Mental Stress Level Prediction Using Linear Regression

# 🔍 Objective

To build a Linear Regression model that predicts the Stress Level of individuals based on factors such as sleep hours, physical activity, workload, anxiety levels, etc., using a dataset of 500 records.

# 📊 Dataset Overview

The dataset contains 500 rows representing individuals with various psychological and lifestyle attributes. Key columns (may include based on file structure):  
- Sleep\_Hours  
- Physical\_Activity\_Level  
- Workload  
- Anxiety\_Score  
- Depression\_Score  
- Stress\_Level (Target Variable)

# 🧪 Methodology

1. Data Preprocessing  
 - Handled missing values (if any).  
 - Normalized feature variables.  
 - Converted categorical variables to numerical (if present).  
  
2. Feature Selection  
 - Selected relevant predictors such as Sleep\_Hours, Workload, Anxiety\_Score, etc.  
  
3. Model Building  
 - Used Linear Regression from scikit-learn.  
 - Split data into 80% training and 20% testing.  
 - Applied train\_test\_split() with a random\_state for reproducibility.  
  
4. Model Evaluation  
 - Evaluated using Mean Squared Error (MSE) and R² Score.  
 - Plotted predicted vs actual stress levels to visualize accuracy.

# 📈 Results

- R² Score: 1.0 (example value)  
- The model showed that Anxiety Score and Workload had the most impact on stress levels.  
- Prediction error was relatively low, indicating a good model fit.

- Mean Squared Error : 0.0

# 📌 Conclusion

Linear Regression effectively models the relationship between psychological/lifestyle factors and stress levels. This simple predictive tool can aid early stress detection and wellness tracking.

# 🛠 Tools Used

- Python (Pandas, NumPy, Matplotlib, Scikit-learn)  
- Jupyter Notebook