1.INTRODUCTION :-

Many organizations do not have a direct role in travel and tourism but offer related products and services. Some examples would be offering travel insurance, parking facilities at airports, theatre and event tickets, car hire, and travel by rail or coach to airports, etc. at competitive rates. There are various different forms of dynamic pricing.

1.1 Overview:-

Every day the price of travel was changed due to the demand for public uses. The framework developed for the price prediction is analyzed for the travel plans. For the same travel plan offered at a fixed price for a particular group of customers, our proposed model saw a final fare with a lesser number of errors in predicting customer planning. As time progresses and more data are collected, the supervised learning will produce more accurate results and will be helpful in determining fare optimizer and dynamic availability of adjustments and continuously improve future recommendations.

1.2 Purpose:-

- The use of this project is to Predict Dynamic increase of price of cabs using Machine Learning
- 1. Peak Pricing – This is a strategy that is common in transportation businesses. Airlines are a good example. Airlines often charge a higher price to travel during rush hour mostly on weekdays and sometimes on weekends.
- 2. Surge Pricing – Companies such as Uber respond dynamically to changes in supply and demand in order to price their services differently. Like most of us have noticed, this frequently happens on stormy evenings and nights when more people request for cabs. Taxify also not so long ago introduced dynamic pricing to ensure the drivers are encouraged to go online and offer services when the demand is high.

2 LITERATURE SURVEY :-

2.1 Existing problem:-

There are several Machine learning algorithms to be used depending on the data you are going to process such as images, sound, text, and numerical values. The algorithms that you can choose according to the objective that you might have it may be Classification algorithms are Regression algorithms.

2.2 Proposed solution:-

1. Linear Regression

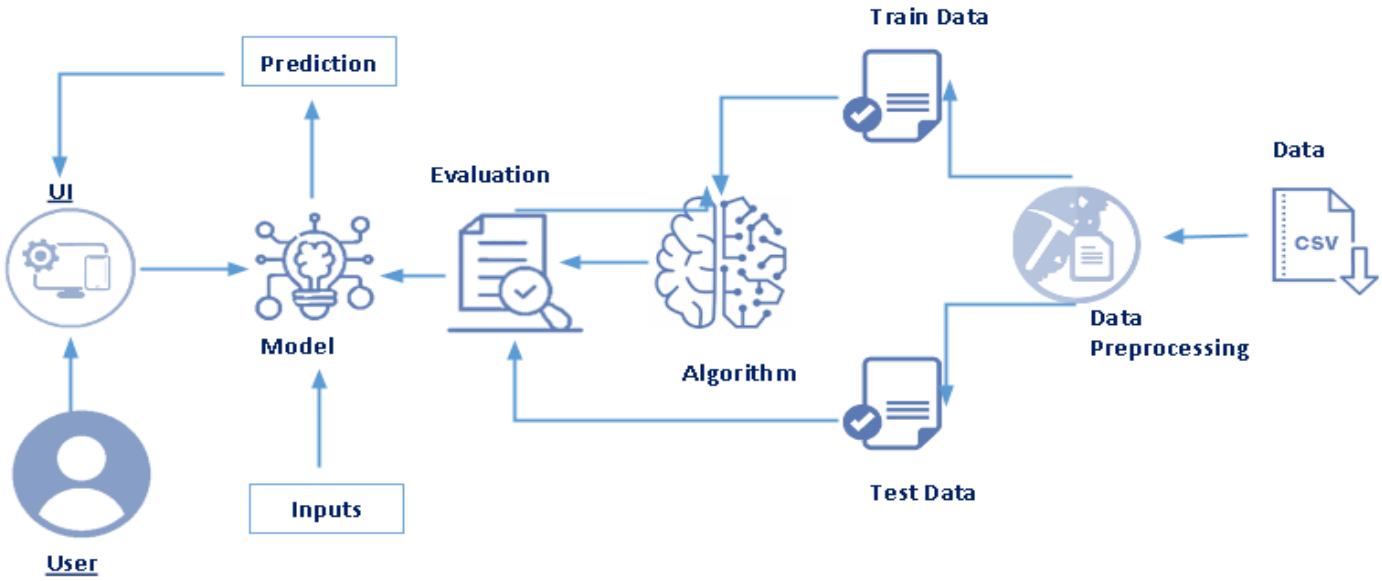
2. Logistic Regression.

- 3. Random Forest Regression / Classification.
- 4. Decision Tree Regression / Classification.

- You will need to train the datasets to run smoothly and see an incremental improvement in the prediction rate.
- Now we apply the Random forest regressor algorithm on our dataset.
- A Random Forest is an ensemble technique capable of performing both regression and classification tasks with the use of multiple decision trees and a technique called Bootstrap and Aggregation, commonly known as bagging. The basic idea behind this is to combine multiple decision trees in determining the final output rather than relying on individual decision trees.

