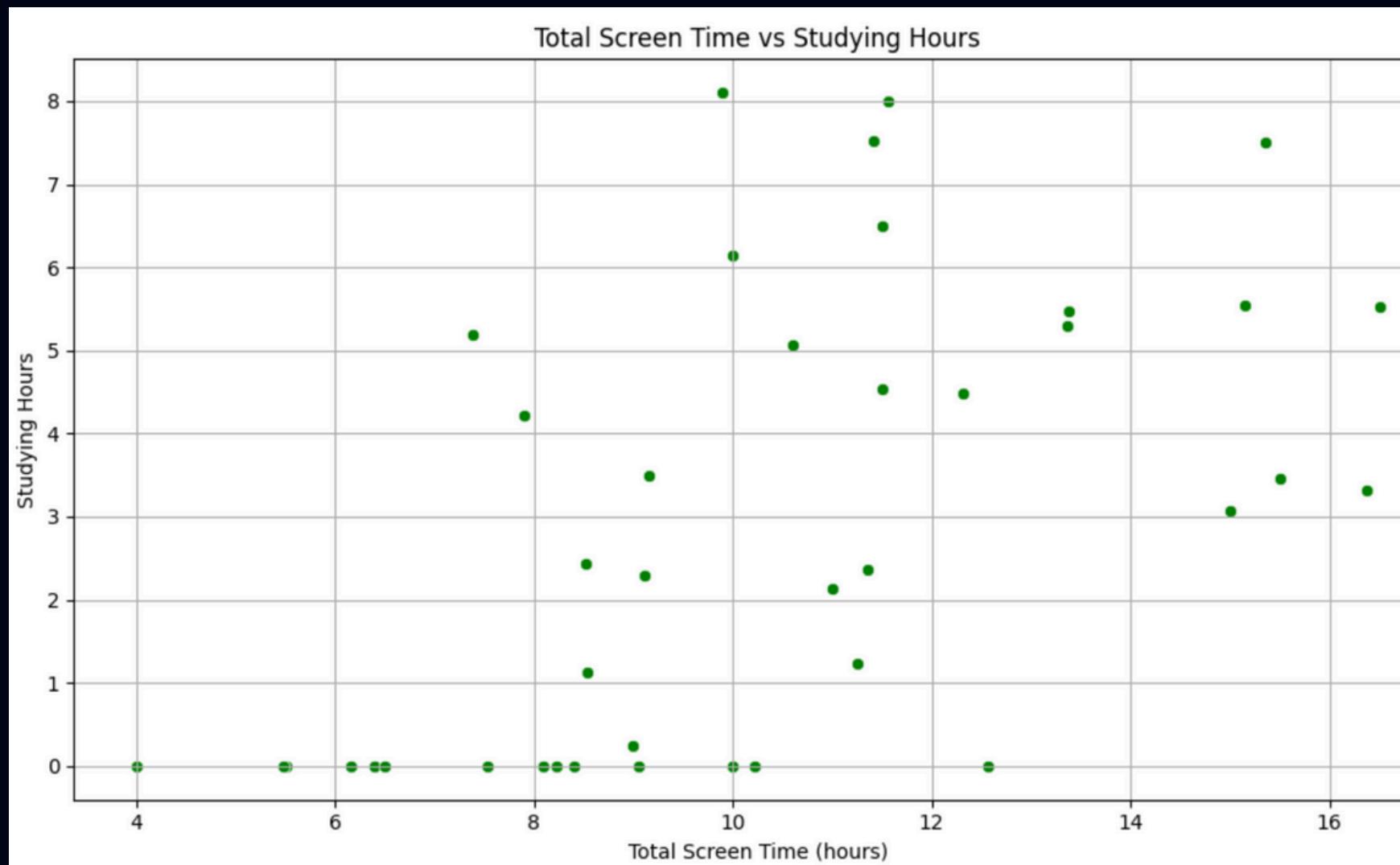


# Bivariate Analysis

- Scatterplot: Total Screen Time vs Studying Hours

A negative trend between total screen time and studying hours.  
While educational screen time shows a weak or neutral effect, non-  
educational screen time is more strongly associated with reduced study time.

