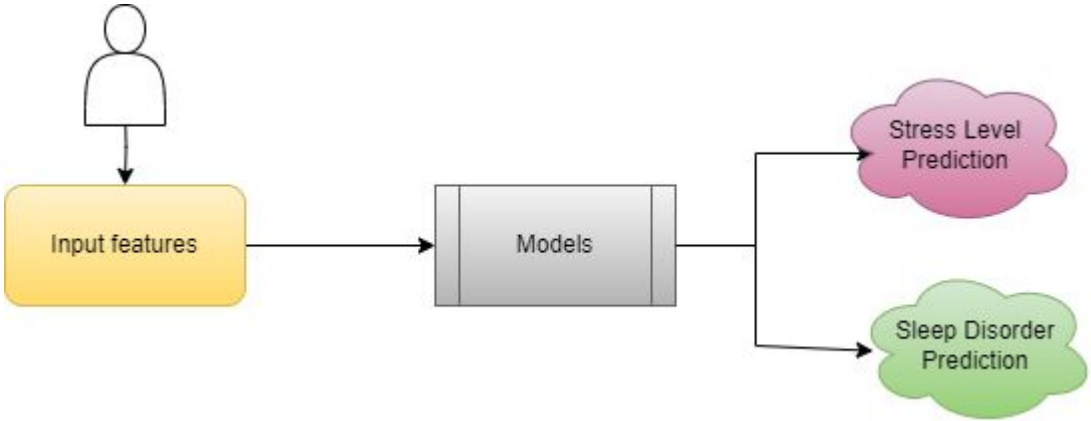
# *'Predicting Stress and Sleep Disorders Using Health and Lifestyle Data'*

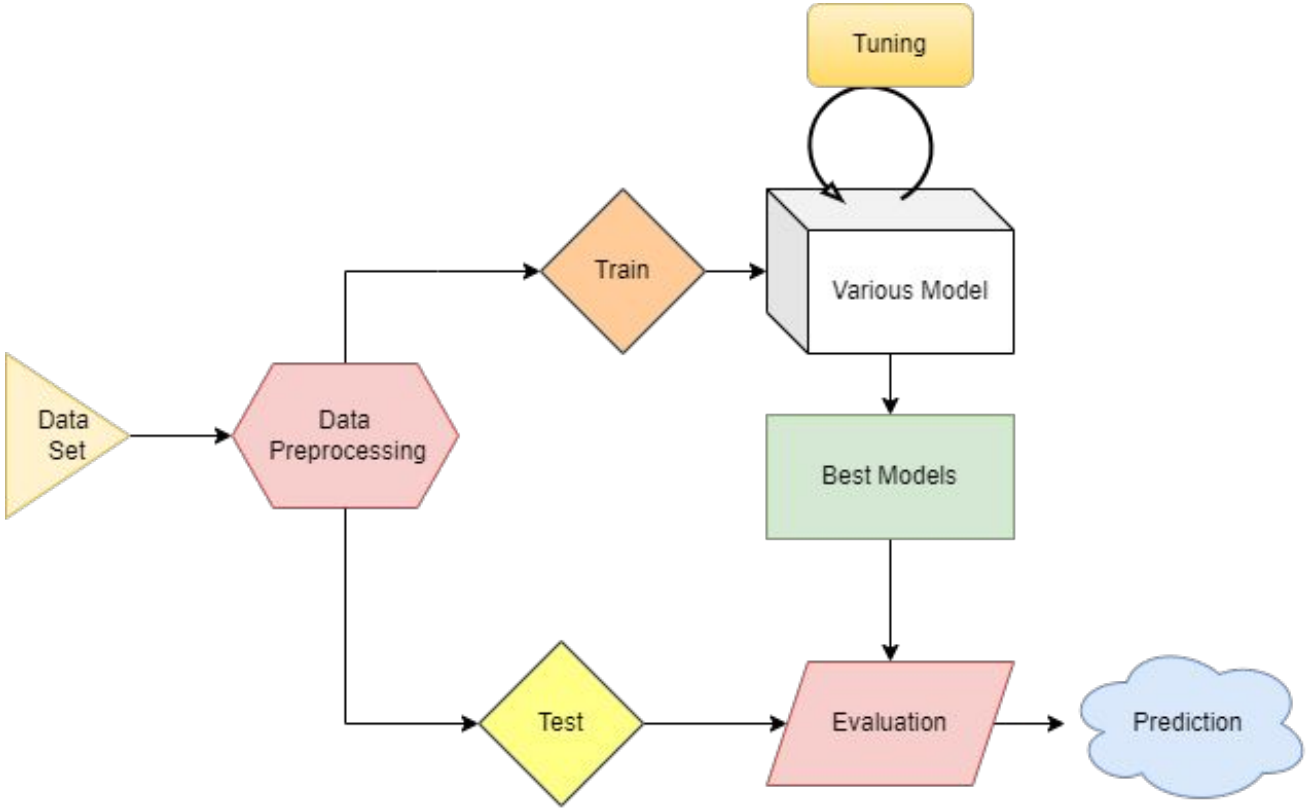
**Objective:**

To develop machine learning models that predict stress levels and sleep disorders based on health, lifestyle, and personal attributes, providing early insights.




Model Flow

# Process Flow



# Models Vs Metric(test data)

## Regression

| Model | r2_score |
|---|---|
| Linear regression (deg = 3) | 0.9366 |
| Random Forest Regressor | 0.9992 |
| Gradient Boosting Regressor | 0.9988 |
| Adaboost Regressor | 0.9534 |
| Xgboost | 1.0000 |
| Bagging Regressor | 0.9964 |

## Classification

| Model | Accuracy |
|---|---|
| Random Forest Classifier | 0.9464 |
| Gradient Boosting Classifier | 0.9464 |
| Adaboost Classifier | 0.8839 |
| Bagging Classifier | 0.9375 |
| Xgboost | 0.9464 |
| SVM(C:7.7,degree:1,kernel: rbf) | 0.95 |

# Effect of Resampling in SVM

-Normal:-

The classification report after using randomized search CV

| | precision | recall | f1-score | support |
|---|---|---|---|---|
| 0 | 0.96 | 0.85 | 0.90 | 27 |
| 1 | 0.96 | 0.99 | 0.98 | 111 |
| 2 | 0.90 | 0.90 | 0.90 | 30 |
| accuracy | | | 0.95 | 168 |
| macro avg | 0.94 | 0.91 | 0.93 | 168 |
| weighted avg | 0.95 | 0.95 | 0.95 | 168 |

OverSampling:- (No effect)

The classification report after using randomized searchCV for smot

| | precision | recall | f1-score | support |
|---|---|---|---|---|
| 0 | 0.96 | 0.85 | 0.90 | 27 |
| 1 | 0.96 | 0.99 | 0.98 | 111 |
| 2 | 0.90 | 0.90 | 0.90 | 30 |
| accuracy | | | 0.95 | 168 |
| macro avg | 0.94 | 0.91 | 0.93 | 168 |
| weighted avg | 0.95 | 0.95 | 0.95 | 168 |

UnderSampling (Decreased Accuracy)

The classification report after using randomized search CV for undersampling

| | precision | recall | f1-score | support |
|---|---|---|---|---|
| 0 | 0.88 | 0.78 | 0.82 | 27 |
| 1 | 0.96 | 0.94 | 0.95 | 111 |
| 2 | 0.75 | 0.90 | 0.82 | 30 |
| accuracy | | | 0.90 | 168 |
| macro avg | 0.86 | 0.87 | 0.86 | 168 |
| weighted avg | 0.91 | 0.90 | 0.91 | 168 |