Project Amazon Sales Data Analysis

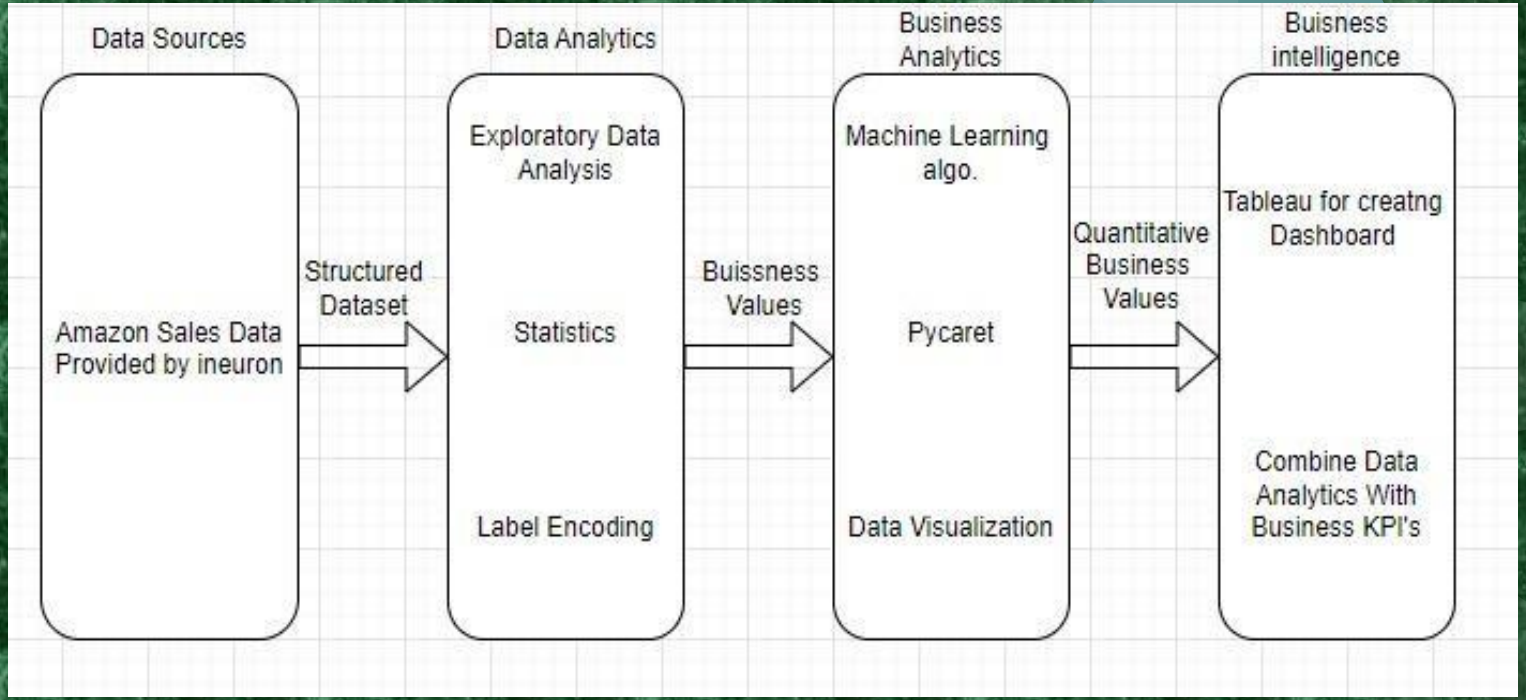
Objective

- Development of a predictive model for predicting sales.
- Perform ETL (Extract-Transform-Load) on dataset.
- Develop dashboard by using tableau.

