**Team Members:**

* **Hanna Jossy**
* **Fatima Asif**
* **Medha Madhub**

Team member tasks are divided as follows:

* **Hanna Jossy** will handle data gathering and basic analysis.
* **Fatima Asif** will focus on feature creation and data visualization.
* **Medha Madhub** will build and evaluate the predictive model."

**Task Distribution:**

* **Hanna Jossy (Data & Basics):**
  + Works on explaining the hypothesis.
  + Works on gathering and describing the data.
  + Works on basic statistical analysis and visualizations.
  + Works on setting up prediction variables.
* **Fatima Asif (Features & Visuals):**
  + Works on creating new features from the data.
  + Works on creating visuals to explain the data.
* **Medha Madhub (Model & Results):**
  + Works on building the predictive model.
  + Works on evaluating the model's performance.
  + Works on gathering the necessary data and code related to the model.

GitHub: <https://github.com/MedhaMadhub/Python-project.git>

Hypothesis: Does Student Behavior Influence Academic Performance?

Over the years, there has been growing interest in understanding how student behavior impacts academic success. Factors such as study habits, class attendance, sleep patterns, and extracurricular activities may play a significant role in determining performance outcomes. By examining these behavioral patterns, we can assess whether certain habits contribute to higher grades or if external factors are more influential.

There are several possible explanations for variations in academic performance:

1. **Study Consistency** – Regular study schedules may lead to better retention and understanding of material.
2. **Class Attendance** – Students who attend classes more frequently might perform better due to increased engagement.
3. **Sleep Patterns** – Adequate rest could enhance cognitive function, while irregular sleep schedules may hinder focus.
4. **Extracurricular Activities** – Participation in clubs or sports might develop time management skills or, conversely, reduce study time.

This project will explore whether specific student behaviors directly correlate with academic performance or if other factors, such as curriculum difficulty or personal circumstances, play a larger role. By analyzing study habits, attendance records, and performance metrics, we aim to uncover meaningful insights into the relationship between student behavior and academic success.

Dataset: <https://www.kaggle.com/datasets/mahmoudelhemaly/students-grading-dataset>

### Plan for testing the hypothesis

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1. **Data Collection and Cleaning**We will first collect a dataset related to student behavior and academic performance. This dataset will include attributes such as study hours, class attendance, sleep patterns, and GPA. Once collected, we will clean the data by removing incomplete or irrelevant records to ensure accuracy and consistency in our analysis.
2. **Basic Statistics**We will calculate basic statistics such as average study hours, attendance rate, sleep duration, and GPA. Using Python’s Pandas library, we will analyze these metrics to get an initial understanding of the dataset and identify any potential trends.
3. **Data Visualization**We will use Python libraries like Matplotlib and Seaborn to create visualizations such as histograms, scatter plots, and bar charts to explore the relationships between student behaviors and academic performance. A correlation heatmap will also be generated to identify strong or weak associations between different factors.
4. **Testing the Hypothesis**We will perform statistical analyses to determine the relationship between student behavior and academic performance. This will involve comparing GPA distributions based on different study habits, attendance rates, and sleep patterns. Appropriate statistical tests, such as correlation analysis or regression models, will be applied to evaluate significance.
5. **Evaluation and Conclusion**After testing the hypothesis, we will compare the results to our initial assumptions. The findings will help determine whether student behavior directly impacts academic performance or if other factors play a larger role. Based on the results, we will assess whether our hypothesis is supported or needs reconsideration.