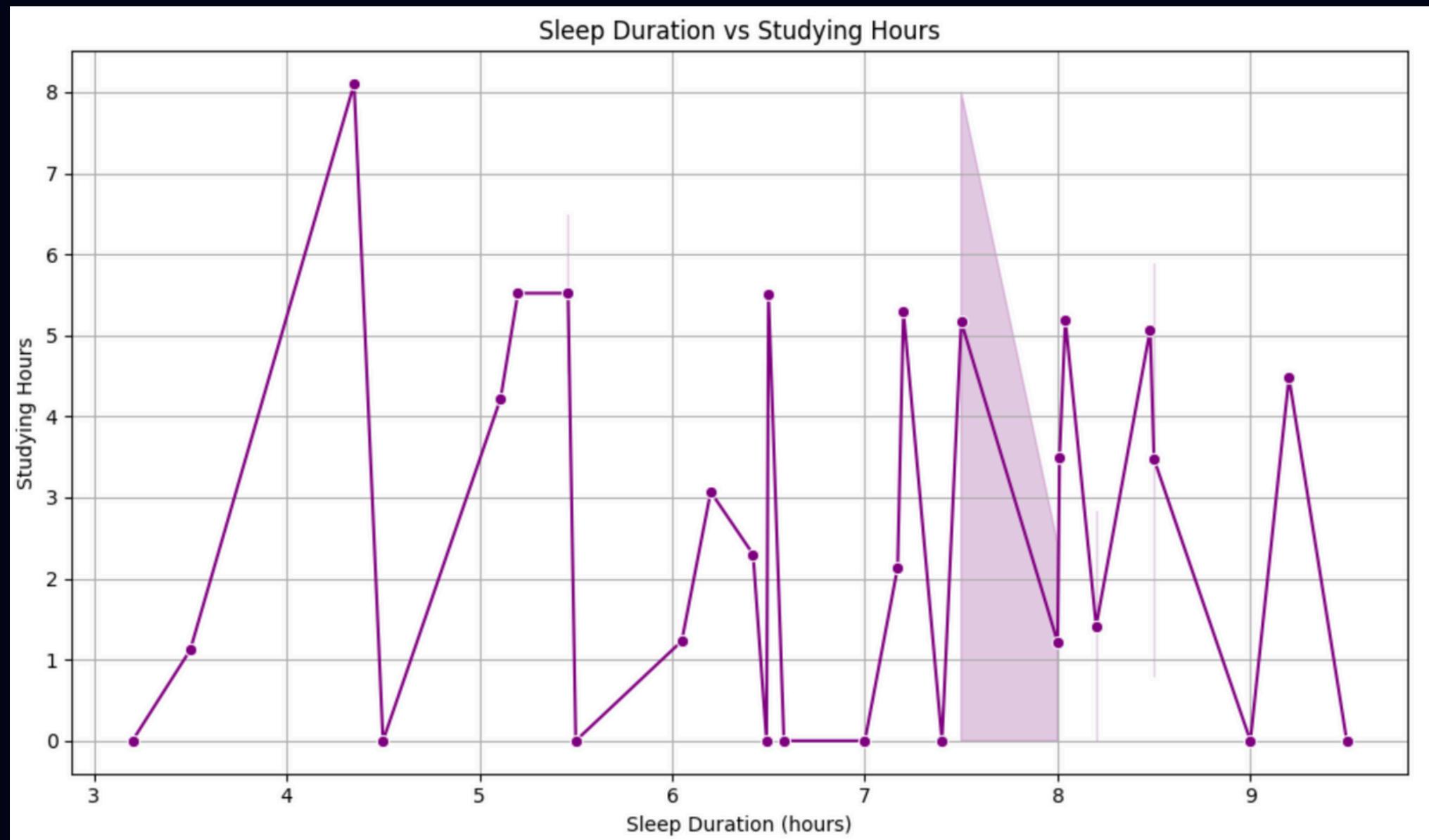
These patterns visually support the hypothesis of a negative relationship.



# Bivariate Analysis

## Sleep Duration vs Studying Hours

Although no strong linear trend is observed, moderate sleep durations (around 6–7 hours) seem to align with higher studying hours, suggesting a potential sweet spot for academic productivity.

