

# How Lifestyle Factors Impact Productivity: A Study on Time Management

## Data-driven Insights for Business Decision Making

**Course:** MIS 311 - Introduction to Business Analytics

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**Group:** RAINBOW



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According to WHO (2021),  
**working >55 hours/week**  
increases the risk of  
**stroke by 35% and**  
**heart disease by 17%.**

(WHO, 2021)

# 1.Specify the Question

## 1.1. Main Business Question



How do different **lifestyle factors** - including work hours, sleep, leisure time, and screen time- **impact productivity?**

## 1.2. Research Objectives

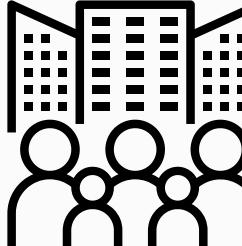
- Identify the **key factors** that influence productivity.
- Analyze the **relationship** between work hours, sleep, leisure, and productivity.
- Provide **data-based recommendations** for optimizing efficiency without compromising health.



## 1.3. Research Importance



**Improve focus, efficiency, and overall well-being.**



**Lead to increased productivity, reduced employee burnout, and better overall performance.**



**Foster a sustainable work culture can contribute to a healthier and more engaged workforce.**



## 2.1 Data Origin

**Purpose:** Analyze participants' daily routines and their impact on productivity and relaxation.



### Data Collection:

- Surveys: **Self-reported** daily activities (work, leisure, exercise, sleep, commute).
- Digital Tools: Metrics like screen time and commute duration.

### Key Variables:

- **Daily Work Hours:** Hours spent on work-related activities.
- **Daily Leisure Hours:** Time for non-work, non-exercise leisure activities.
- **Daily Exercise Minutes:** Physical activity in minutes.
- **Daily Sleep Hours:** Total sleep per day.
- **Screen Time (hours):** Time on devices like smartphones or computers.
- **Commute Time (hours):** Daily commuting hours.
- **Productivity Score:** Self-reported (0–100) perceived productivity.



## 2.2 Data Cleaning

### ✓ Integrity Checks

No missing values detected.

Logical constraints verified:

- Daily Work Hours:  $\leq 24$  hours.
- Daily Exercise Minutes: 0–600 minutes.

All values met logical limits.

### ✓ Duplicate Removal

No duplicate rows; dataset confirmed unique and accurate.

### ✓ Outlier Detection

Variables Assessed:

- Daily Work Hours:  $\leq 16$  hours/day.
- Screen Time:  $\leq 16$  hours/day.
- Commute Time:  $\leq 10$  hours/day.

=> Result: No outliers detected; dataset intact and representative.





