**Retail Churn Analysis – Prediction**

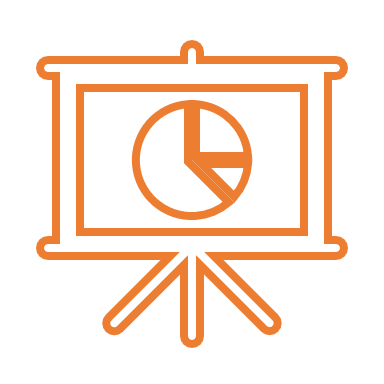
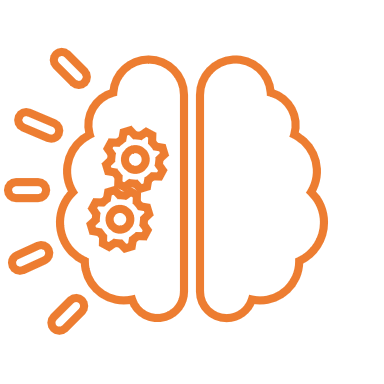
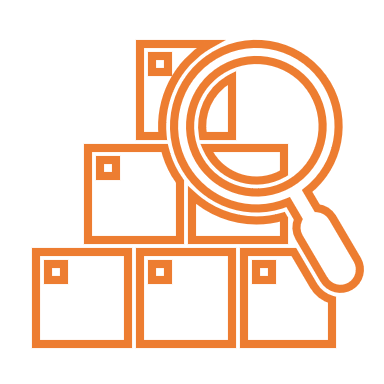
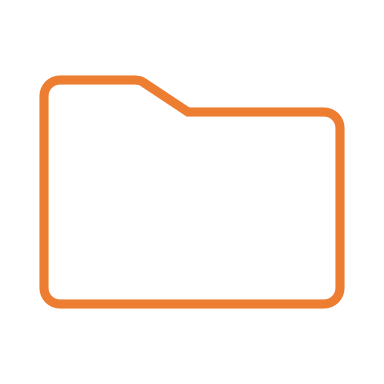
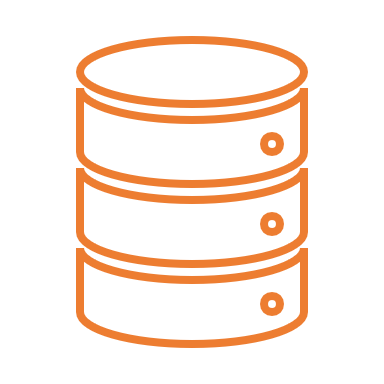
Problem Statement –

Design a web UI based end to end scalable solution to predict the loss of customer (Churn) based on the purchasing activity of a customer using Machine Learning technique.

Objectives –

* Analysis the customer purchasing habits and find some patterns
* Predict the customer is churner or not
* Build an end-to-end scalable web UI based solution

Solution –



Historical Data

Storage Local

Machine Learning

Input data from user

Webservice & BI dashboard

Data Analytics

Data Labelling

Feature Engineering

Feature Selection

Steps Involved –

Model Training –

1. Fetch the historical data from database and store it on local storage.
2. Historical data has two tables *Use Data* & *Activity Data.*
3. *User Data* & *Activity data* has following table 1 & 2.
4. Label each user of historical data as churner & non churner based on user defined parameters *churn period* & *churn threshold*.
5. Create useful features by analysing the customer purchase habits and patterns.
   1. Sum & Standard deviation of Quantity purchased per user
   2. Sum & Standard deviation of Complete Transaction (Value) per user
   3. No. of Distinct user per age-group, gender, user type, location, product category
   4. No. of Distinct Transaction, Item per user
6. Selecting best features based on statistical mutual information score.
7. Train multiple ML models (Logistic Regression, Decision Tree, Random Forest, Gradient Boosted Trees, Artificial Neural Network) and select best ML model based on defined metrics as *accuracy score, precsion-recall score, auc-roc score.*
8. Hyper tune the best selected model using *Randomised Search Cross Validation* technique.
9. Save the best trained model in local storage.

Deployment –

1. Create a web UI using *streamlit.*
   1. Page1: Retail-Churn-Prediction.
   2. Page2: Retail-Churn-Analysis.
2. Operations in Page1:
   1. Load the saved model inside web UI
   2. Accept the *user data* & *activity data* from as per the schema given in table 1 & 2 in page1
   3. Predict the user is churner or non-churner for the data uploaded by user in web UI page1
   4. Display the churn result in the web UI
3. Operations in Page2: Display the analysis of the customer purchase habits and patterns on

|  |  |
| --- | --- |
| **Fields** | **Data Type** |
| UserId | String |
| AgeGroup | String |
| Address | String |
| Gender | String |
| User Type | String |

*Table1: Schema of User Data*

|  |  |
| --- | --- |
| **Fields** | **Data Type** |
| UserId | String |
| TransactionId | String |
| TransactionDate | DateTime |
| ItemId | String |
| Quantity | Integer |
| Value | Integer |
| Location | String |
| ProductCategory | String |

*Table2: Schema of Activity Data*

View of data on database –

View of user data –