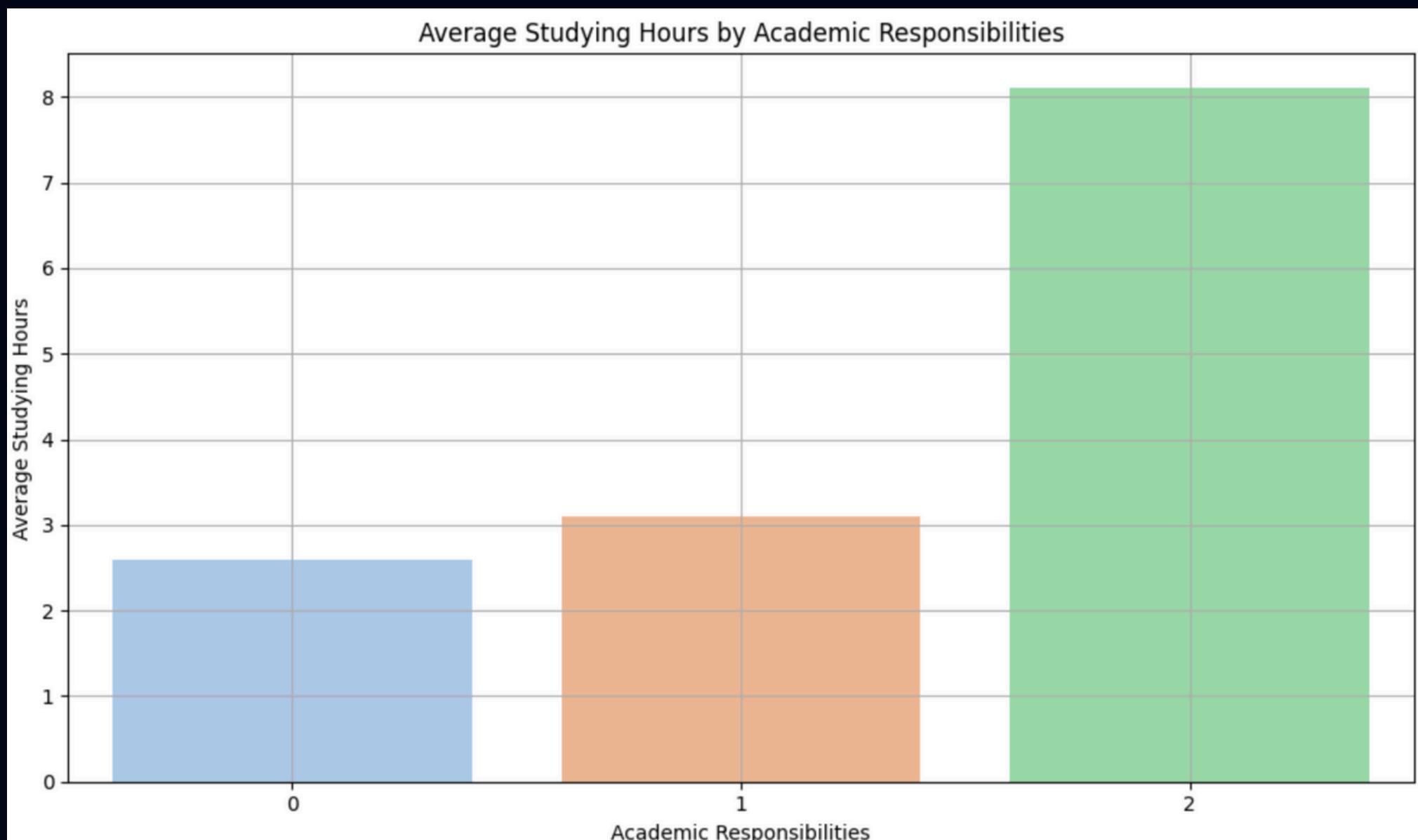


# Bivariate Analysis

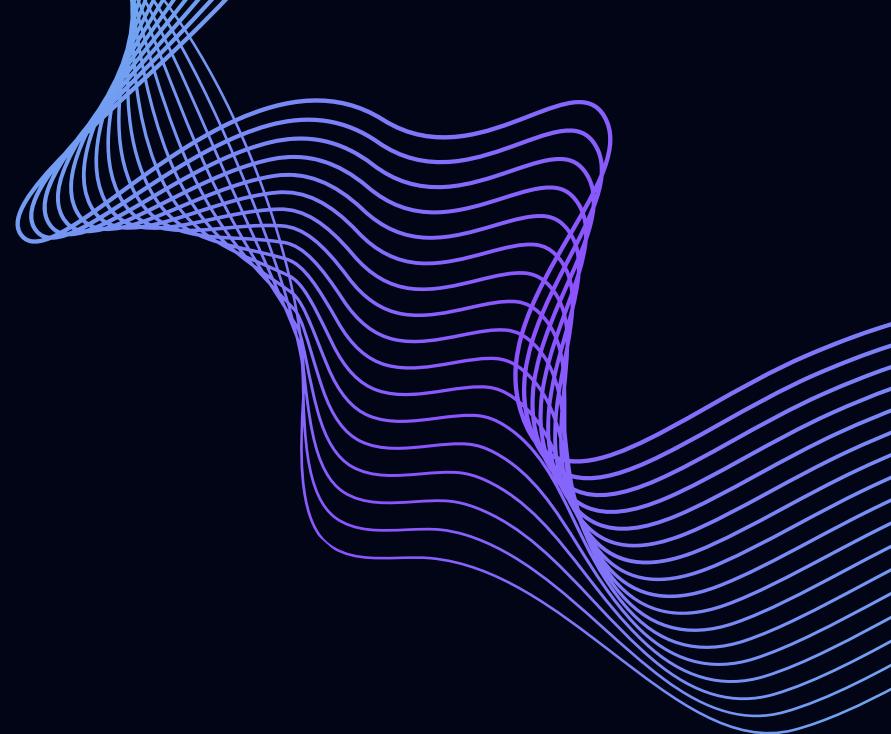


- Barplot: Academic Responsibilities vs Studying Hours

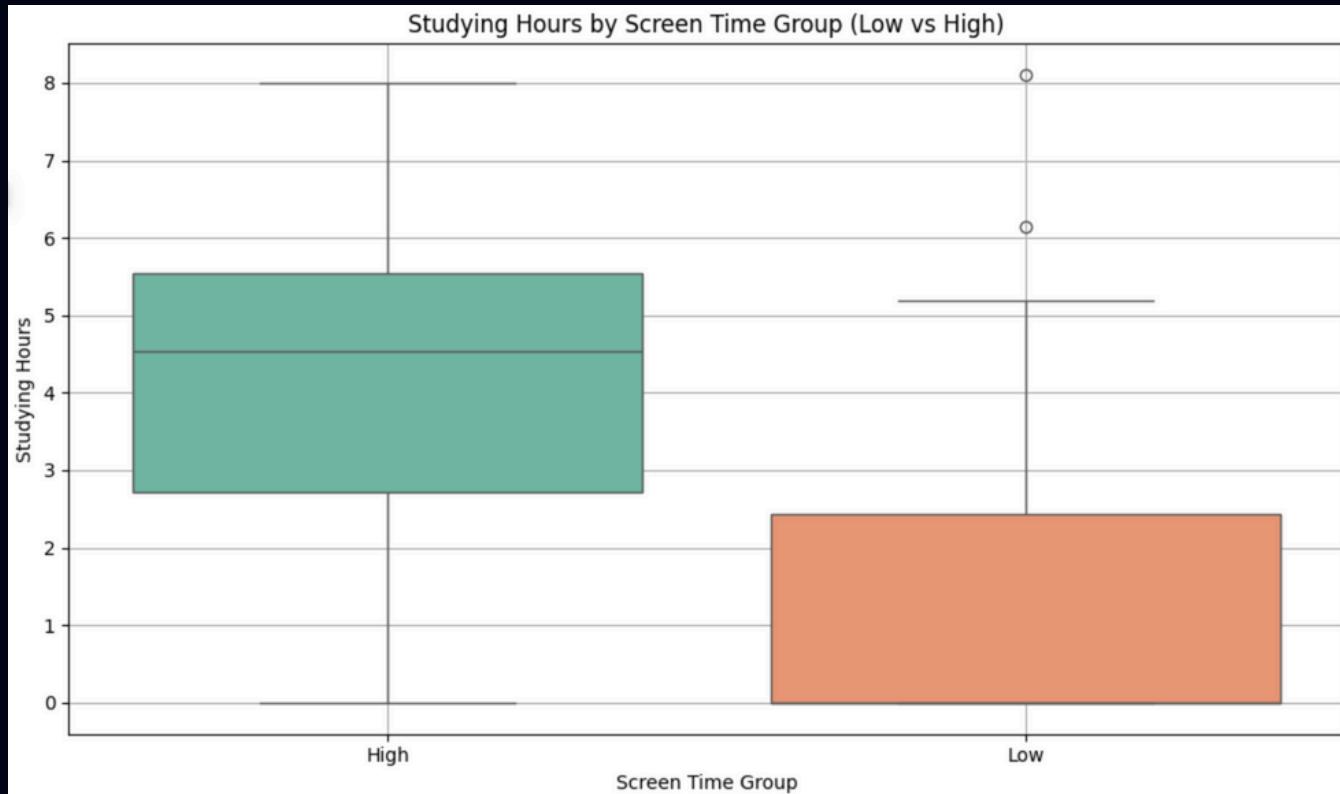
Higher academic responsibilities tend to study more, indicating a positive association between workload and studying hours.