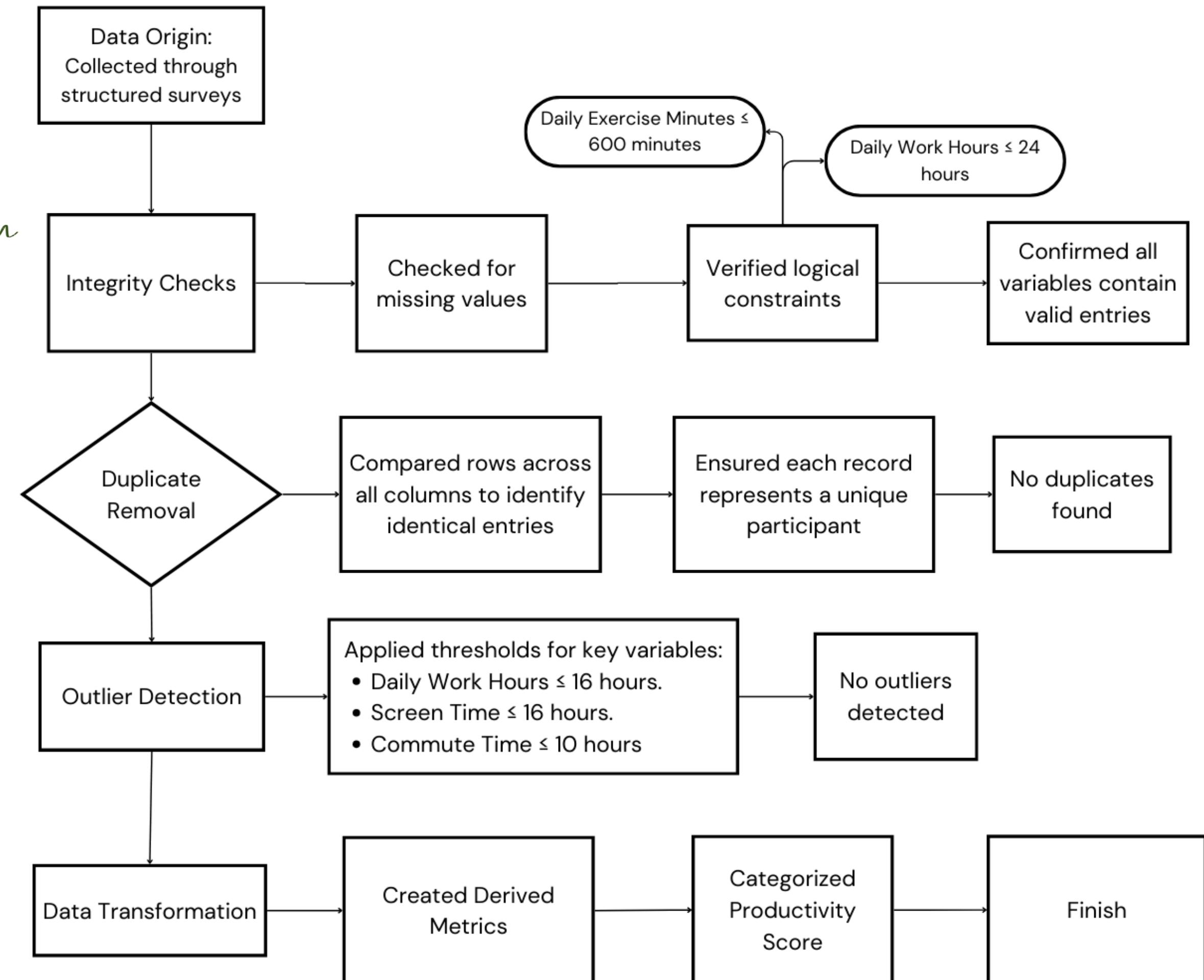
## 2.3 Data Transformation

### Numeric Conversion and Categorization

- Productivity Score Categorization:
  - Low Productivity: 0–50.
  - Medium Productivity: 51–75.
  - High Productivity: 76–100.

*Difficult to  
 tell the direction  
 of the chart*

## 2.4 Flow Chart



# DATA TO INSIGHTS

Work hours

Exercise & Sleep

Screen time

Productivity Scores

- ✓ The Analytical Methods & Techniques
- ✓ Excel's Data Analysis ToolPak
- ✓ Data Visualization of the Results



# Descriptive Statistics

Understanding key variables such as **screen time**, **daily work hours**, **exercise routines**, and **sleep patterns** provides valuable insights into how these factors may **impact productivity**.

## Daily Exercise Minutes

Mean = 64.6 minutes, with a large range (6 to 120 minutes). Variability here may influence energy levels and focus.

## Daily Sleep Hours

Mean = 7.11 hours, Median = 7.1 hours, and Mode = 6.9 Consistent values, suggesting consistent sleep patterns.

## Screen Time (hours)

Mean = 5.77 hours, with a range from 2.8 to 7.8 hours. Notable variation indicates different digital consumption patterns.

## Productivity Score

Mean = 82.18, Median = 85, Maximum is 95 & minimum 55. Some lower scores may have slightly dragged the average down.

