High Level Design (HLD)

Restaurant Rating Prediction

Revision Number:
Last date of revision:

Document Version Control

DATE ISSUED	VERSION	DESCRIPTION	AUTHORS
19-06-2023	1	Initial HLD-V1.0	**Abhishek Nagpal**

Contents

Abstract

The basic idea of analyzing the Zomato dataset is to get a fair idea about the factors affecting the establishment of different types of restaurant at different places in Bengaluru, aggregate rating of each restaurant, Bengaluru being one such city has more than 12,000 restaurants with restaurants serving dishes from all over the world. With each day new restaurants opening the industry has'nt been saturated yet and the demand is increasing day by day. Inspite of increasing demand it however has become difficult for new restaurants to compete with established restaurants. Most of them serving the same food. Bengaluru being an IT capital of India. Most of the people here are dependent mainly on the restaurant food as they don't have time to cook for themselves. With such an overwhelming demand of restaurants it has therefore become important to study the demography of a location. What kind of a food is more popular in a locality. Do the entire locality loves vegetarian food. If yes then is that locality populated by a particular sect of people for eg. Jain, Marwaris, Gujaratis who are mostly vegetarian. These kind of analysis can be done using the data, by studying the factors such as

Location of the restaurant
Approx Price of food
Theme based restaurant or not
Which locality of that city serves that cuisines with maximum number of restaurants
The needs of people who are striving to get the best cuisine of the neighborhood
Is a particular neighborhood famous for its own kind of food.

1 Introduction

1.1 Why this High-Level Design Document?

The purpose of this High Level Design (HLD) Document is to add the necessary details to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions prior to coding, and can be used as reference manual for how the modules interact at a high level.

The HLD will

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design feature and the architecture of the project
- List and describe the non-functional attribute like:

- Security
- Reliability
- Maintainability
- Portability
- Reusability
- Application compatibility
- Resource utilization
- Serviceability

1.2 Scope

The HLD document presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technical terms which should be understandable to the administrators of the system.

1.3 Definitions

RRP– Restaurant Rating Prediction

2 General Description

2.1 Product Perspective

The Restaurant Rating Prediction solution system is a data science-based machine learning model which help us to detect the rating for people .

2.2 Problem Statement

The main goal of this project is to perform extensive Exploratory Data Analysis(EDA) on the Zomato Dataset and build an appropriate Machine Learning Model that will help various Zomato Restaurants to predict their Respective Ratings based on certain features.

2.3 Proposed Solution

The solution proposed here is a data science model based on machine learning can be implemented to perform above mention use cases.

The basic idea of analyzing the Zomato dataset is to get a fair idea about the factors affecting the establishment of different types of restaurant at different places in Bengaluru, aggregate rating of each restaurant, Bengaluru being one such city has more than 12,000 restaurants with restaurants serving dishes from all over the world. With each day new restaurants opening the industry has'nt been saturated yet and the dema is increasing day by day. Inspite of increasing demand it however has become difficult for new restaurants to compete with established restaurants

2.4 Further Improvements

The main goal of this project is to perform extensive Exploratory Data Analysis(EDA) on the Zomato Dataset and build an appropriate Machine Learning Model that will help various Zomato Restaurants to predict their respective Ratings based on certain features.

2.5 Data Requirements

The basic idea of analyzing the Zomato dataset is to get a fair idea about the factors affecting the establishment of different types of restaurant at different places in Bengaluru, aggregate rating of each restaurant, Bengaluru being one such city has more than 12,000 restaurants with restaurants serving dishes from all over the world. With each day new restaurants opening the industry has'nt been saturated yet and the demand is increasing day by day. Inspite of increasing demand it however has become difficult for new restaurants to compete with established restaurants. Most of them serving the same food. Bengaluru being an IT capital of India. Most of the people here are dependent mainly on the restaurant food as they don't have time to cook for themselves. With such an overwhelming demand of restaurants it has therefore become important to study the demography of a location. What kind of a food is more popular in a locality. Do the entire locality loves vegetarian food. If yes then is that locality populated by a particular sect of people for eg. Jain, Marwaris, Gujaratis who are mostly vegetarian.

2.6 Tools used

Python programming language and frameworks such as NumPy, Pandas, Scikit-learn, Matplotlib, Plotly, Flask etc are used to build the whole model.

- Pycharm is used as IDE.

- Visual Studio Code is also used as IDE.
- For visualization of the plots, Matplotlib, Seaborn and Plotly are used.
- Render is used for deployment of the model.
- MongoDB is used for DataBase operations.
- Python, Flask is used for backend development.

