PARSHVANATH CHARITABLE TRUST'S
A. P. SHAH INSTITUTE OF TECHNOLOGY
Department of Information Technology
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Sales Prediction

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Project Guide
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1. Introduction

- Sales prediction plays an important role in many fields and helps to improve the sales of a company by making future plans by predicting the sales of a company.
- Sales prediction is an important prerequisite for enterprise planning and correct decision making, allowing companies to better plan their business activities
- In this project, we will use machine learning techniques to analyze the historical sales data of Big Mart and develop a predictive model that can forecast the sales for the future.

2. Objectives

- To develop an accurate and reliable model that can predict sales for each product in each store
- To determine the amount of product that will be required in future.
- To compare and evaluate the performance of prediction algorithms.
- To create a machine learning model that can help Big Mart improve their business operations and stay ahead of the competition

3. Scope

- **Sales forecasting:** Machine learning models can be trained to analyze historical sales data and predict future sales trends, allowing retailers to adjust their inventory and staffing according
- **Customer segmentation:** Machine learning algorithms can be used to group customers based on their buying behavior, demographics, and preferences, allowing retailers to personalize their marketing efforts and optimize their sales strategies.
- **Product recommendations:** Machine learning models can be used to analyze customer purchase history and recommend products that are likely to be of interest to them.
- **Price optimization:** Machine learning can be used to identify optimal pricing strategies based on customer behavior, competitor pricing, and market trends.

4. Literature Survey

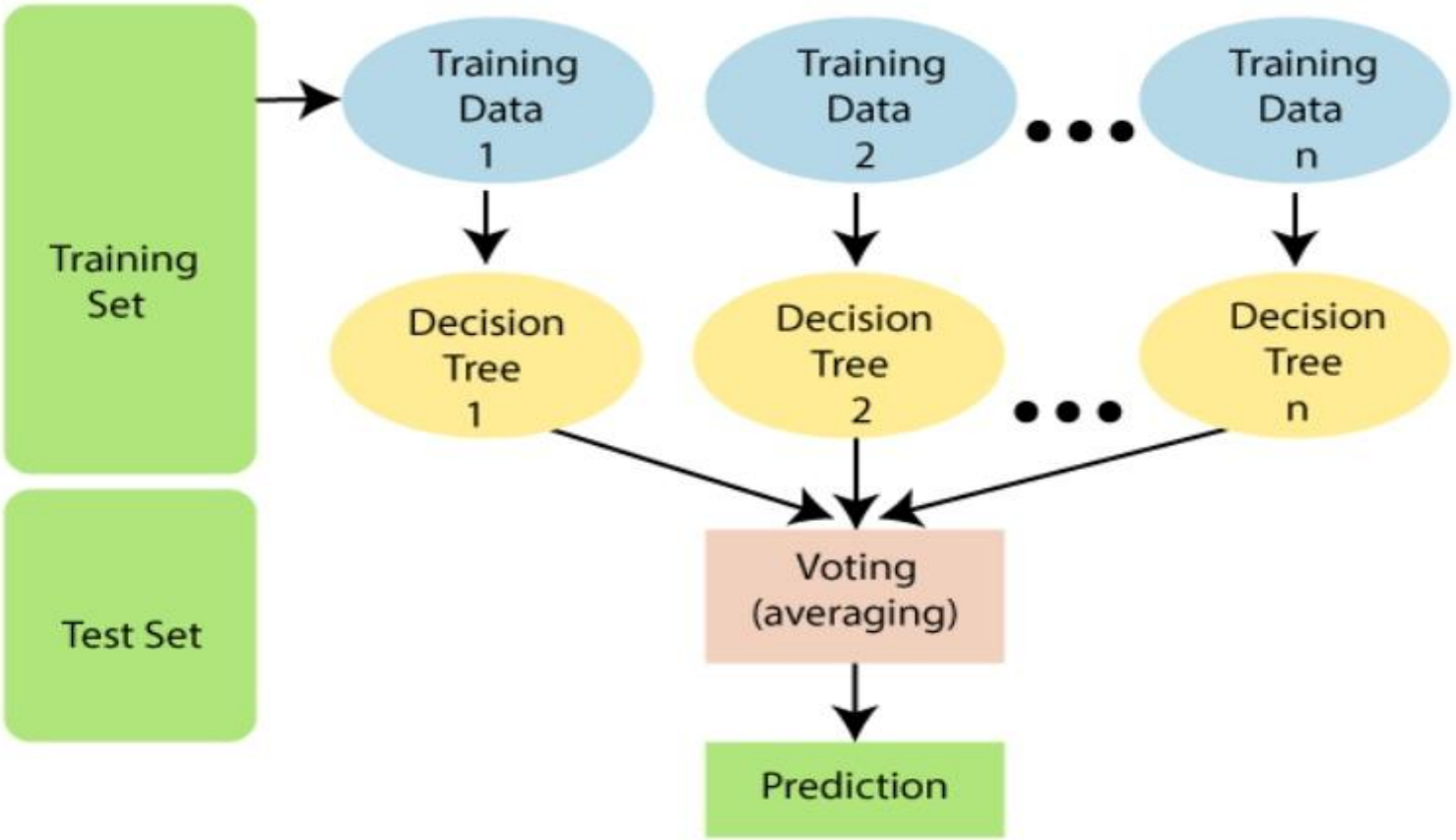
Title	Author	Algorithm's Used	Result
Big Mart Sales Prediction	Akshay Arora, Sudhanshu Kumar	Random Forest, Linear Regression, Decision Tree.	Random Forest achieved highest frequency.
Sales Prediction of Big Mart using Machine Learning	Manisha Borkar, Kalayani Thakre	K-nearest neighbor, Support vector regression.	Support vector regression achieved best accuracy.
Big Mart Sales using Machine Learning techniques.	Mitali Awari, Dr. Dlip Palange,	Random Forest, XgBoost, Ridge regression.	Random Forest achieved best frequency.