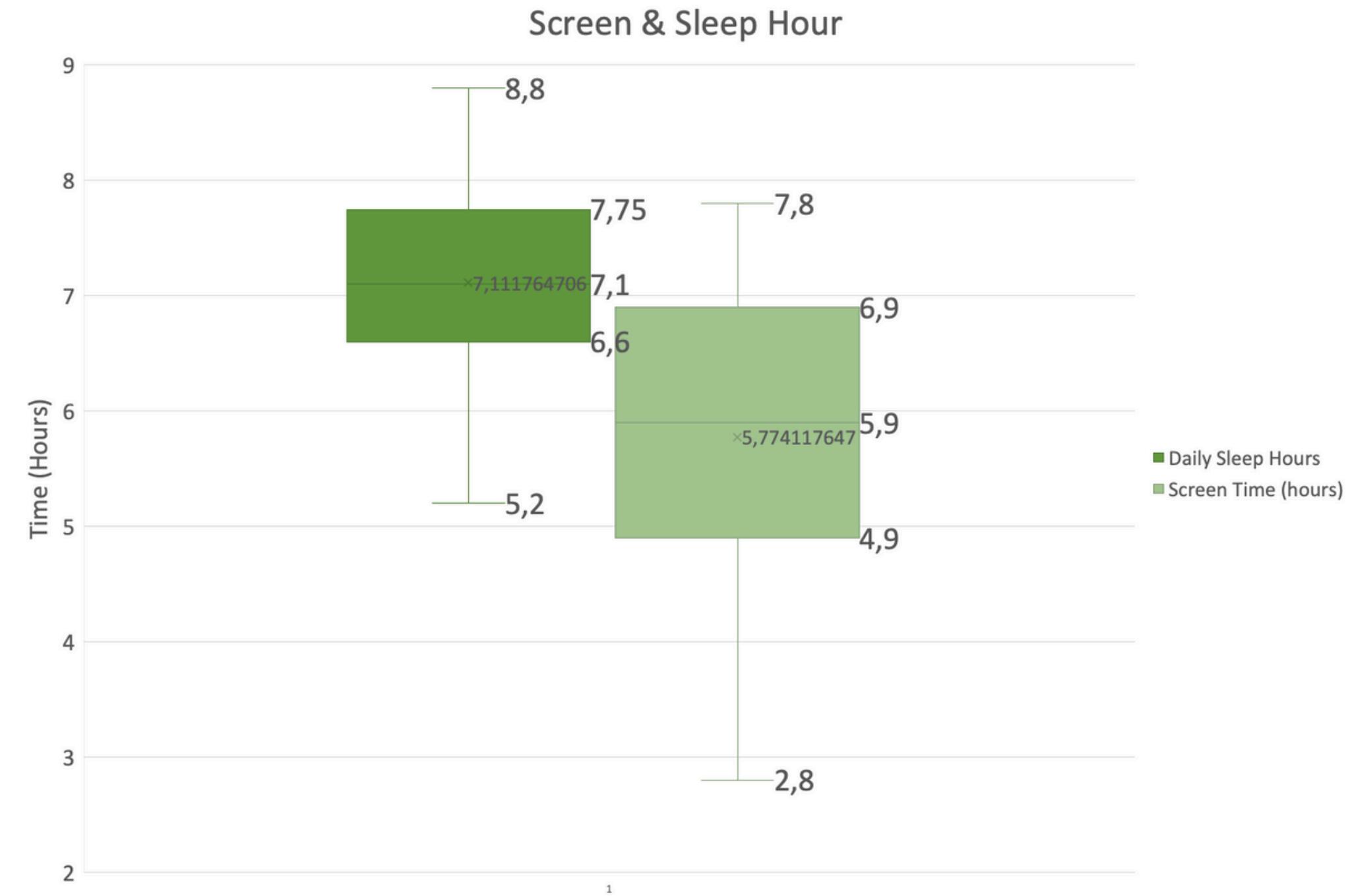
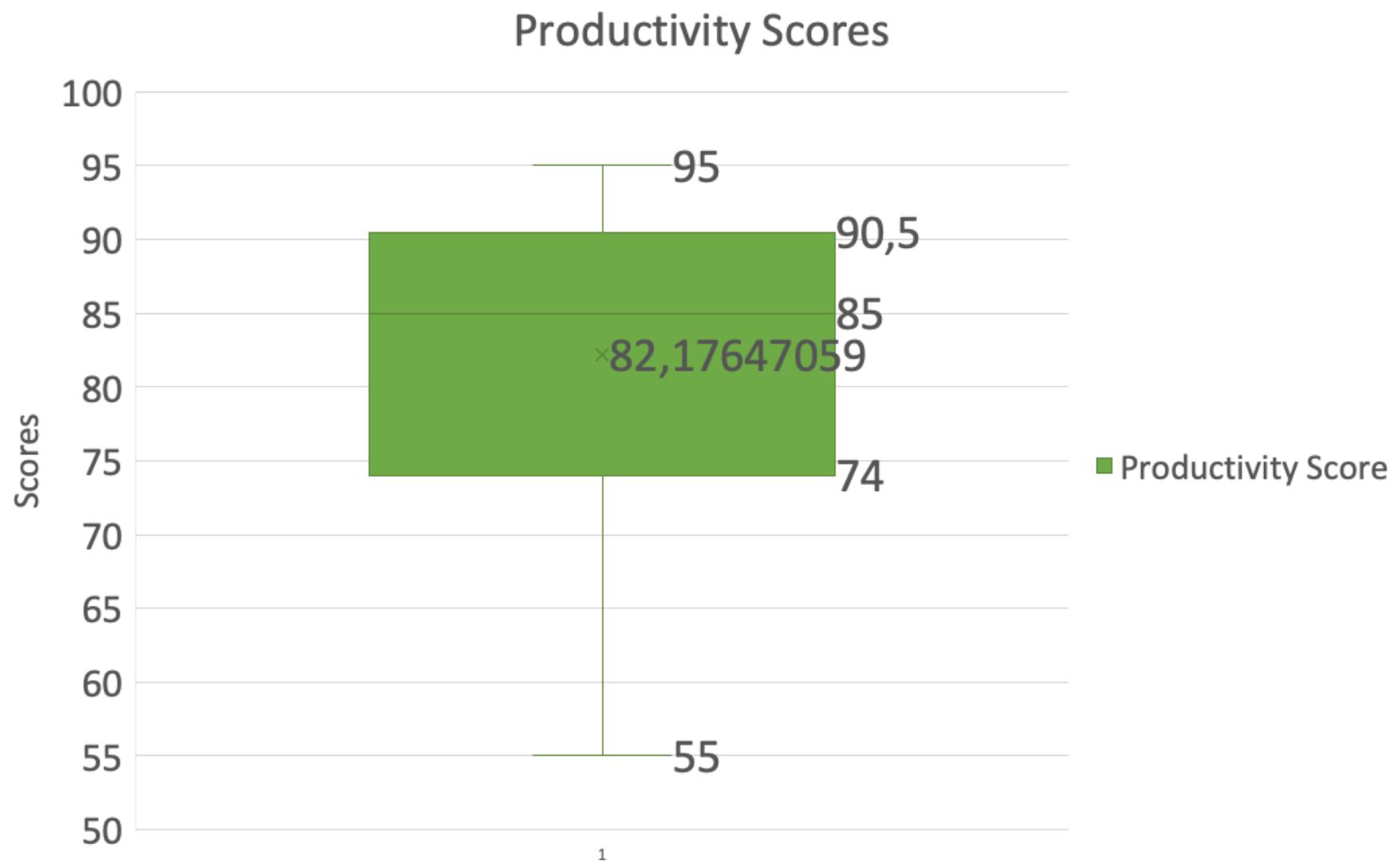
## Age Distribution

Mean age is 39.52, with a range from 18 to 63. This suggests a diverse age range, which may influence lifestyle patterns.