# Hypothesis Testing

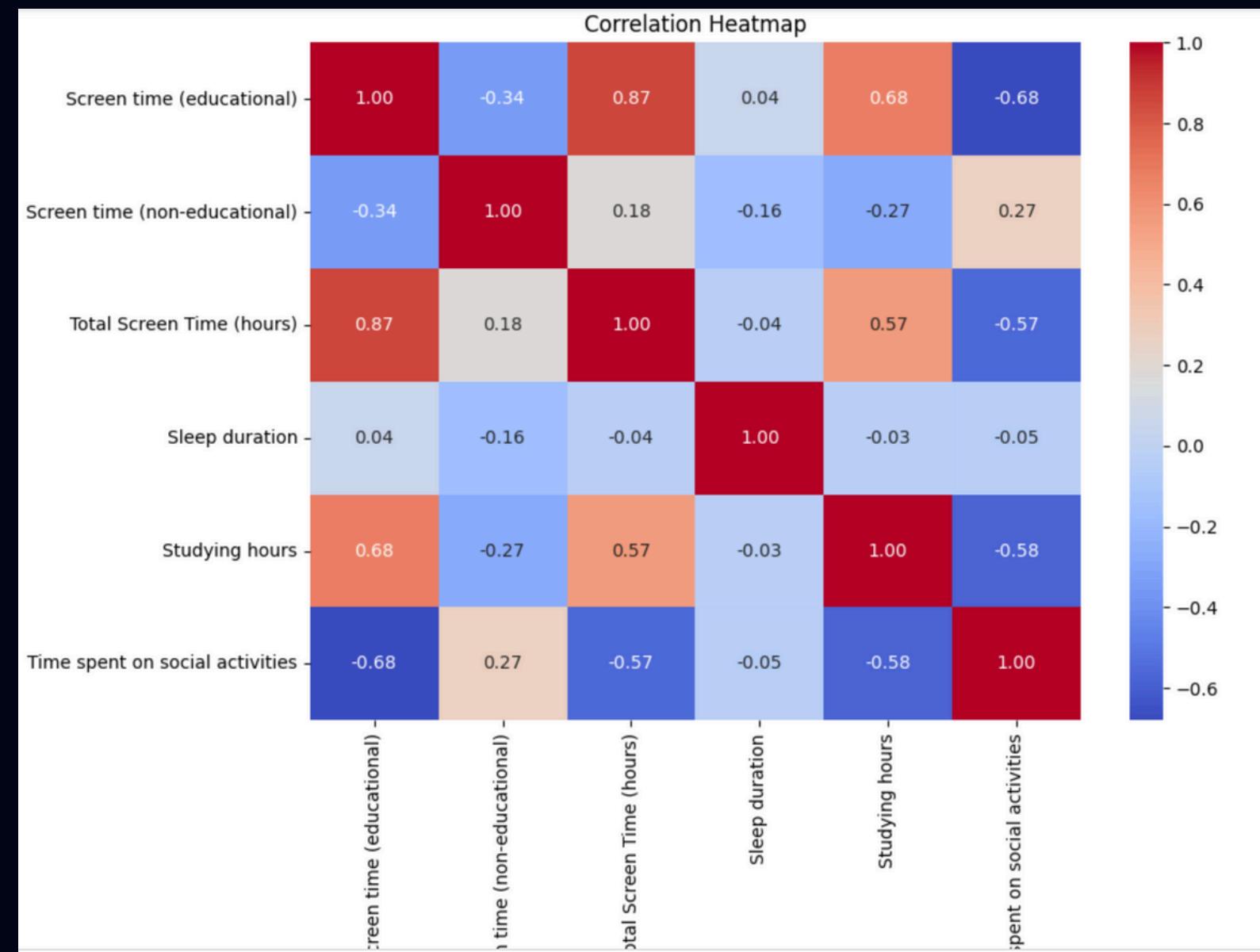


- T-Test result:  
 $t\text{-statistic} = -3.492$ ,  
 $p = 0.0012 < 0.05 \rightarrow$  Reject null hypothesis.
- Pearson Correlation:  $r = 0.566$ ,  $p = 0.0001 < 0.05$ .
- Conclusion: Statistically significant negative correlation between screen time and studying hours



