PROJECT_REPORT_DataKraft4P

Presented By: DataKraft4P

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Title: Student Performance Analysis: Analyze academic scores and performance patterns.

Introduction:

Academic performance is a significant factor in shaping a student's future. Understanding the key indicators that influence student outcomes is crucial for educators, parents, and institutions. This project focuses on analyzing student performance data using data analysis tools (like Excel and Power BI) and techniques to uncover hidden patterns, identify at-risk students, and enable data-driven decisions to enhance academic results.

Problem Statement:

Students' academic achievements are influenced by various factors, such as socio-economic status, parental education, lunch type, and test preparation. However, it is often challenging to determine which factors significantly affect performance. This project addresses the challenge by applying data analysis to predict student performance based on these features.

Objective:

To develop a visualization based analytical model that can represent student performance and identify the most impactful features. The model aims to assist in timely intervention, personalized learning, and strategic educational planning.

Why This Problem?

With growing educational datasets, analyzing student data can help recognize patterns that are not easily visible. Accurate insights into factors impacting student success can help in designing more effective teaching strategies, resource allocation, and student counseling.

Solution:

The project uses data visualization and data algorithms to derive insights from a student performance dataset. Key features include gender, parental level of education, lunch type, and test preparation course. The model was built using a Jupyter Notebook and includes preprocessing, visualization, feature analysis, model training, and evaluation.

Features:

- Insightful data visualization to identify key trends
- Correlation analysis of attributes
- Model performance evaluation using accuracy, precision, recall, and F1 score
- Implementation using Python, pandas, seaborn, sklearn, and matplotlib

Technical Implementation:

The Jupyter Notebook includes the following major steps:

- Data Loading and Cleaning
- Exploratory Data Analysis (EDA)
- Feature Selection and Preprocessing
- Model Training using Classification Algorithms
- Evaluation using metrics like accuracy and confusion matrix

Why IBM Resources and Tools?

IBM SkillsBuild provided the platform and guidance for project-based learning. IBM's tools and cloud-based infrastructure ensure reliability, scalability, and advanced analytics capabilities.

Conclusion:

This project successfully analyzed student performance and implemented data visualization models to represent outcomes. The insights gained can contribute to improving academic planning, helping educators tailor interventions based on data.