2.7 Constraints

The Restaurant Rating Prediction solution system must be correct enough that it not mislead any restro rating and as automated as possible and users should not be required to know any of the workings.

2.8 Assumptions

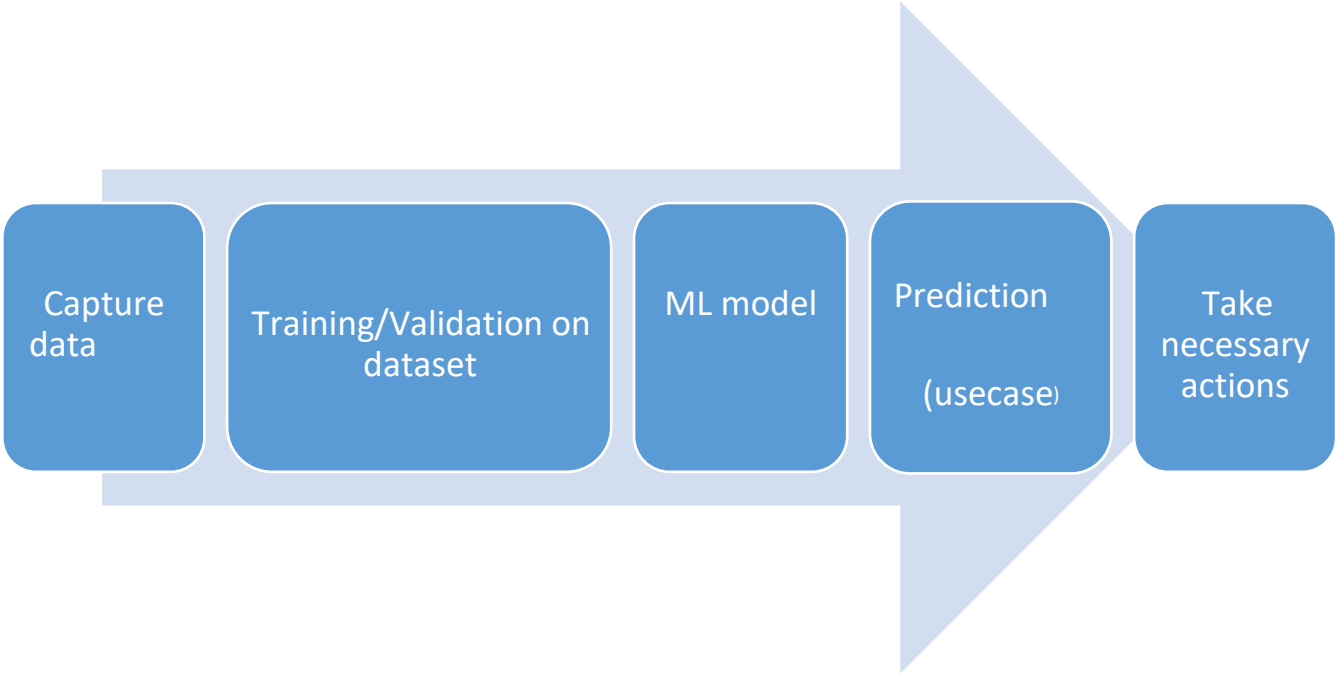
The main goal of this project is to perform extensive Exploratory Data Analysis(EDA) on the Zomato Dataset and build an appropriate Machine Learning Model that will help various Zomato Restaurants to predict their respective Ratings based on certain features.

