Low Level Design (LLD)

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PETROL PRICE FORECASTING

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**Abstract**

The liberalization of the petroleum sector in Morocco has a significant effect for petroleum product distributors. Since the beginning of December 2015, fuel prices are freely determined. This event presents many constraints affecting the balance of the sector plus the competition between its economic players. The lack of accompanying measures by the State makes this vital reform for public finances that stop subsidizing the price of gasoline vulnerable. With the halt of the competitive manufacturing's activity, Morocco's only refinery, distributors must, for their part, build up large stocks. As all fuel products are imported, we will be interested in the evolution by making forecasts of the price of fuels in the Moroccan market. In order to achieve their objectives, the oil companies must rely on precise forecasts. In this context, our paper aims mainly to study the time series of diesel and gasoline in order to provide precise forecasts to the company and to respect the permissible error margin of 3%. To this end, we worked with the FBPROPHET method. We found that the FBPROPHET method gives forecasts of the price of gasoline near the margin to be met for the first quarter of the current year with an average error margin of 2,855%. In addition, the assumption that the residuals are a Gaussian white noise has always been verified.

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**1 Introduction**

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

The main purpose of this LLD 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 Architecture**

PYTHON

SQL SERVER

Data (CSV)

EDA

DATA PREPROCESSING

IMPORT PYTHON LIBRARIES & READ DATA

FEATURE SELECTION

FITTING MODEL WITH FBPROPHET

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 HEROKU

CREATING POWER BI REPORT

INPUT VALUE & PREDICT FINAL RESULT

ARCHITECTURE

**2. Architecture Design**

This project is to make associate interface for the user to grasp their approximate Petrol Price Forecasting worth, additionally to the present, it would like of obtaining the important time project expertise we have a tendency to square measure mercantilism the gathered information into our own information then begin the project from the scratch.

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**2.1. Data Gathering**

The data for the current project is being gathered from Kaggle dataset, the link to the data is:

https://www.kaggle.com/c/petrol-price-forecasting/data?select=test\_data.csv

**2.2. Tool 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 version

management.

• Heroku is employed for deployment

* SQL SERVER IS USED FOR DATABASE.
* Power Bi is used for creating a report.

**2.3 Data Description**

There are about 1000 record of petrol price information with date and Petrol price column..

HLD

**2.4 Import Data into Database**

* Created associate api for the transfer of the info into the SQL SERVER info, steps performed are:
* Connection is created with the info.
* Created a info with name petrol\_price.
* Create command is written for making the info table with needed parameters.
* And finally, a insert command is written for uploading the knowledgeset into data table by bulk insertion.

**2.5 Export Data into Database**

In the above created api, the download url is also being created, which downloads the data into a csv

file format.

**2.6 Data Preprocessing**

Steps performed in pre-processing are:

* First the info sorts square measure being checked and located solely the value column is of sort number.
* Checked for null values as there square measure few null values, those rows square measure born.
* Converted all the desired column into the date time format.
* Performed one-hot cryptography for the desired columns.
* Scaling is performed for needed information.
* And, the info is prepared for passing to the machine learning formula

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**2.7 Modelling**

The pre-processed information is then envisioned and everywhere the specified insights are being drawn. Though from the drawn insights, the info is at random unfold however still modelling is performed with completely different machine learning algorithms to form positive we tend to cowl all the chances and eventually, for sure random forest regression performed well and any hyperparameter calibration is finished to extend the model’s accuracy.

**2.8 UI Integration**

Both CSS and HTML files are being created and are being integrated with the created machine learning model. All the required files are then integrated to the app.py file and tested locally

**2.3 Data from User**

The data from the user is retrieved from the created HTML web page.

**2.4 Data Validation**

The data provided by the user is then being processed by app.py file and validated. The validated data is then sent for the prediction.

**2.11 Rendering Result**

The data sent for the prediction is then rendered to the web page. And predicted result will be added in new table and export to sql server and the powerbi report is created through making connection of sql server with powerbi.

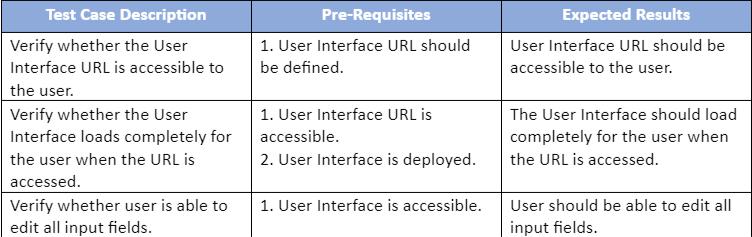
**3. Deployment**

The tested model is then deployed to Heroku. So, users can access the project from any internet devices.

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**3.1 Unit Test**



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