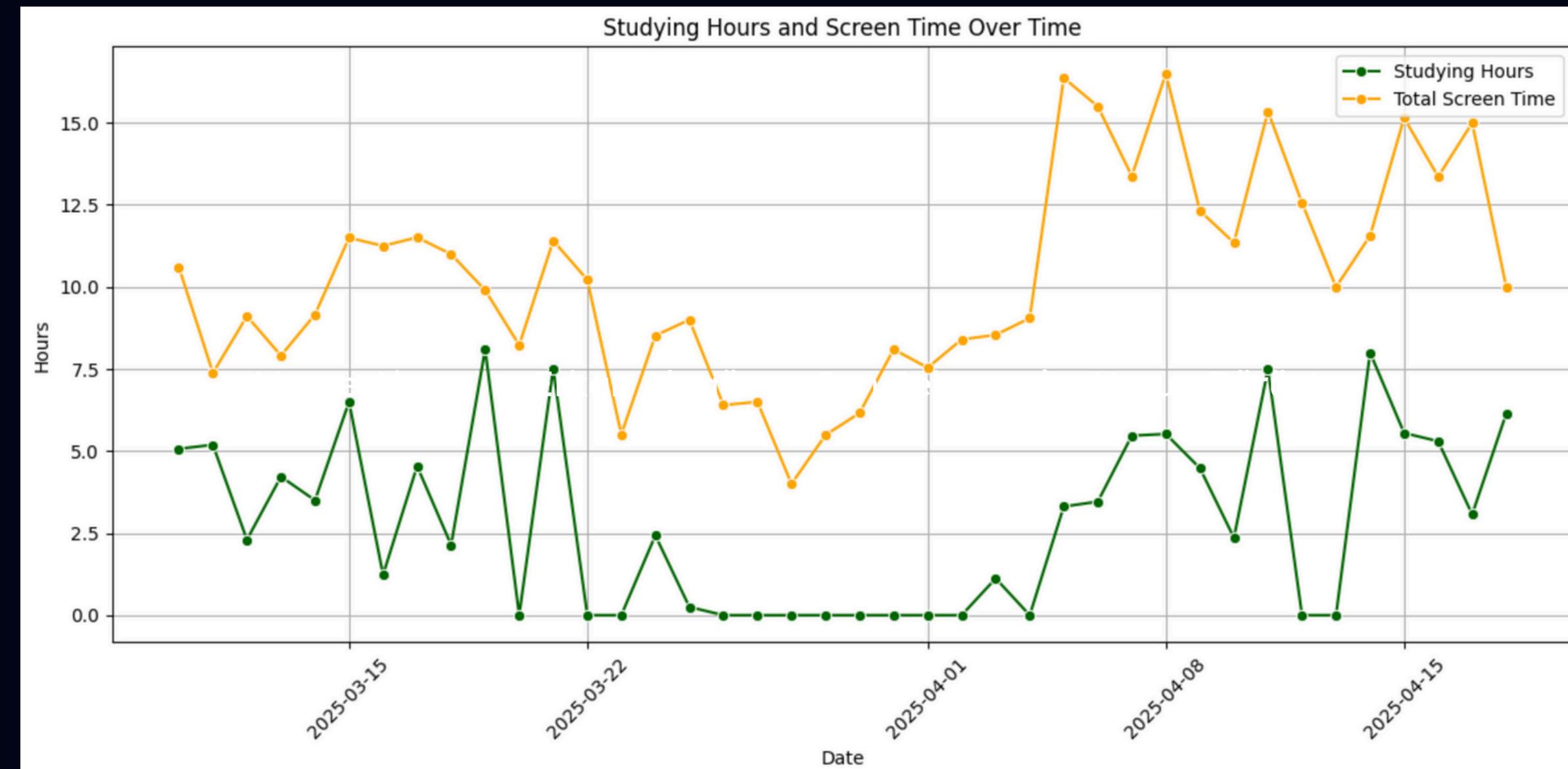
# Multivariate Analysis

- Heatmap: Correlation Matrix
  - Studying hours show a moderate negative correlation with both total screen time ( $r = -0.57$ ) and non-educational screen time ( $r = -0.60$ ).
  - They have a weak to moderate positive correlation with educational screen time ( $r = 0.27$ ) and sleep duration ( $r = 0.35$ ).