Benefits

- Better understand and optimise revenue generation in future
- Maximize forecasting accuracy
- Make current sales experience our top priority

Architecture



Data Preprocessing:

- Importing necessary libraries for data analysis such as : Pandas, Numpy, Matplotlib & Seaborn etc.
- Using pd.read_csv() function stores the data in pandas dataframe named data.
- Using data.column showing columns present in dataframe.
- info() function show basic information of dataframe like null value count of each column and their data type
- Changing the data type of different column for model training and analysis
- Using describe function on dataframe for getting basic stats of numerical dataset
- Adding extra column to dataframe which contain only month, year and month with year
- Using isnull().sum() checking out total null value in all the column of dataframe

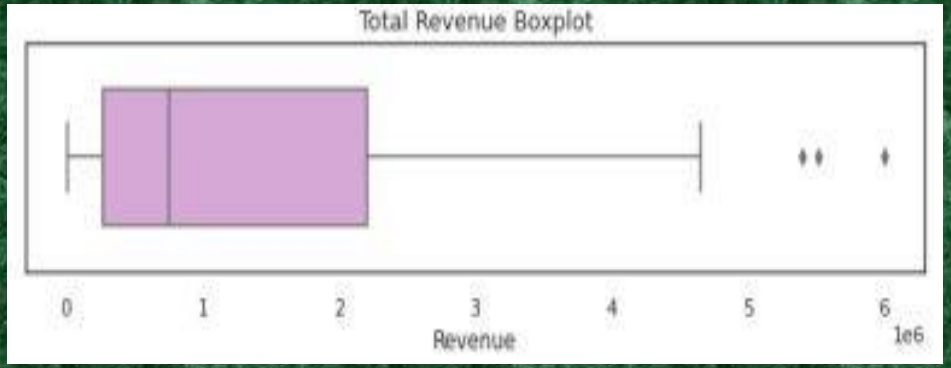
Exploratory data Analysis

Checking Outliers in the dataframe by using Box Plot

- Box Plot for Total Profit : Here we detect outliers in the specified column using the Z-score method and found 7 outliers.

- Box Plot of Total Cost : found 5 outliers in Total Cost column

- Box Plot of Total Revenue : Found 6 outliers in Total Revenue column



- Creating a bar chart for Total Revenue and Order Month : where it showcases the number of order purchased in particular month.

- Calculating the total revenue for each group with respect to Item Type and then sorting then in descending order.
- Calculating the total profit for each group with respect to Item Type and then sorting them in descending order.

- Calculating correlation of 'Total Revenue', 'Total Cost' and 'Total Profit' columns present in dataframe.

```
print(df[['Total Revenue', 'Total Cost', 'Total Profit']].corr())
```

	Total Revenue	Total Cost	Total Profit
Total Revenue	1.000000	0.983928	0.897327
Total Cost	0.983928	1.000000	0.804091
Total Profit	0.897327	0.804091	1.000000

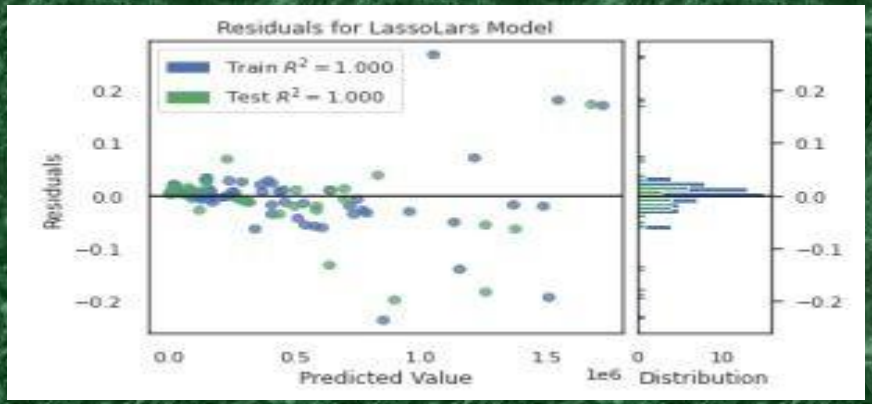
Predictive Analytics :

- Label Encoding of Item Type, Sales Channel and Order Priority for model training.
- Dropping columns Region, Country, Order Date MonthYear, Order ID and Ship Date.