## Daily Work Hours:

Mean = 7.02 hours, Median = 7.1 hours. Minimum is 3.4 & Maximum is 9.5. Suggests relatively stable working patterns across individuals.

# Box and Whisker Plot (Boxplot)

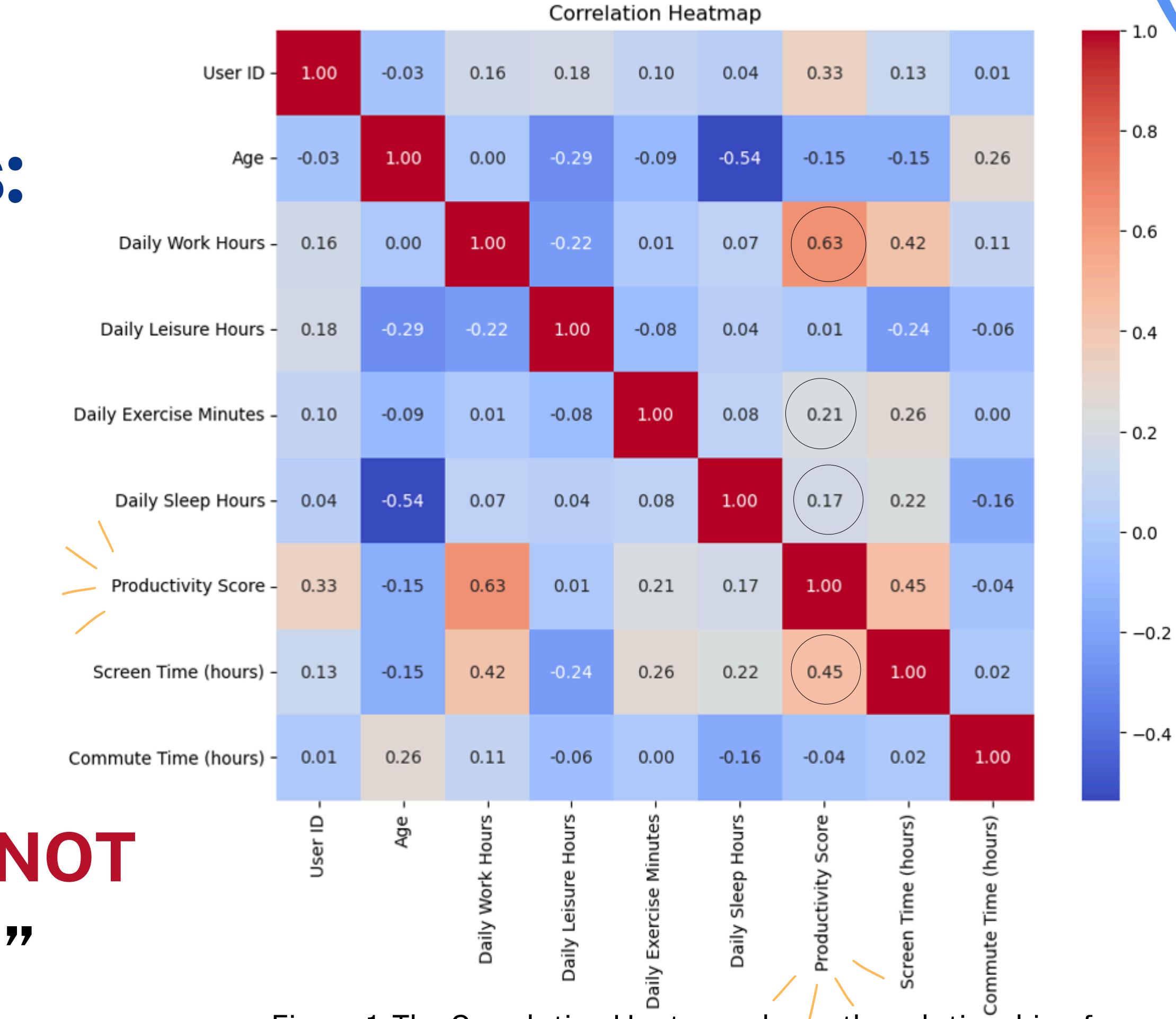


\*\*Lower Whisker is markedly longer than Higher Whisker

\*\*left skewed distribution (mean<median)

# Correlation Analysis:

- Daily Work Hours shows the **strongest positive correlation (0.63)** with productivity
- Exercise (0.21) and Sleep (0.17) exhibit **moderate positive correlations**
- Screen Time (0.45) shows a **mild positive correlation**



“Correlation **DOES NOT**  
imply Causation”

Figure 1: The Correlation Heatmap shows the relationship of variables (created by Python)

# Regression Analysis for Productivity

The strength and character of the relationship between a dependent variable and one or more independent variables.

