**Evaluation of Academic Performance of Students**

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**Project Description**

This project implements a fuzzy logic system to evaluate a student's overall performance based on three key factors:

1. Attendance (scaled from 0 to 100%))
2. Internal Marks (scaled from 0 to 100%))
3. External Marks (scaled from 0 to 100%))

The system uses the Mamdani Fuzzy Inference Technique, which is widely recognized for its intuitive and straightforward rule-based approach. Each input variable is categorized into five linguistic labels: Poor, Average, Good, Very Good, and Excellent. Similarly, the output variable Performance is divided into the same categories.

Membership functions are defined using trapezoidal fuzzy sets:

* Inputs (attendance, internal marks, external marks) and the output (performance) are categorized with trapezoidal membership functions.

The fuzzy system integrates membership functions and a comprehensive set of rules to infer the performance of students. For example:

* If attendance is Poor AND external marks are Poor AND internal marks are Poor, THEN performance is Poor.

The output of the system is a numerical value representing performance, defuzzified from fuzzy linguistic values. This project serves as a practical demonstration of applying fuzzy logic in educational evaluation and decision-making systems.

**Language and Software Used**

1. Programming Language, IDE: Python. Pycharm
2. Libraries:
   * NumPy: For numerical operations.
   * skfuzzy: To create and manage fuzzy variables and inference systems.
   * Matplotlib: For visualizing membership functions and results.