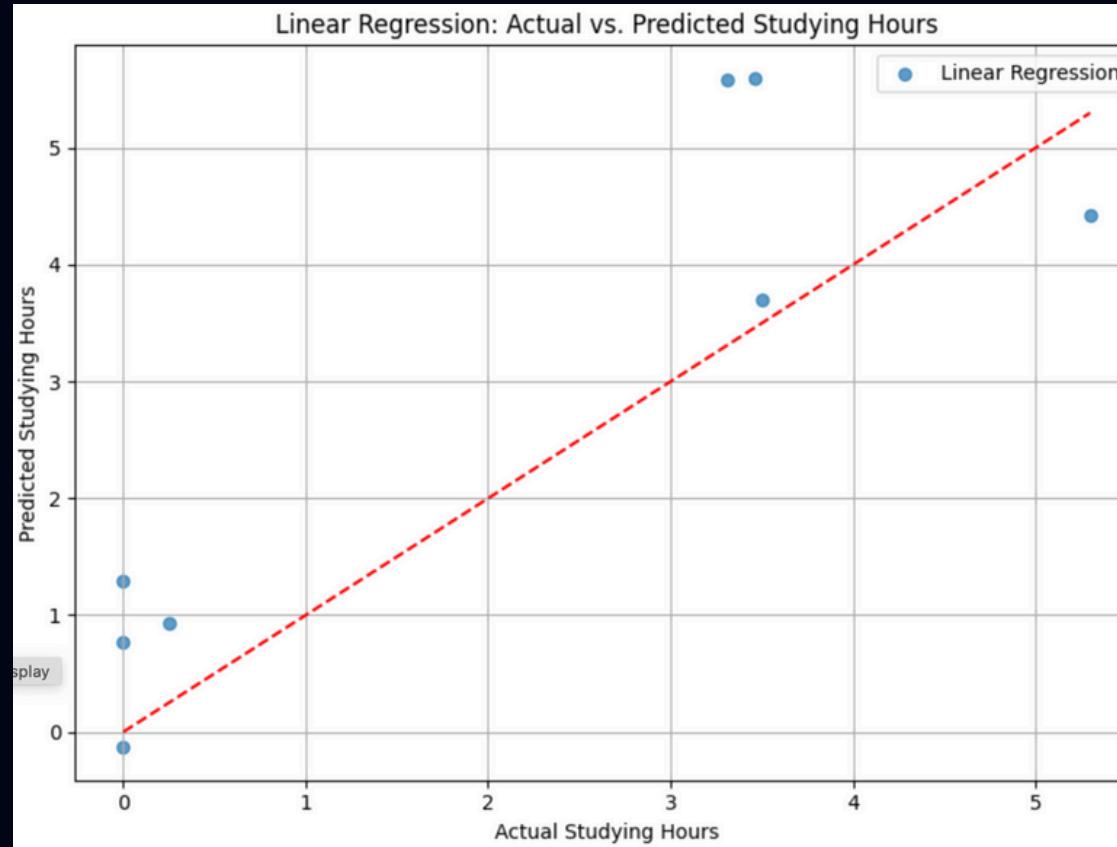


# Multivariate Analysis

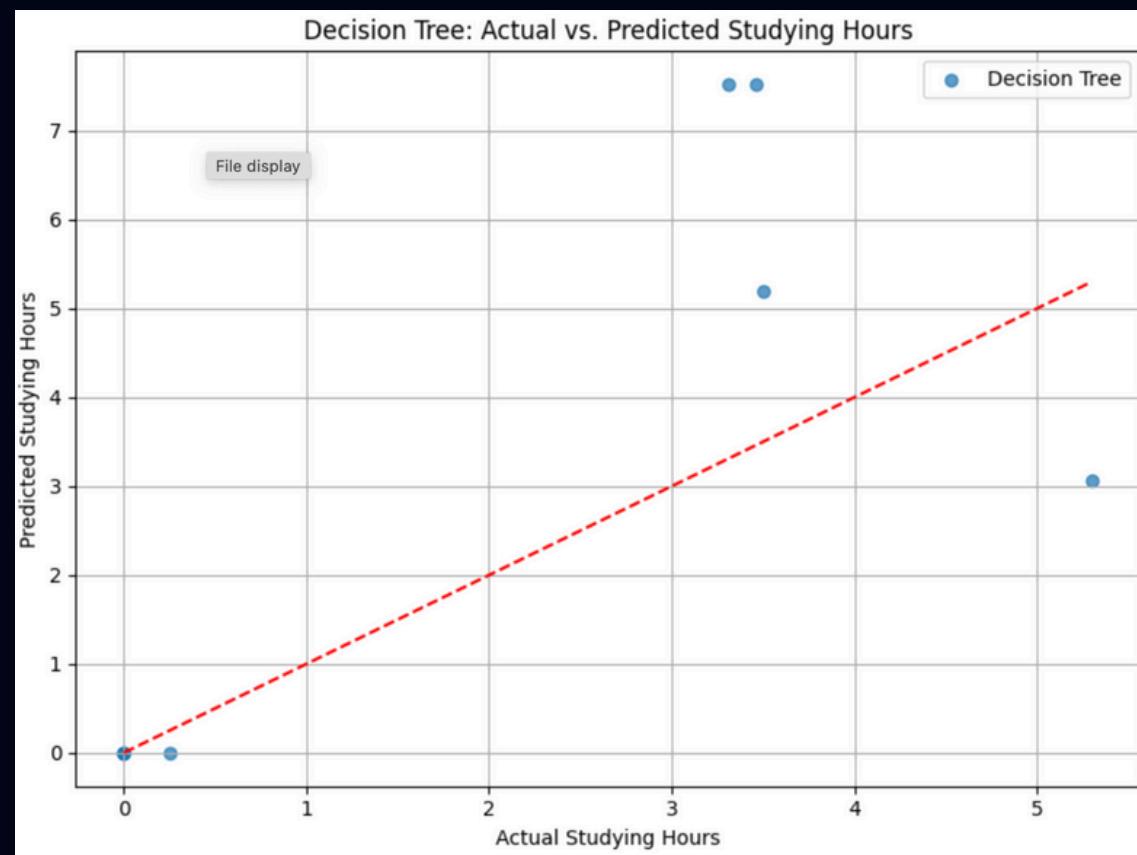
Studying hours tend to drop on days when total screen time increases, indicating an inverse relationship over time