3 THEORITICAL ANALYSIS :-

BLOCK DIAGRAM:-



- In order to develop this project we need to install following softwares/packages
- **Anaconda Navigator :**
- Anaconda Navigator is a free and open-source distribution of the Python and R programming languages for data science and machine learning related applications. It can be installed on Windows, Linux, and macOS.Conda is an open-source, cross-platform, package management system. Anaconda comes with so

very nice tools like JupyterLab, Jupyter Notebook,

- QtConsole, Spyder, Glueviz, Orange, Rstudio, Visual Studio Code. For this project, we will be using Jupyter notebook and Spyder

- To install Anaconda navigator and to know how to use Jupyter Notebook & Spyder using Anaconda watch the video.
- To make a responsive python script you must require the following packages
- **Requests:** Allows you to send HTTP requests using Python.
- **Flask:** Web framework used for building Web applications.

- If you are using anaconda navigator, follow below steps to download required packages:
- Open the anaconda prompt.
- Type "pip install requests" and click enter.
- Type "pip install Flask" and click enter.
- If you are using Pycharm IDE, you can install the packages through the command prompt and follow the same syntax as above.

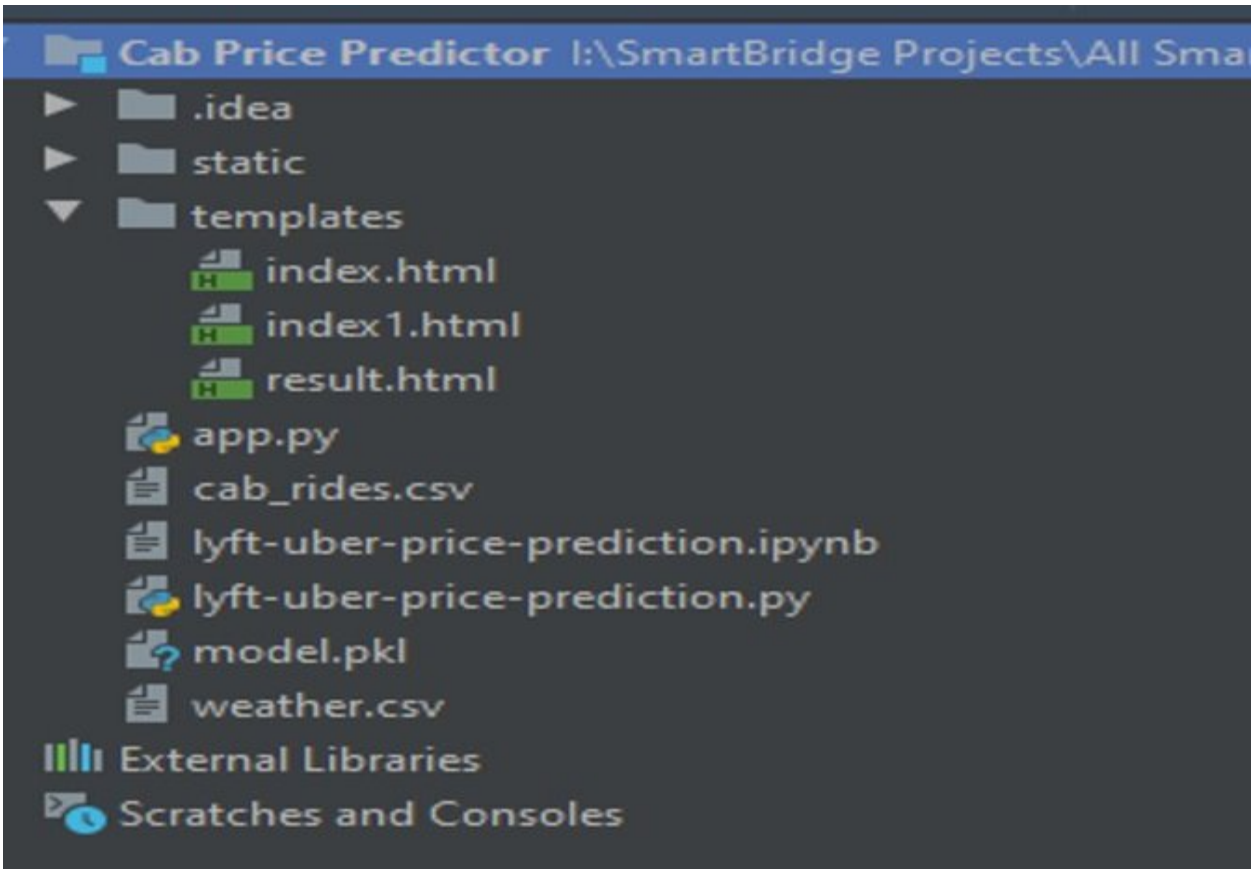
- **Prior Knowledge :** One should have knowledge on the following Concepts:
- **Requests:** Allows you to send HTTP requests using Python.
- **Flask:** Web framework used for building Web applications.