5. Proposed System

- The purpose of Big Mart sales prediction using machine learning is to use historical sales data and other relevant features to build a model that can accurately predict the sales of different products at different stores.
- Data cleaning and preprocessing techniques can be used to identify and fix these issues before training the prediction model.
- Use of forecasting techniques that can capture trends and seasonal patterns can help account for changes in the market and improve sales predictions.
- This proposed system can help retailers to better manage their inventory, optimize their pricing strategy, and improve their overall profitability.

6. Algorithm Used

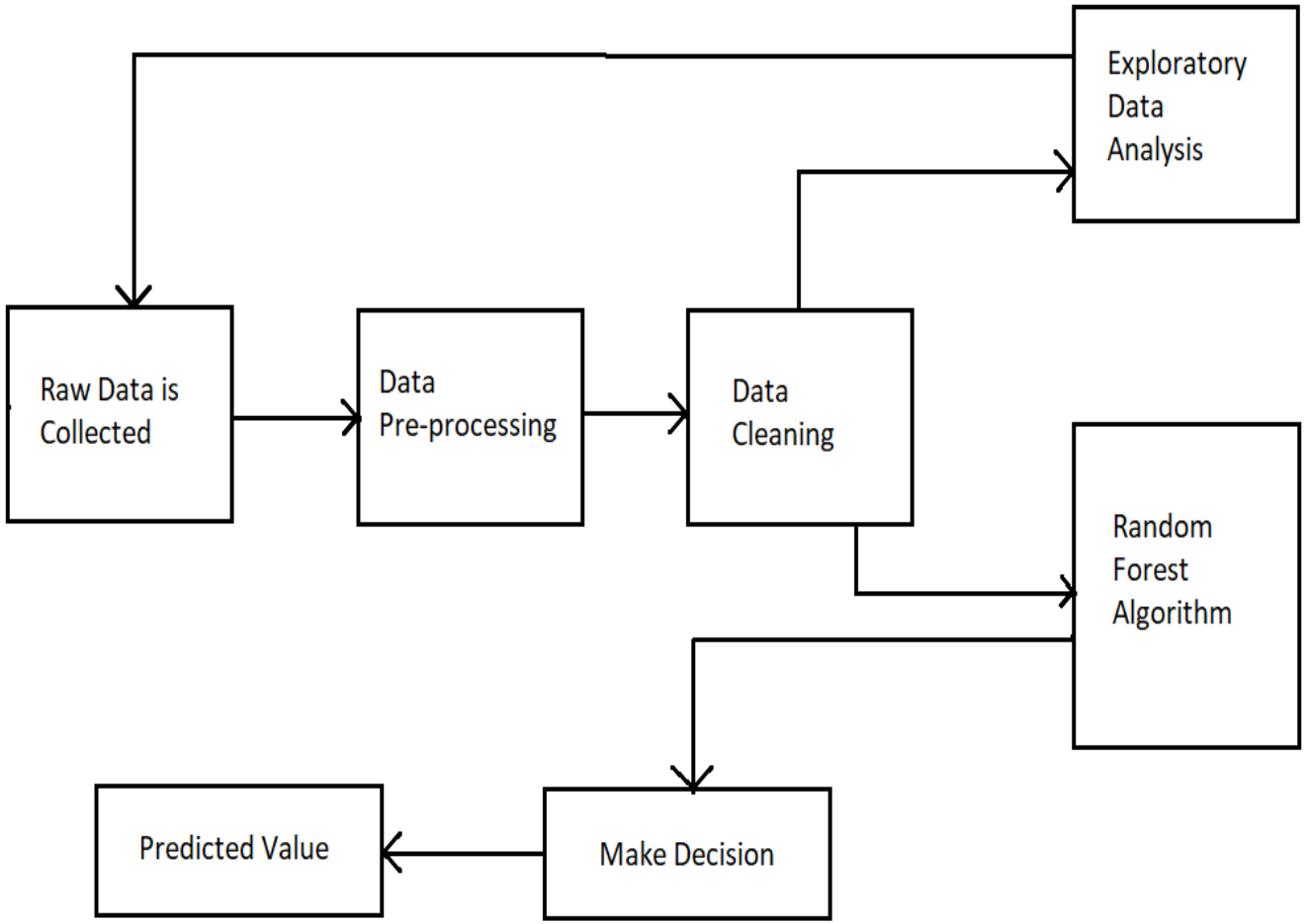
- **Random Forest Regressor:-**



7. Outcome of Project

- Accurate sales prediction: The main objective of the project would be to accurately predict the sales of products at Big Mart. The model would be trained on historical sales data, and the output would be the predicted sales for future time periods.