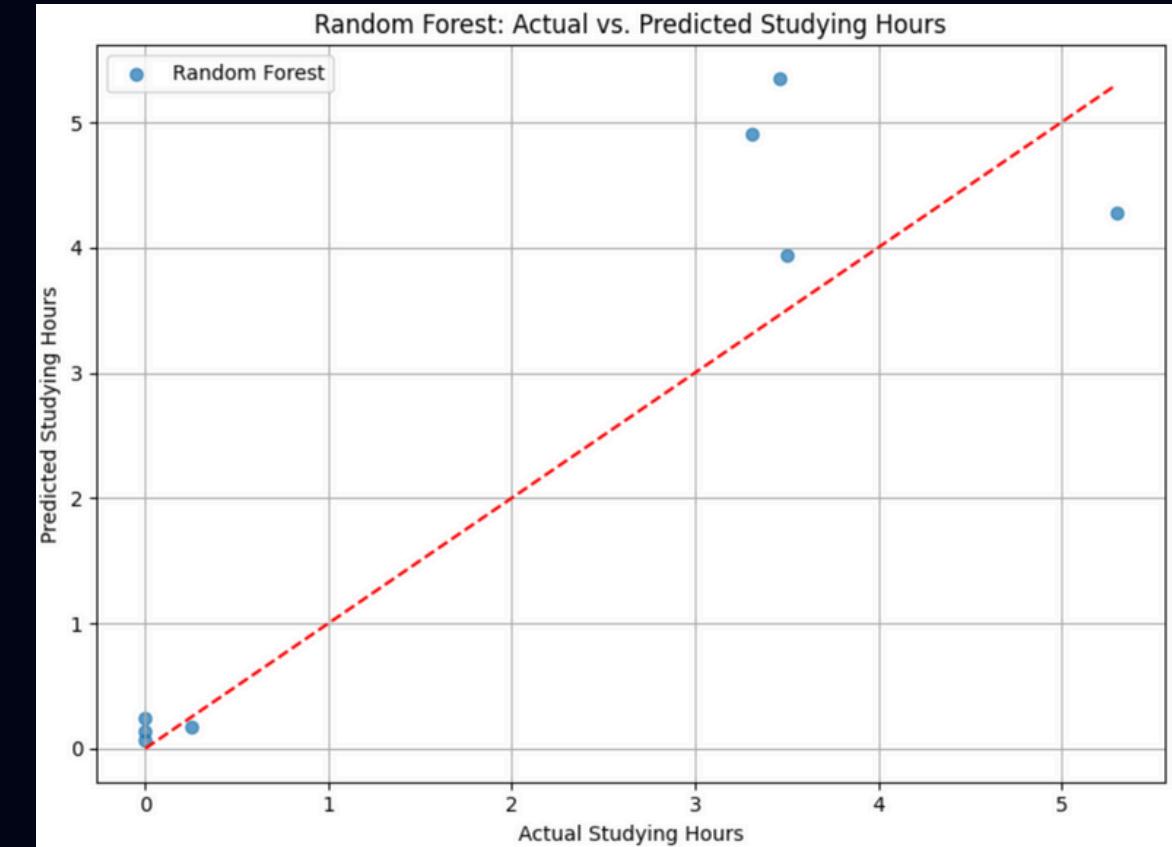
# Regression Analysis



Decision Tree Results:  
- Mean Squared Error: 5.26  
-  $R^2$  Score: -0.31



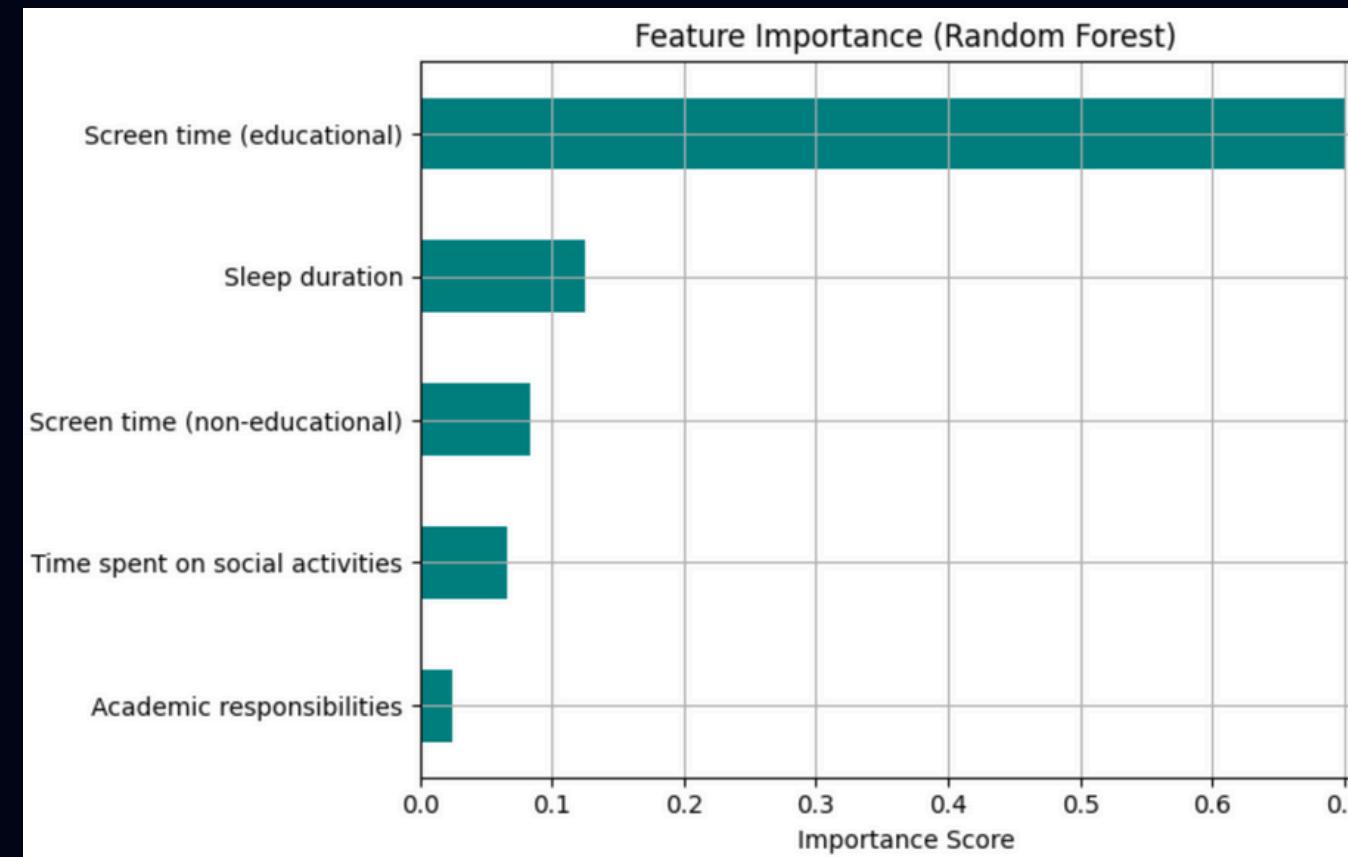
Linear Regression Results:  
- Mean Squared Error: 1.66  
-  $R^2$  Score: 0.59



