

# Project Proposal

## Title: Predicting Sleep Disorders Based on Lifestyle and Health Data

### Team Details

Team Name: Three-Eyed Ravens

Team Members:

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### Problem Statement

Sleep disorders such as insomnia, sleep apnea, and poor sleep quality are increasingly prevalent due to modern lifestyle and health factors. They negatively impact physical health, mental well-being, productivity, and overall quality of life. Early prediction of potential sleep disorders can prevent escalation, reduce healthcare costs and encourage healthier routines.

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### Data Source

We will use the **Sleep Health and Lifestyle Dataset** from Kaggle:

<https://www.kaggle.com/datasets/uom190346a/sleep-health-and-lifestyle-dataset>

Some key features include: **Demographics**: Age, Gender, Occupation, **Lifestyle**: Work hours, Exercise, Screen time, Caffeine/Alcohol intake, **Health Indicators**: BMI, Blood Pressure, Stress levels, **Sleep Data**: sleep duration, sleep quality, sleep disorder diagnosis.

### Approach

1. **Data Preprocessing**: Handle missing values, encode categorical variables, normalize continuous data, and manage outliers.
2. **Exploratory Data Analysis (EDA)**: Visualise correlations between lifestyle & sleep, and identify patterns (e.g., stress/work hours impact).
3. **Model Development**: Apply Logistic Regression (disorder classification), and Linear Regression (sleep duration/quality).
4. **Model Evaluation**: Accuracy, Precision, Recall, F1, ROC-AUC (classification); RMSE, MAE (regression).

### Expected Outcomes

- A predictive model to estimate risk of sleep disorders based on health and lifestyle factors.
- Provide insights into major factors affecting sleep quality and disorder likelihood, enabling targeted health interventions.
- A framework extendable to preventive healthcare tools in workplaces, universities, and clinics.
- Increased awareness of how lifestyle choices affect long-term sleep health.