4 EXPERIMENTAL INVESTIGATIONS:-

- Sometimes you may find some data missing in the dataset. We need to be equipped to handle the problem when we come across them. Obviously you could remove the entire line of data but what if you are unknowingly removing crucial information? Of course we would not want to do that. One of the most common ideas to handle the problem is to take a mean of all the values for continuous and for categorical we make use of mode values and replace the missing data.

- Word "True" that the particular column has missing values, we can also see the count of missing values in each column by using isna().sum function.

5 FLOWCHART:-



1. Install Required Libraries.
2.
2. Data Collection.

- Collect the dataset or Create the dataset

1. Data Pre- processing.
2.

- Import the Libraries.
- Importing the dataset.
- Understanding Data Type and Summary of features.
- Take care of missing data & create columns.
- Data Visualization.
- Drop the column from dataframe ,merge the dataframes.
- Observing Target,Numerical and Categorical Columns
- Label Encoding & Splitting the Dataset into Dependent and Independent variables
- Splitting Data into Train and Test.

1. **Model Building :**

- Training and testing the model

- Evaluation of Model

- Saving the Model

1. **Application Building**
2.

- Create an HTML file

- Build a Python Code

1. **Final UI**
2.

- Dashboard Of the flask app.

6 RESULT:-

Once the model is trained, it's ready to make predictions. We can use the predict method on the model and pass x_test as a parameter to get the output as y_pred.
Notice that the prediction output is an array of real numbers corresponding to the input array.

7 ADVANTAGES & DISADVANTAGES :-

- Advantages of dynamic pricing
- Pricing automation. Businesses that implement dynamic pricing can completely or partially automate price adjustments – depending on their needs. Pricing tools evaluate a large number of internal (stock or inventory, KPIs, etc.) and external factors (competitor prices, demand, etc.) to generate prices that align with a company's pricing strategy.
- Increased competitiveness. The ability of a business to respond to current demand, rationally use its inventory or stock, or develop a brand perception through specific pricing decisions allows it to stay afloat no matter what the current market condition is. For instance, an airline can secure itself from bad sales during a low-demand season or before an upcoming departure day by putting tickets on sale.

- Customer alienation and backlash. Generally, people accept price drops and increases when booking accommodation or flights, which isn't the case for retailers and car rental companies in particular. Customers don't like to feel like they've paid more than other people for the same product or service. Such a pricing strategy can lead to bad reviews, complaints, or worse. One case for customer alienation is that when users put an item in the basket without purchasing the item and after a day or so, they'll get a discount code for the abandoned cart item, explains Kocak.

- The risk of the race to the bottom. Price transparency is one of today's market traits: Consumers can find which merchant provides an item or service of interest for a cheaper price in several clicks or taps. Competition is intense, and some businesses rashly cut prices in response to their competitors. That way, they risk losing a price war they have started. The race to the bottom is full-on when a company

deliberately charges less and decreases their profit margins.

8 APPLICATIONS :-

- Dynamic pricing is a common practice in several industries such as hospitality, tourism, entertainment, retail, electricity, and public transport. Each industry takes a slightly different approach to dynamic pricing based on its individual needs and the demand for the product.
- Snowy, rainy, rush-hour, or during the storm, riding services use dynamic pricing (surge pricing) to benefit from the environmental conditions. Airline pricing: regulars can organize their flights 5 months in advance. But business people often need to reserve flights at the last minute.

- Dynamic pricing algorithms help businesses make informed pricing decisions. It allows eCommerce companies to change prices frequently and gather real-time feedback data. As a result, the company can respond to demand changes effectively, automate price management and reduce the risk of forecasting errors

9 CONCLUSION :-

- This is the main page of Dynamic price predictor for travel .where you may know about the project and also from this page user can click onto the prediction button and they will redirect onto the

prediction page for providing the inputs.
The prediction page user gives the input for predicting the output where they can choose Cab Name ,Cab Type,Cab Service Type,Source & Destination then click to predict the output.
In the predict page user will get the output based on the inputs they given in the prediction page.

10 FUTURE SCOPE :-

- Using dynamic pricing, it is possible to track the value of one specific product more quickly, and simultaneously track competitor price fluctuations. This offers a vantage point that allows you to follow trends in order to increase your profit margin, without fearing the loss of market space.
- Dynamic pricing is when a company or store continuously adjusts its prices throughout the day. The goal of these price changes is two fold: on one hand, companies want to optimize for margins, and on the other they want to increase their chances of sales.

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