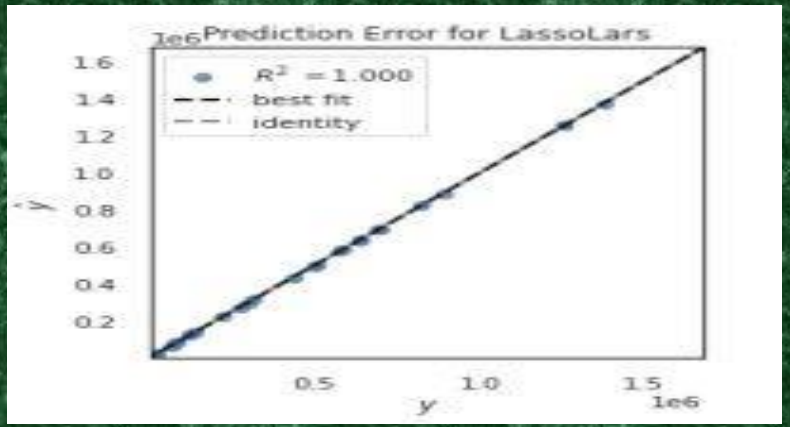
Pycaret library :

- PyCaret is an open-source, low-code machine learning library in Python.
- Allows users to quickly and easily build, compare, and deploy machine learning models on structured and tabular data.
- Reduce the amount of code needed to build a model.
- It provides preprocessing and feature engineering functions.
- Automatic model selection and hyperparameter tuning.
- Support for a wide range of machine learning algorithms

- Plotting residuals for Lasso Least Angle Regression based trained model

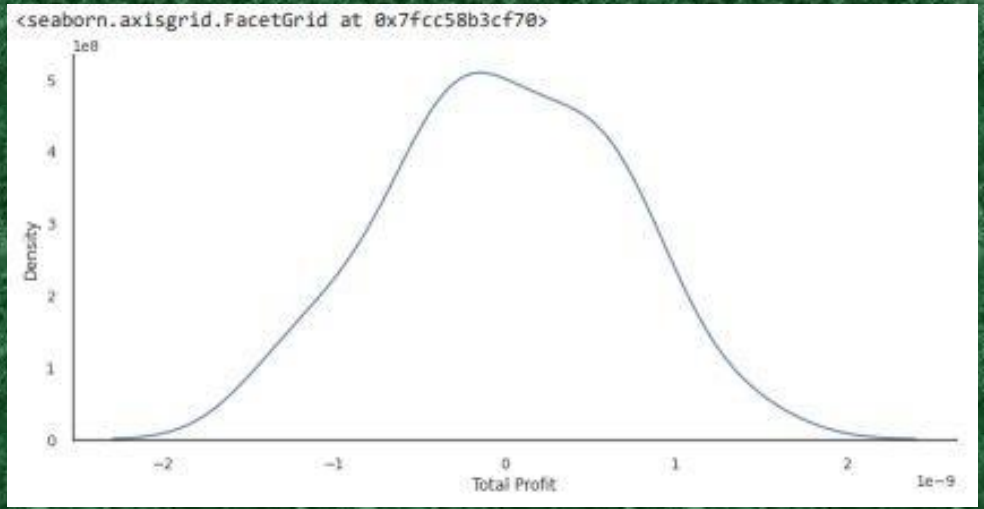


- Plotting prediction error plot for Lasso Least Angle Regression based trained model



Implementation of Lingar Regression

- Selecting the independent variables and target variable.
- Splitting the data into training and testing datasets.
- Standardizing the dataset.
- Performing fit transform on X_train dataframe.
- Performing fit transform on X_test dataframe.
- Applying Linear Regression on X_train and y_train.
- Calculating mean squared error.
- Creating kernel density estimate plot



- Plotting the predicted values against the actual values to visualize how well the model is fitting the data.