Project Proposal

Analyzing the Impact of Morning Routines on Productivity and Mood Using Machine Learning

Team Members

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Introduction

Daily routines have a significant impact on human well-being, productivity, and mental health. Elements such as sleep duration, meditation, exercise, breakfast habits, and journaling have been linked to outcomes like mood and daily performance. This project aims to analyze a dataset of morning routines to uncover patterns and predictive relationships. By leveraging machine learning techniques, the project will explore how lifestyle choices in the morning can influence productivity scores and mood throughout the day.

Objectives

1. Identify relationships between morning habits (sleep, exercise, meditation, breakfast, journaling) and daily productivity.
2. Classify mood outcomes (Happy, Neutral, Sad) based on morning activities.
3. Discover clusters of morning routine patterns and compare their impact on outcomes.
4. Provide actionable insights into how small behavioral changes in the morning can lead to better day-long performance.

Problem Statement

Students and professionals often struggle to maintain consistent productivity and positive moods due to irregular routines. There is a lack of data-driven analysis on how different combinations of morning habits affect daily outcomes. This project seeks to fill that gap by applying machine learning to morning routine data, enabling predictive and prescriptive insights for individuals to optimize their lifestyle.

Scope of the Project

- Focus on lifestyle analytics using an individual's morning routine dataset.
- Applicable to students, working professionals, and wellness programs.
- Extendable to smart health apps that provide personalized recommendations.

Methodology

Data Collection & Preprocessing:

- Use the provided morning routine dataset
- Handle missing values, encode categorical data (e.g., breakfast type, journaling), normalize numerical variables (sleep, exercise, meditation).

- Engineer new features such as sleep-to-wake difference, activity intensity, etc.

Model Development:

- **Model 1: Regression (e.g., Linear Regression, Random Forest Regressor)** – Predict the numerical Productivity Score.
- **Model 2: Classification (e.g., Decision Tree, Logistic Regression, SVM)** – Classify Mood into categories (Happy, Neutral, Sad).
- **Model 3: Clustering (K-Means)** – Group days into distinct *routine clusters* and analyze their outcomes.

Evaluation:

- Use RMSE/MAE for regression models.
- Use accuracy, F1-score, and confusion matrix for classification.
- Use silhouette score and visualization for clustering.

Visualization:

- Scatter plots for sleep vs. productivity.
- Confusion matrix for mood classification.
- Cluster plots showing routine types.

Expected Outcomes

- A predictive model linking morning habits to productivity scores.
- A classifier that can reasonably predict mood categories from morning behavior.
- Identification of clusters of "healthy" vs. "unhealthy" routines with clear productivity/mood differences.
- Insights that can guide individuals in optimizing their routines.

Tools & Technologies

- **Programming:** Python (NumPy, Pandas, scikit-learn, Matplotlib, Seaborn)
- **Modeling:** Linear Regression, Random Forest, Decision Tree, SVM, K-Means
- **Development Environment:** Jupyter Notebook, Google Colab
- **Version Control:** Git/GitHub for collaborative code management

Conclusion

This project will provide actionable insights into how morning routines affect productivity and mood. By applying machine learning models, the project not only highlights predictive patterns but also demonstrates the practical relevance of data science in everyday life. The findings could be extended to wellness and productivity tools for students and professionals, making it a locally and globally relevant application.