3 Design Details

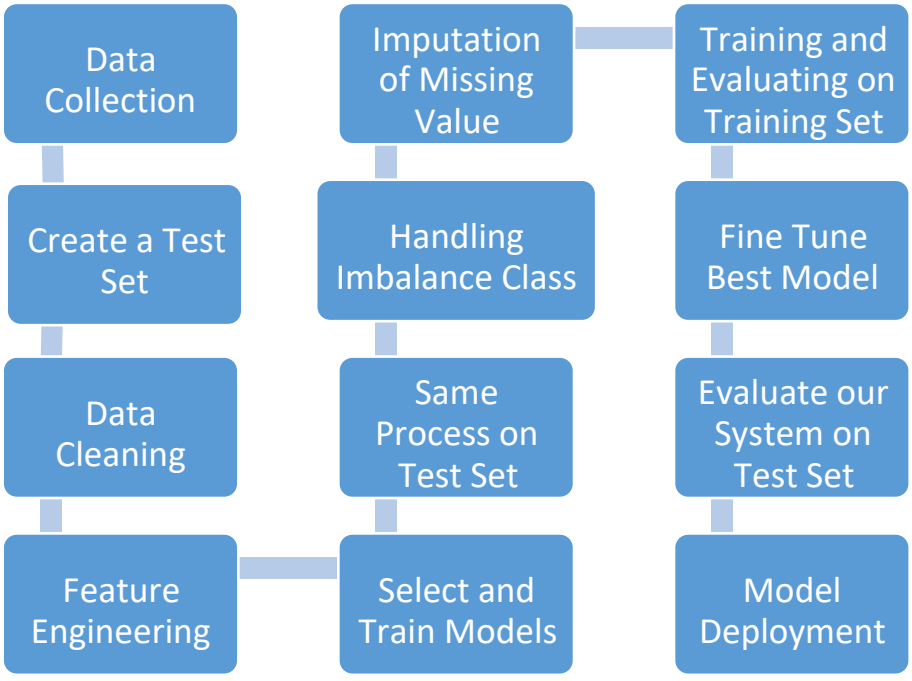
3.1 Process Flow

For detecting insurance premium, we will use machine learning base model. Below is the process flow diagram is as shown below

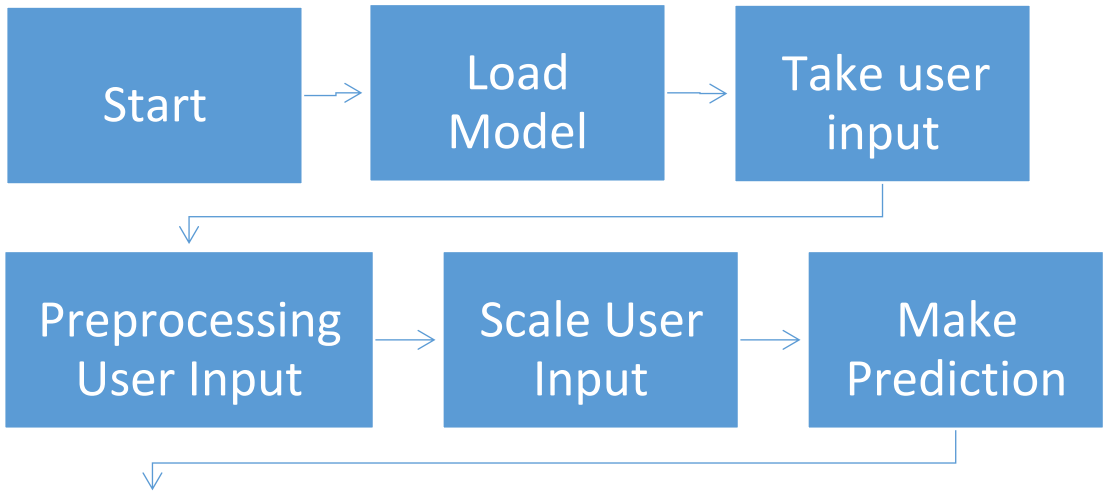
Proposed methodology



3.1.1 Model Training and Evaluation



3.1.2 Deployment Process



Result

2.6 Event log

The system should log every event so that the user will know what process is running internally.

Initial Step-By-Step Description:

1. The System identifies at what step logging required.
2. The System should be able to log each and every system flow.
3. Developer can choose logging method. You can choose database logging/ File logging s well.
4. System should not hang even after using so many loggings. Logging just because we can easily debug issues so logging is mandatory to do.

2.7 Error Handling

Should errors be encountered, an explanation will be displayed as to what went wrong? An error will be defined as anything that falls outside the normal and intended usage.

4 Performance

The machine learning based Restaurant Rating Prediction solution will used for detection of Restaurant Rating for people. So that necessary action will be taken ASP. Also model retraining is very important to improve performance.

4.1 Reusability

The code written and the components used should have the ability to be reused with no problems.

4.2 Application Compatibility

The different components for this project will be using python as an interface between them. Each component will have its own task to perform, and it is the job of the Python to ensure proper transfer of information.

4.3 Resource utilization

When any task is performed, it will likely use all the processing power available until that function is finished.

4.4 Deployment

5 Conclusion

Restaurant Rating Prediction solution will help the Restro owners as well as the customers have a better quality in the food to have and can have good time and experience

6 References

KAGGLE

https://www.kaggle.com/account/login?titleType=dataset-downloads&showDatasetDownloadSkip=False&messageId=datasetsWelcome&returnUrl=%2Fhimanshupoddar%2Fzomato-bangalore-restaurants%3Fresource%3Ddownload