Random Forest Results:  
- Mean Squared Error: 0.93  
-  $R^2$  Score: 0.77

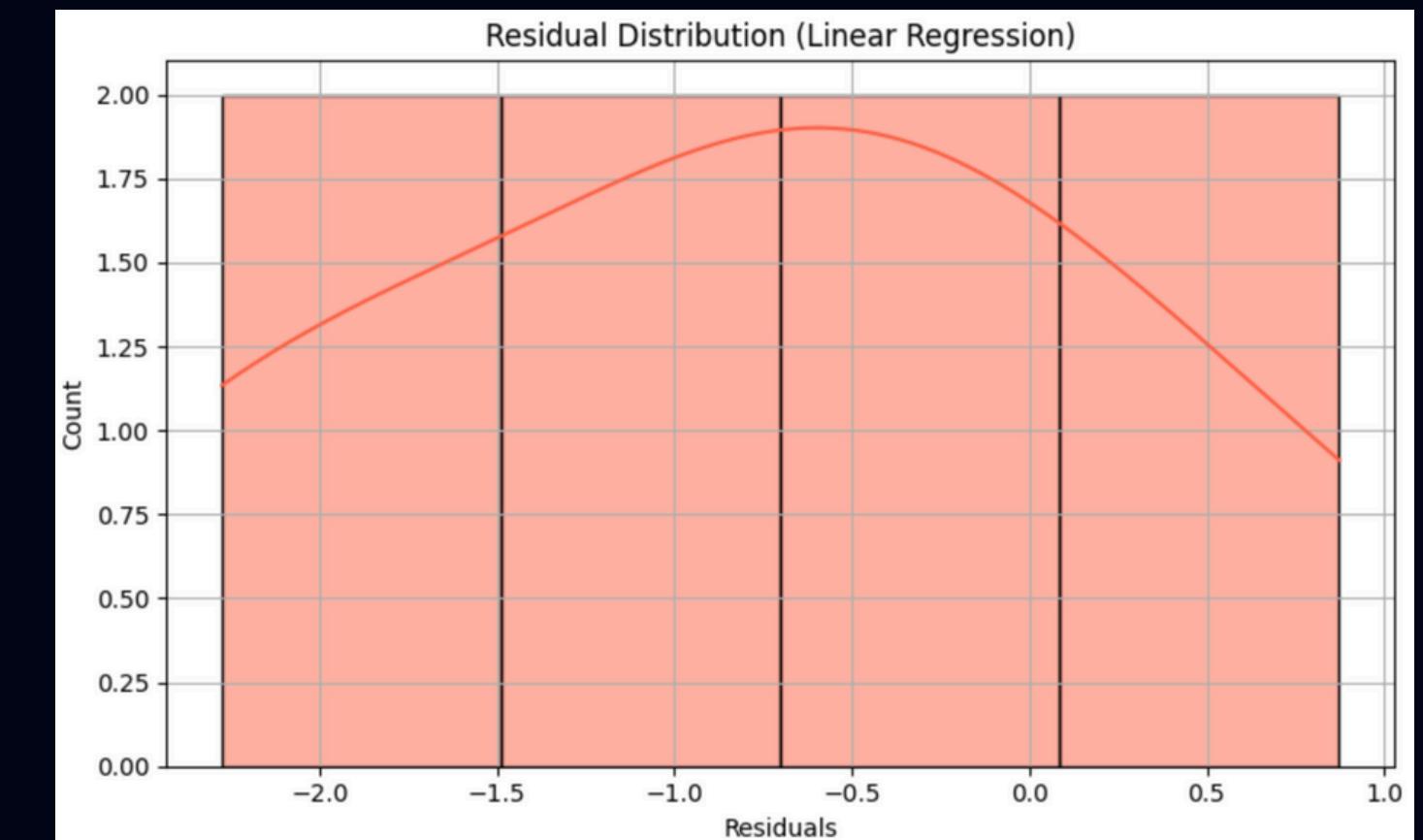
Best Performing Model: Random Forest with  $R^2 = 0.77$

# Feature Importance & Error Analysis



The Random Forest model reveals that educational screen time is by far the most influential feature when predicting studying hours.

The residual plot for Linear Regression shows a near-normal error distribution. This indicates that the model's predictions are fairly unbiased, and that Linear Regression is a suitable baseline for understanding general patterns in the data.



# Conclusion

- The null hypothesis is rejected.
- Increased total screen time is significantly associated with decreased studying hours.
  - Effect strongest with non-educational screen time.
- Conclusion: Balance in screen habits is critical for academic productivity.