## Hypothesis testing:

→ Null Hypothesis ( $H_0$ ): NO effect

→ Alternative Hypothesis ( $H_1$ ): Effect

**R Square = 0.5153**

The model explains **51.53%** of the variation in productivity scores.

**Significance F = 4.8412E-10 (< 0.05)**

The model is statistically significant, rejecting the null hypothesis.

**Intercept = 31.97**

Baseline productivity score when all variables are zero.

Variable	Coefficients	P-Value (0.05)	Interpretation
Daily Work Hours	<b>4,066</b>	2.42E-09	<b>Highly Significant</b>
Daily Exercise Minutes	0,063	0.0488	<b>Significant</b>
Daily Sleep Hours	0,582	0.6436	Not Significant
Screen Time (hours)	<b>1,566</b>	0.0525	<b>Marginally Significant</b>

\*\*barely bridges the level of significance 0.05, so the 'team analysis' decides to keep analysing the impact of Screen Hours on Productivity Score (increase 1,57 scores each rise hour)

# Data Visualization

## Insights:

Daily Work Hours is the most significant factor affecting productivity, with an average increase of 4.07 points (Coefficients from Regression) for each additional hour worked.

Suggesting that those who work longer tend to achieve higher productivity.

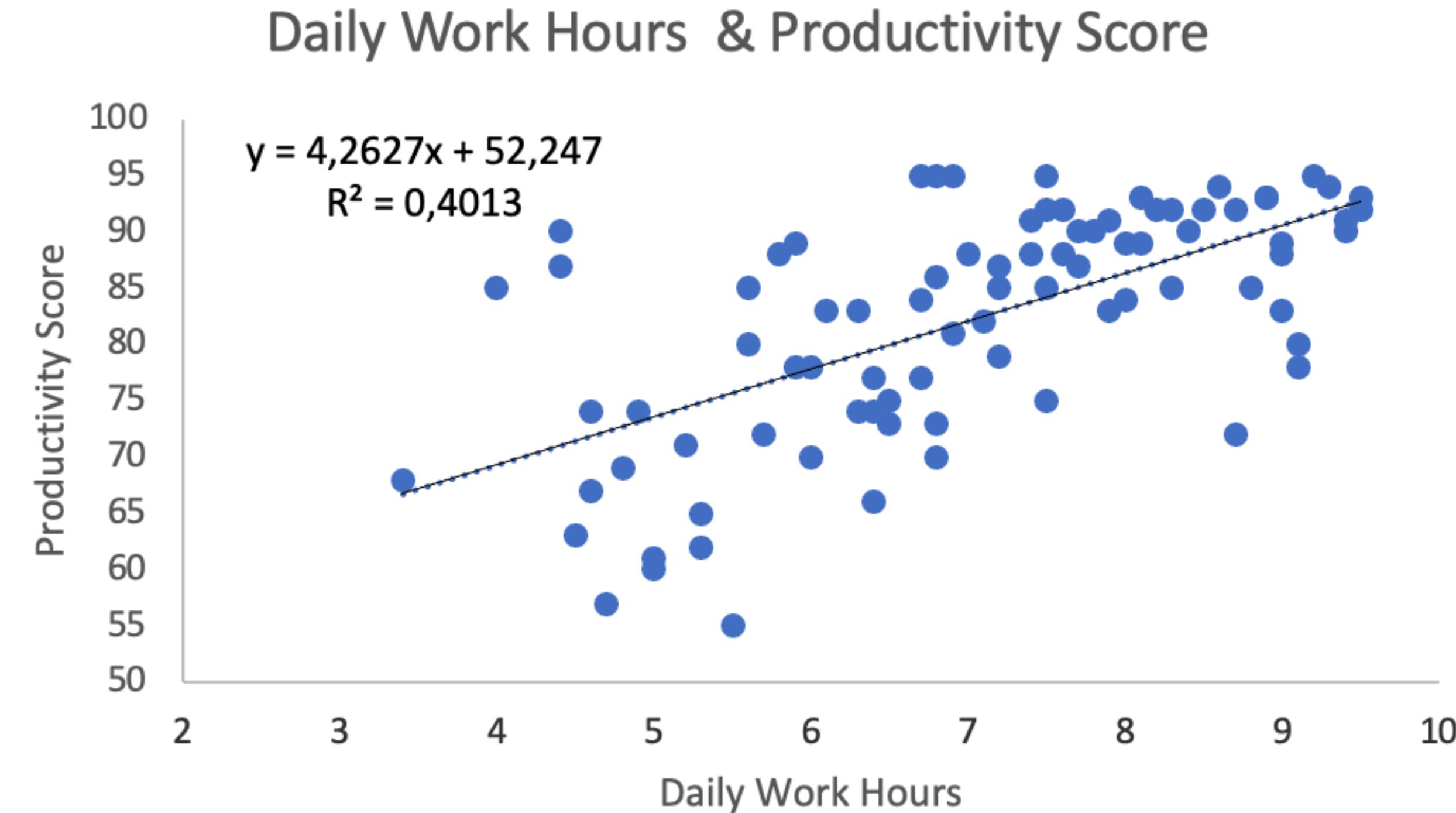


Figure 1: The positive relationship between Daily Work Hours and Productivity Score

# Data Visualization

## Insights:

Screen time has a **weak** yet noticeable **positive impact on productivity**.

