Machine Learning
(Mini Project)

THE SLEEP HEALTH REPORT

PREDICTING SLEEP HOURS USING MACHINE LEARNING

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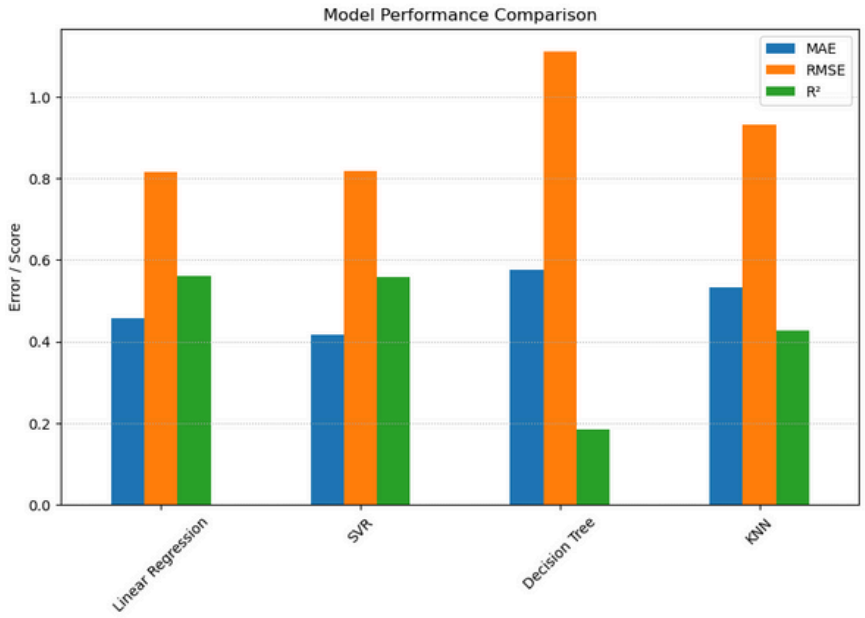
THE SLEEP HEALTH REPORT

1. Introduction

Sleep health is influenced by daily habits. This project predicts sleep hours using machine learning and features like workout, reading, phone time, work hours, caffeine intake, and relaxation.

2. Objectives

- Analyze a dataset of lifestyle and health-related factors.
- Build machine learning models to predict daily sleep duration.
- Compare models based on MAE, RMSE, and R^2 to select the most accurate.
- Provide actionable insights into factors affecting sleep.



THE SLEEP HEALTH REPORT

Method, Results & Insights

Method

Dataset: sleeptime_prediction_dataset.csv, 2,000 records, 6 features, no missing or duplicate values.
Preprocessing: Scaled numeric features using MinMaxScaler (0–1 range), data split into 80% train and 20% test.
Models: Linear Regression, SVR, Decision Tree, and KNN compared.

Results

Model	MAE	RMSE	R^2
Linear Regression	0.4574	0.8169	0.5601
SVR	0.4157	0.8180	0.5588
Decision Tree	0.5750	1.1113	0.1858
KNN	0.5325	0.9329	0.4262

Insights & Conclusion

Lifestyle factors (phone, work, relaxation, caffeine) impact sleep hours.
Linear Regression and SVR offer the best accuracy for this dataset.
Machine learning enables effective analysis and prediction of sleep patterns for wellness improvement.

Thank You