High Level Design (HLD)

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STORES SALES PREDICTION

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HIGH LEVEL DESIGN (HLD)

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HLD)

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**Abstract**

Nowadays shopping malls and Big Marts keep the track of their sales data of each and every individual item for predicting future demand of the customer and update the inventory management as well. These data stores basically contain a large number of customer data and individual item attributes in a data warehouse. Further, anomalies and frequent patterns are detected by mining the data store from the data warehouse. The resultant data can be used for predicting future sales volume with the help of different machine learning techniques for the retailers like Big Mart. In this paper, we propose a predictive model using Random Forest technique for predicting the sales of a company like Big Mart and found that the model produces better performance as compared to existing models. A comparative analysis of the model with others in terms performance metrics is also explained in details.

**1 Introduction**

**1.1 Why this High-Level Design Document?**

The main purpose of this HLD documentation is to feature the required details of the project and supply the outline of the machine learning model and also the written code. This additionally provides the careful description on however the complete project has been designed end-to-end.

**1.2 Description**

**Problem Perspective**

The Stores Sales prediction may be a machine learning model that helps Stores to predict the sales of the store’s products and helps the users to understand the sale of the products.

**1.3 Problem Statement**

The most goal of the project is to form a programme that predicts the sales of the store’s products by taking bound input from the user like item\_type, item\_mrp and item\_establishment year etc.

**1.4. Project Solution**

Project requires the desired input of user from the created interface and method all the provided information to satisfy the wants of the machine learning model and at last show the expected output .

**1.5 Answer enhancements**

We will even predict the sale of store products considering whether or not is it a weekday, season or alternative social reasons. however, considering from the angle of business, if we have a tendency to method such information and predict the sale of the discounted store product, it'll bring some loss to the store company. therefore, this technique isn't thought-about.

**1.6 Technical needs**

There are not any hardware needs needed for victimization this application, the user should have AN interactive device that has access to the web and should have the fundamental understanding of providing the input. And for the backend half the server should run all the package that's needed for the process and provided information to show the results.

**1.7 Information needs**

The info demand is totally supported the matter statement. and also, the information set is accessible on the Kaggle within the type of standout sheet(.xlsx), because the main theme of the project is to induce the expertise of real time issues, we have a tendency to once more mercantilism {the information into the prophetess data base and commerce it into csv format.

**1.8Tools Used**

* Python 3.9 is employed because the programming language and frame works like numpy, pandas, sklearn and alternative modules for building the model.
* Visual Studio Code is employed as IDE.
* For visualizations seaborn and components of matplotlib are getting used.
* For information assortment prophetess info is getting used.
* Front end development is completed victimization HTML/CSS.
* Flask is employed for each information and backend readying.
* GitHub is employed for version management.
* Azure is employed for deployment.
* SQL SERVER IS USED FOR DATABASE.
* Power Bi is used for creating a report.

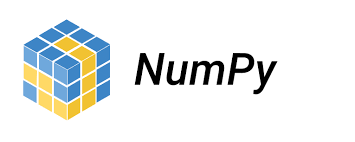
**1.9 Constraints**

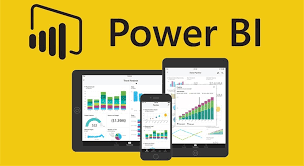
The Stores Sales Prediction answer should be user friendly, as automatic as attainable and also the user should not be needed to understand any of the operating.

**1.10 Assumptions**

The most objective of the project is to implement the utilization cases as for the new dataset that user provides through the programme. Machine learning model is employed for process the on top of computer file. It's additionally assumed that each one aspects of this project have the flexibility to figure along within the approach as the designer is expecting.





**2.1 and 2.2 Design Flow and Deployment Process**

PYTHON

SQL SERVER

Data (CSV)

EDA

DATA PREPROCESSING

IMPORT PYTHON LIBRARIES & READ DATA

FEATURE SELECTION

FITTING MODEL WITH RANDOM FOREST

FEATURE ENGINEERING

CREATING A WEB PAGE FOR DEPLOYMENT

SAVE MODEL IN PICKLE FILE

HYPER PARAMETER TUNNING

EXPORT DATA BACK TO SQL SERVER

DEPLOYMENT ON LOCAL HOST USING FLASK AND VS CODE

DEPLOYMENT ON AZURE

CREATING POWER BI REPORT

INPUT VALUE & PREDICT FINAL RESULT

**2.3 Logging**

Each step is being logged within the system that runs internally, that shows the date time and therefore the processed that has been performed, work is completed in several layers as information, DEBUG, ERROR, WARNINGS. this provides US the perceive of the logged info.

**2.4 Error Handling**

Once ever a slip is occurred, the reason are logged in its several log file, in order that the developer will rectify the error.

ARCHITECTURE

**3 Performance analysis**

**3.1 Reusability**

Elements of the code written is accustomed different applications and therefore the rest is changed and be reused.

**3.2 Application Compatibility**

The various parts for this project are exploitation python as associate interface between them. Every element can have its own tasks to perform, and it's the work of the python to make sure correct transfer of data.

**3.3 Resource Utilization**

Once any task is performed, it'll doubtless; use all the process power offered till that performs is finished.

**3.4 Deployment**

The model is being deployed on Azure.

**Conclusion**

The stores sales prediction will predict the worth supported the trained knowledge set within the rule. Therefore, the user will recognize the approximate value for his or her product.