While the **relationship isn't statistically strong**, the trend suggests that **moderate screen use may support improved productivity**.

Encouraging **balanced screen time — focused on productive activities — could be a practical strategy for enhancing performance**.

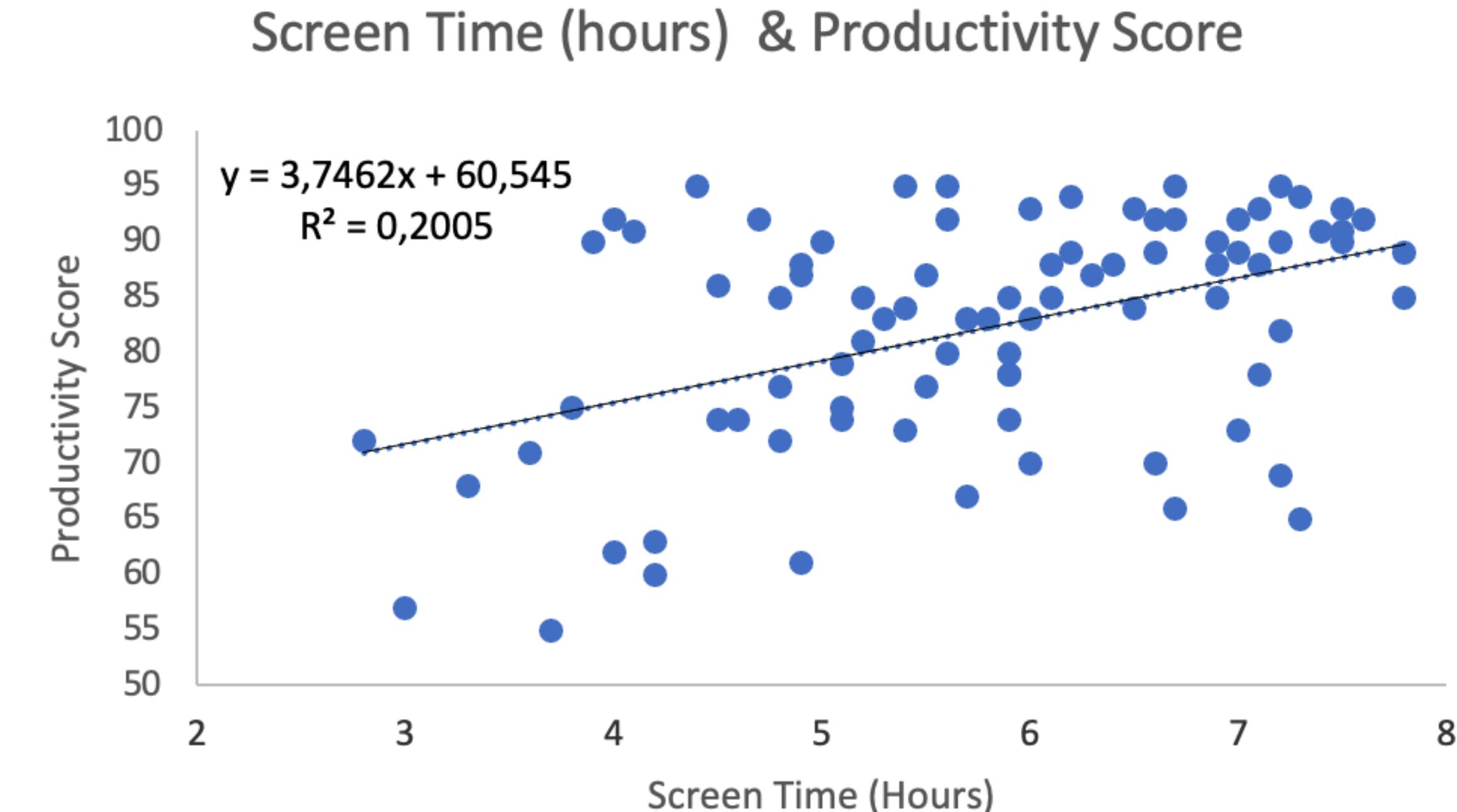
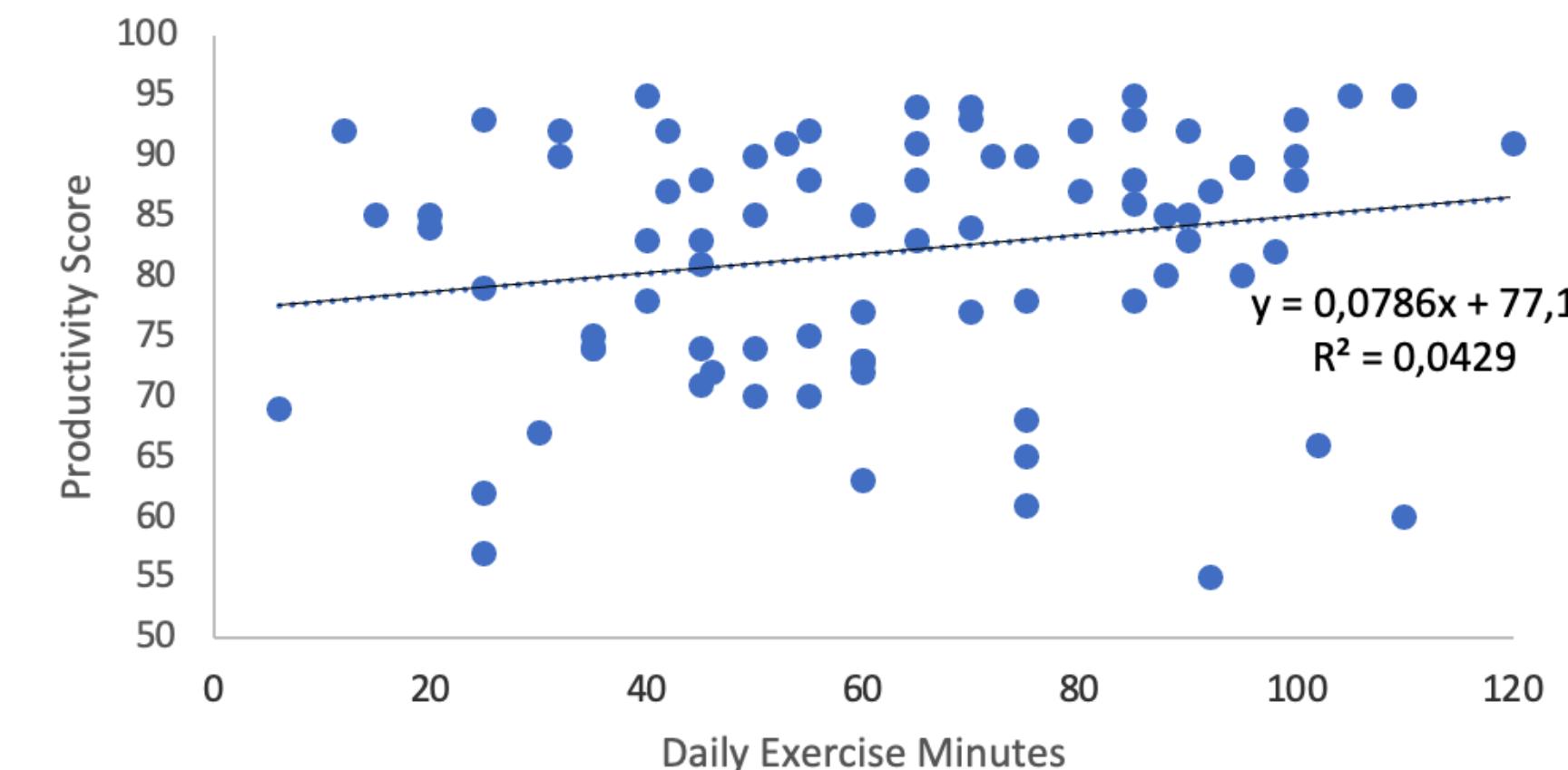


