Low Level Design (LLD)

Store Sales Prediction

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| Document Version | Initial LLD -V1.0 |
| Last Revised Date | 13-12-2021 |

**Document Control**

**Change Record:**

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| **Version** | **Date** | **Author** | **Comments** |
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1. Introduction

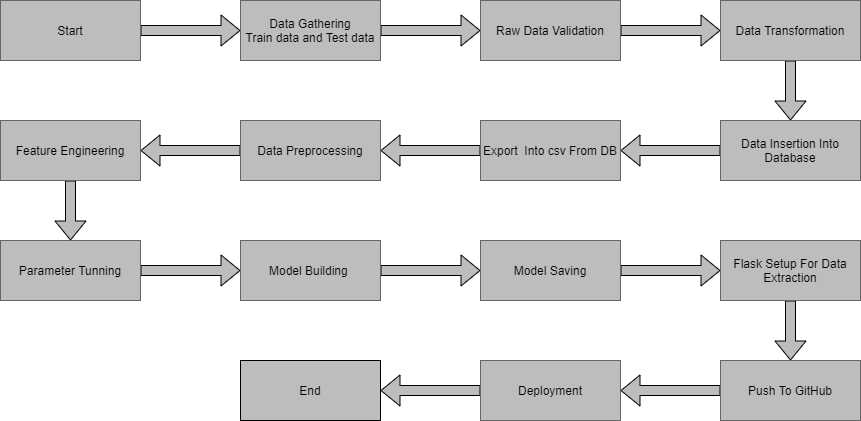
1.1. What is Low-Level design document?

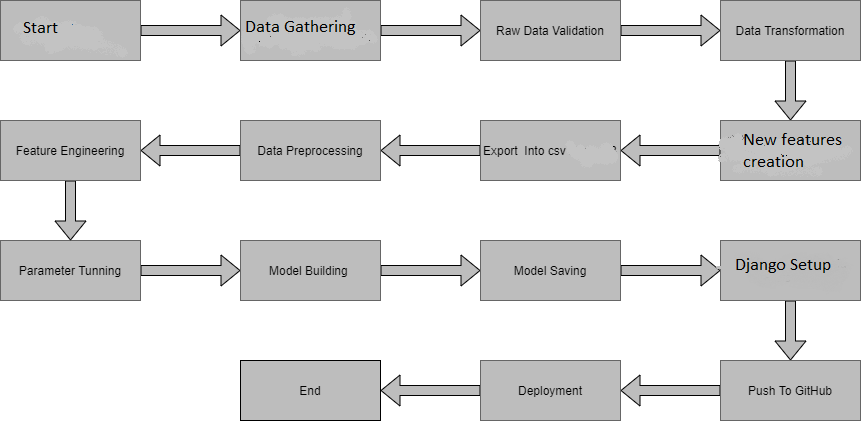
The goal of LLD or a low-level design document (LLDD) is to give the internal logical design of the actual program code for Food Recommendation System. LLD describes the class diagrams with the methods and relations between classes and program specs. It describes the modules so that the programmer can directly code the program from the document.

1.2. Scope

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. This process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

2. Architecture





3. Architecture Description

3.1. Data Description

[BigMart Sales Data](https://www.kaggle.com/brijbhushannanda1979/bigmart-sales-data) is the biggest publicly available recipe dataset. We have train (8523) and test (5681) data set, train data set has both input and output variable(s). We need to predict the sales for test data set.

3.2. Data Pre-processing

In data preprocessing all the processes required before sending the data for model building are performed. Like, here the ‘Item Visibility’ attributes are having some values equal to 0, which is not appropriate because if an item is present in the market, then how its visibility can be 0. So, it has been replaced with the average value of the item visibility of the respective ‘Item Identifier’ category. New attributes were added named ‘’Outlet years”, where the given establishment year is subtracted from the current year. A new “Item Type” attribute was added which just takes the first two characters of the Item Identifier which indicates the types of the items. Then mapping of “Fat content” is done based on ‘Low’, ‘Reg’ and ‘Non-edible’.

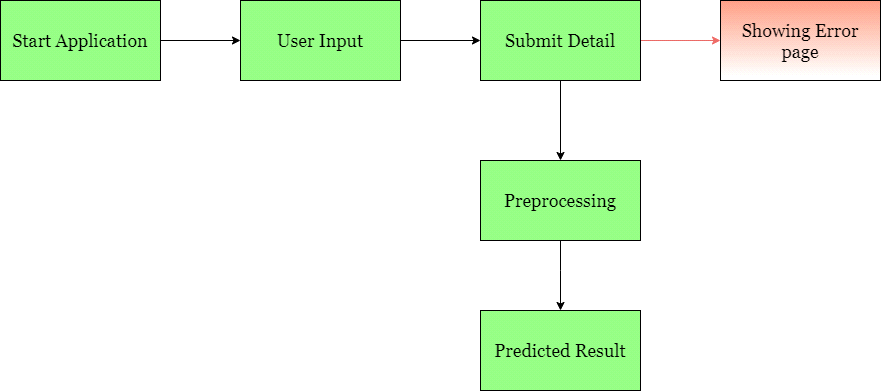
3.3. Model Building

After doing all kinds of preprocessing operations mention above and performing scaling and hyperparameter tuning, the data set is passed into all four models, Linear Regression, Gradient boost, Random Forest, and XGBoost regressor. It was found that Gradient boost performs best with the smallest RMSE value i.e. 587.0 and the highest R2 score equals 0.55. So ‘Gradient boost’ performed well in this problem.

3.4. Deployment

I will be deploying the model using flask on Heroku

User Input / Output Workflow.



4. Unit Test Cases

|  |  |  |
| --- | --- | --- |
| Test Case Description | Pre-Requisite | Expected Result |
| Verify whether the Application URL is  accessible to the user | 1. Application URL  should be defined | Application URL should be  accessible to the user |
| Verify whether the Application loads  completely for the user when the URL  is accessed | 1. Application URL  is accessible  2. Application is  deployed | The Application should load  completely for the user when the  URL is accessed |
| Verify whether user is able to see input  fields | 1. Application is  accessible | User should be able to see input  fields |
| Verify whether user gets Submit  button to submit the inputs | 1. Application is  accessible | User should get Submit button to  submit the inputs |
| Verify whether the recommended  results are in accordance to the  selections user made | 1. Application is  accessible | The recommended results should  be in accordance to the selections  user made |