Students Performance Analysis

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Solving business problems with AI-ML

AI-ML is slowly becoming the go-to solution for any business problem. There is a middle ground that allows us to effectively integrate artificial intelligence into our daily lives and businesses. Artificial intelligence (AI) and machine learning (ML) have become an essential part of the toolset for many organizations. When used effectively, these tools provide actionable insights that drive critical decisions and enable organizations to create exciting, new, and innovative products and services.

There are several aspects of this, this can be

1. Predictive solutions,
2. Descriptive solutions,
3. Prescriptive solutions.

There are several stages in the business problem solving via AI-ML this can be described as following:

1. Defining the problem
2. Understanding the data and the prospective problem associated with it
3. Visualizing the data
4. Identifying the approach/ algorithm for the data
5. Running tests and relating the variables
6. Interpretation of the results.

When dealing with the business problem we will know the real and goal and the stakeholder of the problem, these often come with deadlines and demands for a feasible solution.

Prediction solutions:

These are the problems related to forecasting future possibilities with respect to the data collected so far. The most commonly known problem for this dataset is the comparing and forecasting the prices of offices/houses for rent after the terrorist attack on the world trade center on 9-11. The house price detection was done by comparing the no. of bedrooms and washrooms available and the proximity to the nearby supermarkets. The application of the gradient descent in this example proved to be a valid algorithm, for interpretations.
This problem was solved by the linear regression method using it as an effective algorithm to understand the dependency of the model on the market trends.

Another real-life example of this predictive solution is the Spam filter on emails and predicting whether an email is to be marked spam or not.

Descriptive solutions:

Descriptive solutions are the ones where no immediate action is required only interpretation of the problem is sufficient. This is applicable for the study cases and sets of data to understand the role of artificial intelligence in the market and its effect on the same.
For example: Studying about the heart attack rates and its causes for research purposes is one such descriptive analysis application.

Prescriptive solutions:

Prescriptive solutions is one such like the Target and Walmart approach to understand the correlation between the purchases of one commodity with respect to other. They used the prescriptive analysis via AI to understand why new dads bought diapers and beer together. This helped them to understand the correlation between two completely unrelated items and also predict such future combinations to enhance and stock their supermarkets with those items.

Data set taken – Student Performance Dataset

The student performance dataset resembles the variables in which the dependency of the preparation of the test course and marks obtained in the math, reading and writing tests are predominantly interdependent.

The dataset gives us various parameters like lunch type, education level of parents, reading, writing and math scores, preparation level of tests, etc.

Analysis of the dataset:

There are interdependencies in the dataset and we can identify it by plotting graphs in the dataset.

Conclusions:

1. Females scored better in writing and reading scores
2. Males scored better in math scores
3. Parental level of education was responsible for good scores, parents with master's degree have children scoring well
4. Lunch is also a factor, students skipping lunch did not perform well in the tests.