Figure 2: The scatter plot shows a weak positive trend between Screen Time (hours) and Productivity Score

# Lifestyle factors:

Exercise has a clear, positive, and statistically **significant impact** on productivity ( $P 0.0488 < 0.05$ ), though the effect size is modest - the relationship is statistically significant, the actual impact seems small because of the low  $R^2$  value.

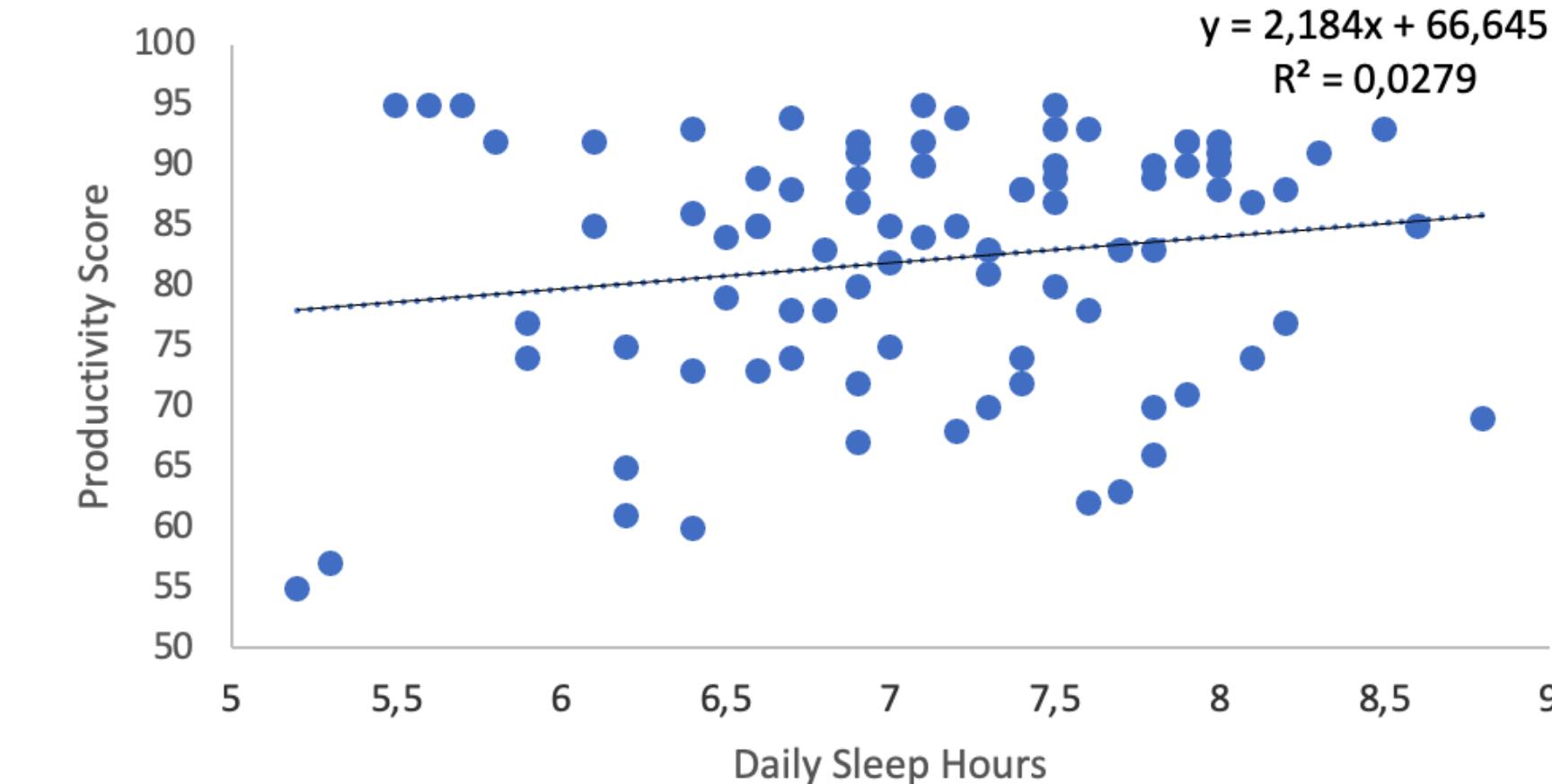
Daily Exercise Minutes & Productivity Score



Sleep duration does **NOT significantly impact productivity** ( $P 0.6436 > 0.05$ ). Increasing sleep hours alone does not lead to meaningful improvement in productivity based on this dataset.



Daily Sleep Hours & Productivity Score



# Because...!

- The trend line is based purely on **mathematical** to minimize the total distance to all data points.
- The **trendline** increases slightly due to the sample data trend.
- However, this slight upward trend is **not statistically significant** ( $p\text{-value} = 0.6436$ ), meaning this observed increase could simply be due to random variation or chance.



# Data-Driven Insights and Strategic Recommendations



- **Work Hours:** Strongest influence on productivity (Correlation: 0.63). Each additional hour increases productivity by 4.07 points.
- **Burnout Risk:** No explicit burnout metrics, but excessive hours may lead to long-term decline, especially in high-pressure sectors.
- The reduction in activity and work productivity is brought on by poor sleep quality (Matsuzaki et al., 2017).
- While exercise improves focus, a finding that echoes Van Dantzig et al. (2012) warnings about the consequences of sedentary behavior.

# Data-Driven Insights and Strategic Recommendations

## Lifestyle Factors:

- Exercise, Sleep and Leisure: Moderate yet meaningful correlation with productivity.
- Screen Time: Mild positive correlation; beneficial for digital workflows but linked to mental fatigue.





# Data-Driven Insights and Strategic Recommendations

## Addressing the Research Questions

- Key Determinants of Productivity:
  - Primary driver: Work hours.
  - Foundational enablers: Healthy lifestyle habits (exercise, sleep, leisure).
- Balance Between Work, Leisure and Health:
  - Excessive work hours risk burnout.
  - Exercise & sleep enhance mental performance.

# Strategic Recommendations

Category	Recommendation	Action Steps
<b>Optimize Work Hours</b>	Implement structured schedules	Introduce focused work blocks (4–6 hours of deep work) with scheduled breaks.
	Offer remote work options	Define clear remote work policies or work-from-home.
<b>Promote Healthier Lifestyles</b>	Launch wellness programs	Subsidize gym memberships; host mindfulness sessions and sleep hygiene workshops.
	Organize team-building activities	Host in-person or virtual social events (game nights, group hikes or travels).
<b>Data-Driven Monitoring</b>	Track productivity trends	Correlate work hours, screen time, and wellness metrics with output.
	Monitor workloads	Use productivity tools to identify employees at risk of burnout.

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# Thank You!