**Report plateforme d'apprentissage personnalisée** **(IMRaD**)

# INTRODUCTION

Uniform education methods fail to address the diversity of student learning profiles. A personalized learning platform can enhance educational efficiency by dynamically adapting resources to each student's performance, behavior, and needs. This project aims to develop an intelligent system based on machine learning techniques that delivers personalized and adaptive learning support.

# METHODS

- Dataset: Students Performance in Exams (Kaggle), 1000 entries. Features include gender, ethnicity, parental education level, math, reading, and writing scores.  
- Data preprocessing:  
 • Encoding categorical variables (LabelEncoding)  
 • Computing average score per student  
 • Adding new features (e.g., preparation course indicator)  
- Tools: Python, pandas, scikit-learn  
- Initial ML model: Linear regression to predict the average score based on student characteristics.

# RESULTS

The linear regression model shows a positive correlation between taking a preparation course and the average score. Parental education level also significantly influences student outcomes. Preliminary segmentation (clustering) identified learner profiles likely to benefit from tailored content.

# DISCUSSION

These initial results confirm the feasibility of data-driven personalization. Next steps involve integrating dynamic content recommendations, analyzing temporal progress, and testing with real users. Real-time intelligent feedback is expected to enhance engagement and learning efficiency.

# APPENDICES

- Dataset: https://www.kaggle.com/datasets/spscientist/students-performance-in-exams  
- Sample preprocessing code (see source document)  
- Visualizations to be added (correlation, distribution, clustering)