- Identification of important features: The project could also identify which features have the greatest impact on sales. This information could be used by Big Mart to make strategic decisions, such as which products to stock or which promotions to run.
- Improved inventory management: Accurate sales predictions could help Big Mart manage their inventory more effectively, reducing the risk of overstocking or stockouts.
- Better decision making: With accurate sales predictions and a better understanding of which features impact sales, Big Mart could make more informed decisions about pricing, promotions, and product placement.

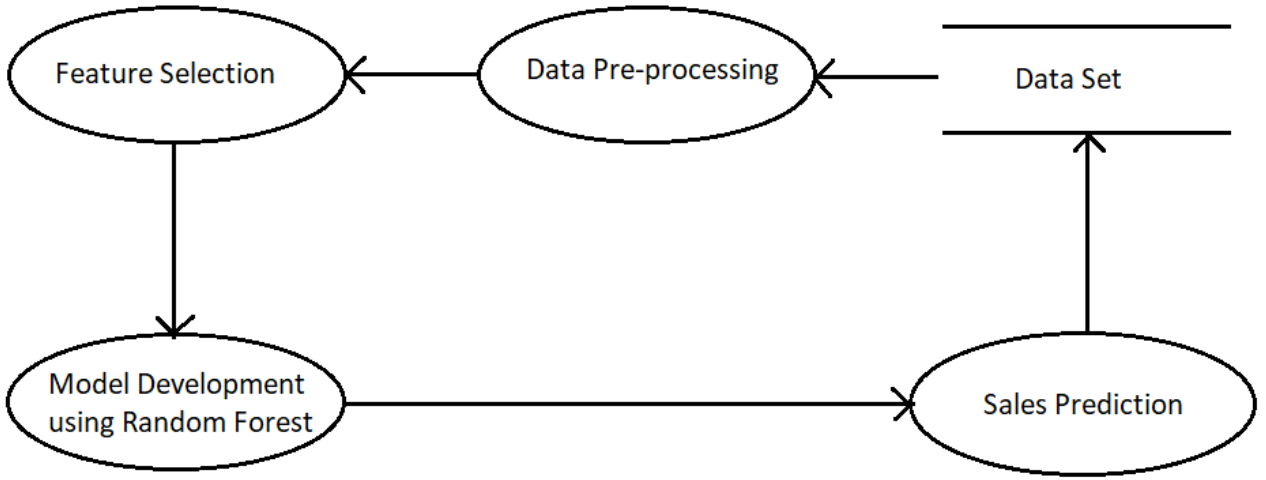
8. Block Diagram



9. Use Case/Data Flow Diagram

- **Level 0 DFD**

- **Level 1 DFD**


Feature Selection
Data Pre-processing
Data Set
Model Development using Random Forest
Sales Prediction

