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# PRD: Stress Prediction System

# Problem Alignment

## The Problem

The opportunity comes when stress can lead to serious illness in the future if not properly taken. In journal “The effects of chronic stress on health: new insights into the molecular mechanisms of brain–body communication” it shows that Diseases whose development has been linked to both stress and inflammation include cardiovascular dysfunctions, diabetes, cancer, autoimmune syndromes and mental illnesses such as depression and anxiety disorders. So it will be better if we can detect stress levels in our body, therefore we can take precaution early before serious illness comes.

By addressing the challenge, we create a system that can predict stress levels based on metric healthy lifestyle. Hence the people will take precautionary action early.

## High-Level Approach

Stress level prediction will be using machine learning methodology and healthy lifestyle features in the dataset to decide stress level on a certain person. The system will show the stress level of a person after getting info of some healthy lifestyle input such as sleep disorder, blood pressure, BMI, etc.

## Goals & Success

I will use metric level stress and translate it into ML metrics with 3 different metrics (MAPE, RMSE, and R2). These 3 ML Metrics would represent the success of the model and predict “level stress” from the user. The reason for choosing 3 ML metrics, because I need to ensure accuracy of a model that predicts the stress level. By comparing those 3 metrics, I might deliver a more trusted result in terms of prediction.

## Solution Alignment

### Key Solution

In this project we will be using <https://www.kaggle.com/datasets/uom190346a/sleep-health-and-lifestyle-dataset> as a dataset. The dataset consists of 400 rows and 13 columns, containing various variables related to sleep health and lifestyle. The columns and their descriptions are as follows:

1. Person ID: Unique identifier for each individual.
2. Gender: Gender of the person (Male/Female).
3. Age: Age of the person in years.
4. Occupation: Person's occupation or profession.
5. Sleep Duration (hours): Number of hours slept by the person in a day.
6. Sleep Quality (scale: 1-10): Subjective evaluation of sleep

quality on a scale from 1 to 10.

7. Physical Activity Level (minutes/day): Number of minutes spent on daily physical activity.

**8. Stress Level (scale: 1-10): Subjective evaluation of stress level on a scale from 1 to 10.**

9. BMI Category: BMI category of the person (e.g., Underweight, Normal, Overweight).

10. Blood Pressure (systolic/diastolic): Measurement of blood pressure represented through diastolic over systolic pressure.

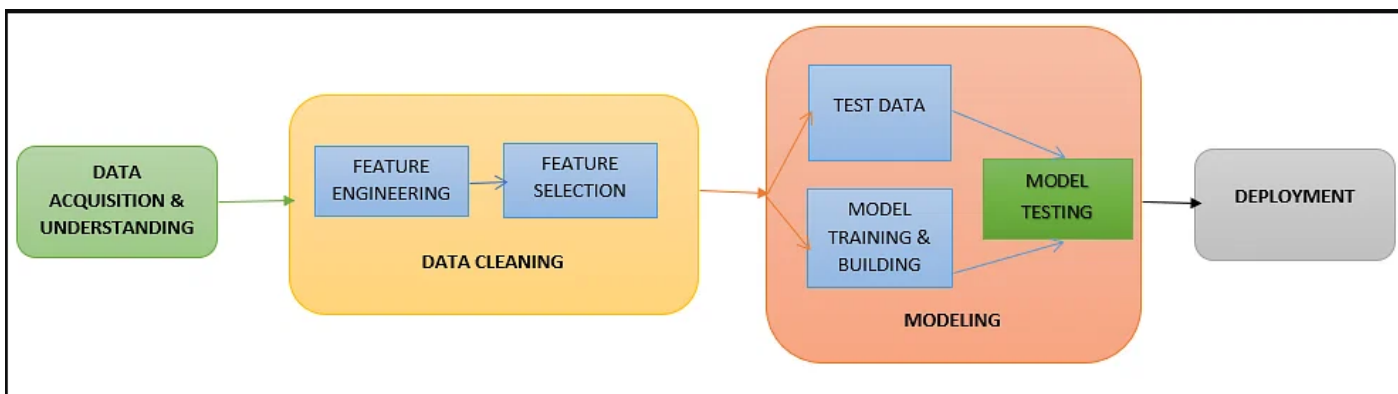
11. Resting Heart Rate (bpm): Resting heart rate of the person in beats per minute.

12. Daily Steps: Number of steps taken by the person in a day.

13. Sleep Disorder: Presence or absence of a sleep disorder in the person (None, Insomnia, Sleep Apnea).

I will use Linear Regression as the main model methodology for the system.

## Key Flows



# Launch Readiness

## Key Milestones

Date	Milestone	Description
Sept 13	Brainstorm Idea	Brainstorm idea and what are problem need to be solve
Sept 15	Gathering Dataset	Finding dataset
Sept 18	PRD docs	Finish Creating PRD Docs
Sept 20	EDA Stage 1	Early EDA, gathering info data, making some question for stage 2 EDA
Sept 23	EDA Stage 2	Advance EDA, conducting some AB Test, answering some question
Sept 21	Feature Engineering	Performing feature engineering numerical and categorical feature
Sept 25	Feature Selection and split dataset	Choosing some feature and conduct splitting dataset into train and test
Sept 30	Modeling	Create ML model and conduct train & test, hyperparameter tuning
Oct 5	Deploying	Deploy model ML into UI web
Oct 12	Reporting	Finish Creating Final Report
Oct 13	Video Demo	Finish Creating video demo

## Artifacts

*Put all the details and models of your milestone*

Artifacts	Where to check?
Dataset Final	<a href="https://www.kaggle.com/datasets/uom190346a/sleep-health-and-lifestyle-dataset">https://www.kaggle.com/datasets/uom190346a/sleep-health-and-lifestyle-dataset</a>
Github	<a href="https://github.com/WidharDwiatmoko/stress-level-prediction">https://github.com/WidharDwiatmoko/stress-level-prediction</a>
App	TBU

## References

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5137920/#:~:text=Diseases%20whose%20development%20has%20been,as%20depression%20and%20anxiety%20disorders.>
2. Kaggle Dataset : Sleep Health and Lifestyle Dataset
3. Pacmann Course : Intro ML and ML Process