

# Analysis of Variance and Linear Models

## Description for Video Presentation

### Task 1: Analysis of Variance (ANOVA)

Objective: Apply ANOVA to determine if there's a significant difference in the mean of the dependent variable across categories.

Findings:

- We examined the effect of having a history of mental health issues on stress levels.
- Individuals with a mental health history have a higher average stress level.
- ANOVA showed a statistically significant difference in stress levels based on mental health history.
- Visualizations further confirmed these findings.

Conclusion: Mental health history is a significant predictor of stress levels.

### Task 2: Linear Regression Model

Objective: Develop a linear model to predict stress levels using various independent variables.

Findings:

- A linear regression model was built using factors such as anxiety level, self-esteem, and more.
- The model's coefficients provide insights into how each factor impacts stress levels.
- The model's significance was evaluated using the F-test.

Conclusion: Several factors, including mental health history, play a role in predicting stress levels.

## Task 3: Assumptions and Limitations

Objective: Discuss assumptions and limitations of ANOVA and linear models.

Findings:

- Both ANOVA and linear regression come with specific assumptions like normality, independence, and homoscedasticity.
- Violating these assumptions can lead to biased results.
- Solutions include data transformations, non-parametric tests, and regularization in regression.

Conclusion: It's crucial to understand and address model assumptions for accurate results.

## Task 4: Mini-Project

Objective: Combine analyses from previous tasks into a cohesive mini-project.

Findings:

- We aimed to determine if a history of mental health issues predicts higher stress levels.
- Both ANOVA and linear regression analyses confirmed the significance of mental health history in predicting stress levels.

Conclusion: There's a clear association between mental health history and stress levels, emphasizing the need for mental health support.