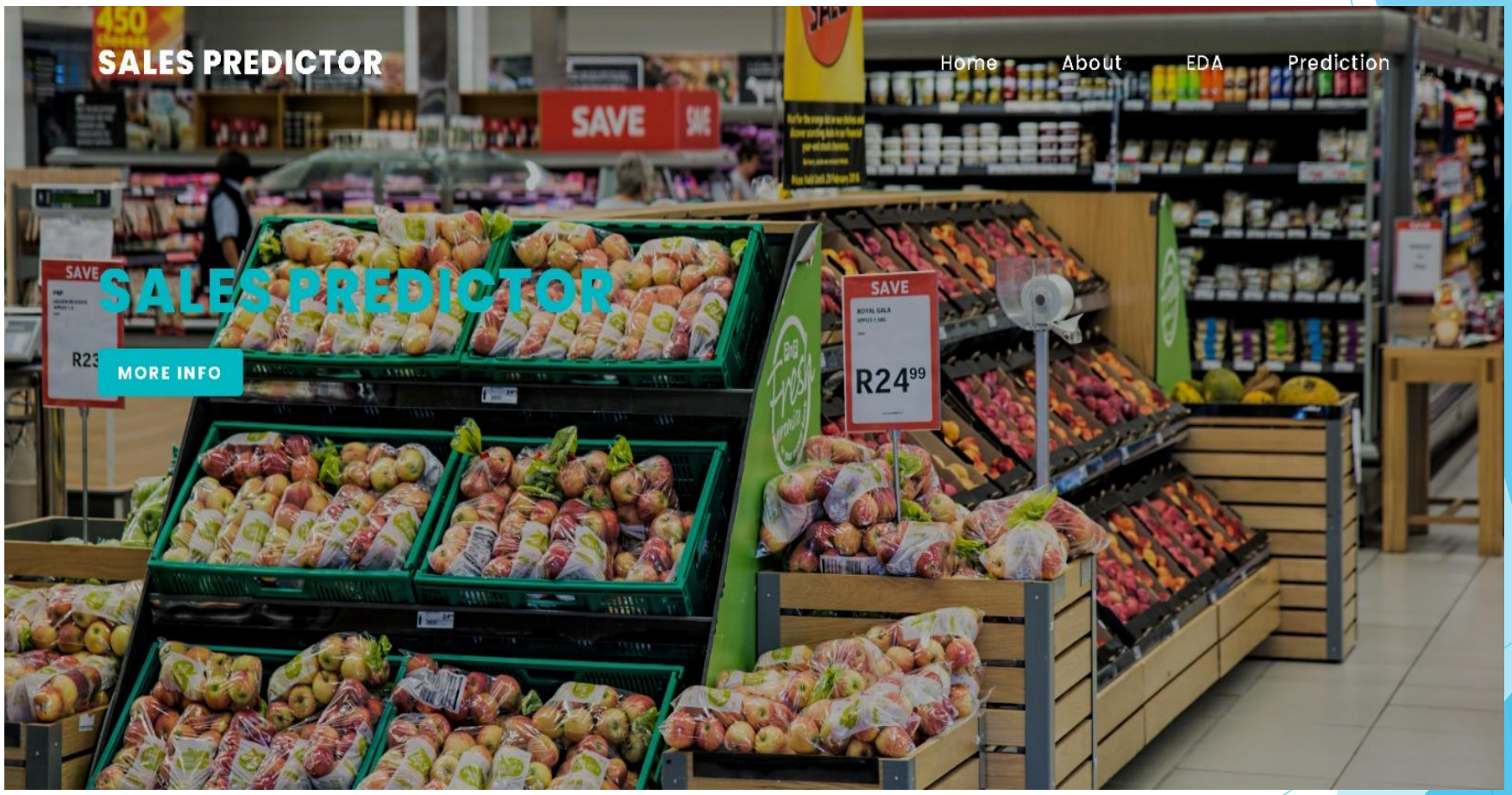
10. Technology Stack

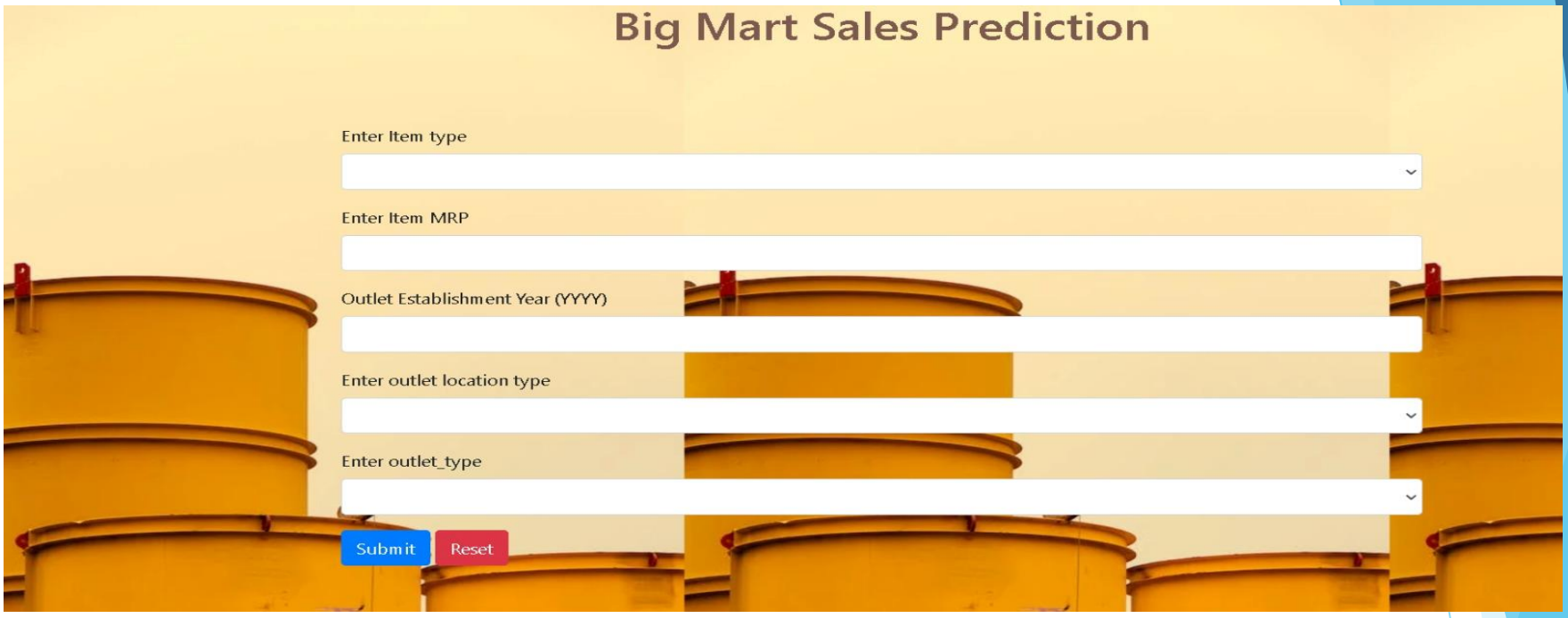
1. HTML
2. CSS
3. Flask
4. Python Using ML Algorithms

11. Suggestions in Review-1

1. New home page.
2. Dataset Visualization.
3. To show actual prediction.
4. Graphical Analysis.
5. To show weekly sales.

12. Result and Discussion





About

Sales forecasting software uses quantitative methods to analyze historical business data and trends – such as closed and won deals and win/loss records – and then produces an accurate report of expected sales revenue. Forecast reports compare sales targets with achieved sales versus expected sales. Businesses need accurate sales forecasts to help allocate resources, hire new staff, increase quotas, and manage costs. Sales forecasting tools enable companies to predict future growth trends and help leadership formulate effective strategies to expand their business. Sales forecasting software helps businesses answer these questions: What is our expected revenue? (Organized by salesperson, territory, or account.) How did actual sales compare to expected sales? Which method produces the most accurate forecast? Furthermore, publicly-traded companies have to report an accurate sales forecast because they know investors are looking for success, reliability, and stability each quarter. The sales forecasting software models are well-tested and robust, but users can adjust the models to tweak predictions and make them more accurate over time. Businesses can also modify the forecasts with "what if assumptions" to simulate sales behavior and market conditions.

EDA

Exploratory Data Analysis

Value	Count	Frequency (%)
Fruits and Vegetables	1232	14.5%
Snack Foods	1200	14.1%
Household	910	10.7%
Frozen Foods	856	10.0%
Dairy	682	8.0%
Canned	649	7.6%
Baking Goods	648	7.6%
Health and Hygiene	520	6.1%
Soft Drinks	445	5.2%
Meat	425	5.0%

13. Conclusion and Future Scope

Future Scope

- For future scope, the project can be improved by incorporating more advanced machine learning algorithms and data pre-processing techniques, such as feature engineering and data normalization. Additionally, incorporating external factors like market trends and economic conditions can also improve the accuracy of sales predictions.
- Finally, integrating the sales prediction model with other business intelligence tools can also help businesses gain a more holistic view of their operations and make better-informed decisions.

Conclusion

- The sales prediction project is a significant application of machine learning and predictive analytics in the business world. Through this project, we can analyze past sales data and use it to forecast future sales, which is invaluable for businesses in terms of making informed decisions regarding inventory, marketing, and pricing strategies.

Thank You...!!