Internship project

report on

Dynamic Pricing Prediction for Cabs Using IBM Watson

SUBMITTED BY:

SRUJAN H J	4BD18CS102
SWETHA M	4BD18CS114
TEJASWINI T P	4BD18CS116
SHREYA B B	4BD18CS128

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BAPUJI INSTITUTE OF ENGINEERING AND TECHNOLOGY DAVANGERE

ACADEMIC YEAR: 2021-2022

CONTENTS

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

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:

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.

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.

1.2 PURPOSE

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.

CHAPTER 2

LITERATURE SURVEY

2.1 EXISTING SYSTEM

Car price prediction is somehow interesting and popular problem. Accurate car price prediction involves expert knowledge, because price usually depends on many distinctive features and factors. Typically, most significant ones are brand and model, age, horsepower and mileage. The fuel type used in the car as well as fuel consumption per mile highly affect price of a car due to a frequent change in the price of a fuel.

2.2 PROPOSED SYSTEM

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.

CHAPTER 3

THEORETICAL ANALYSIS

3.1 BLOCK DIAGRAM

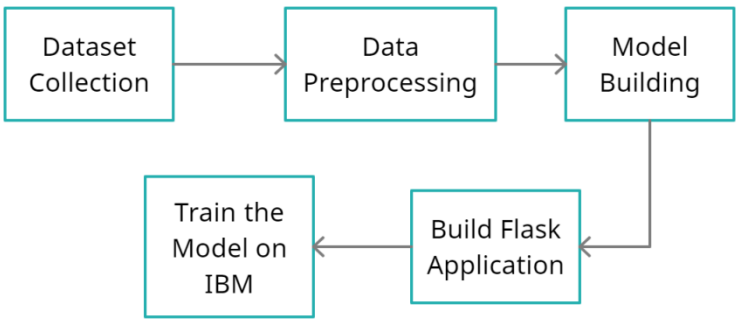

Figure 3.1.1: Block Diagram of Project

3.2 HARDWARE AND SOFTWARE DESIGNING

HARDWARE DESIGNING:

The hardware required for the development of this project is:

- Processor : Intel® CoreTM i5-9300H
- Processor speed : 2.4GHz
- RAM Size : 8 GB DDR
- System Type : X64-based processor

SOFTWARE DESIGNING:

The software required for the development of this project is:

- Desktop GUI : Anaconda Navigator
- Operating System : Windows 10(and other higher version)
- Front end : HTML,CSS,JAVASCRIPT
- Programming Language : PYTHON
- Cloud Computing Service : IBM Cloud Services

CHAPTER 4

EXPERIMENTAL ANALYSIS

4.1 ANALYSIS OR INVESTIGATION MADE WHILE WORKING

A cab price prediction has been a high-interest research area, as it requires noticeable effort and knowledge of the field expert. Considerable number of distinct attributes are examined for the reliable and accurate prediction. To build a model for predicting the price of used cars in we applied machine learning technique (Random Forest). Furthermore, the model was evaluated using test data and the accuracy of 87.38% was obtained.

Random Forest Regressor:

Random forest is a meta estimator that fits a number of classifying decision trees on various sub-samples of the dataset and uses averaging to improve the predictive accuracy and control over-fitting. The sub-sample size is controlled with the max_samples parameter if bootstrap=True (default), otherwise the whole dataset is used to build each tree.

Python Flask:

Flask is a micro web framework written in Python.Extensions exist for object-relational mappers, form validation, upload handling, various open authentication technologies and several common framework related tools. Flask is used for the backend, but it makes use of a templating language called Jinja2 which is used to create HTML, XML or other markup formats that are returned to the user via an HTTP request. Flask offers a diversified working style while Django offers a Monolithic working style. It is designed as a web framework for restful API development

CHAPTER 5

FLOWCHART

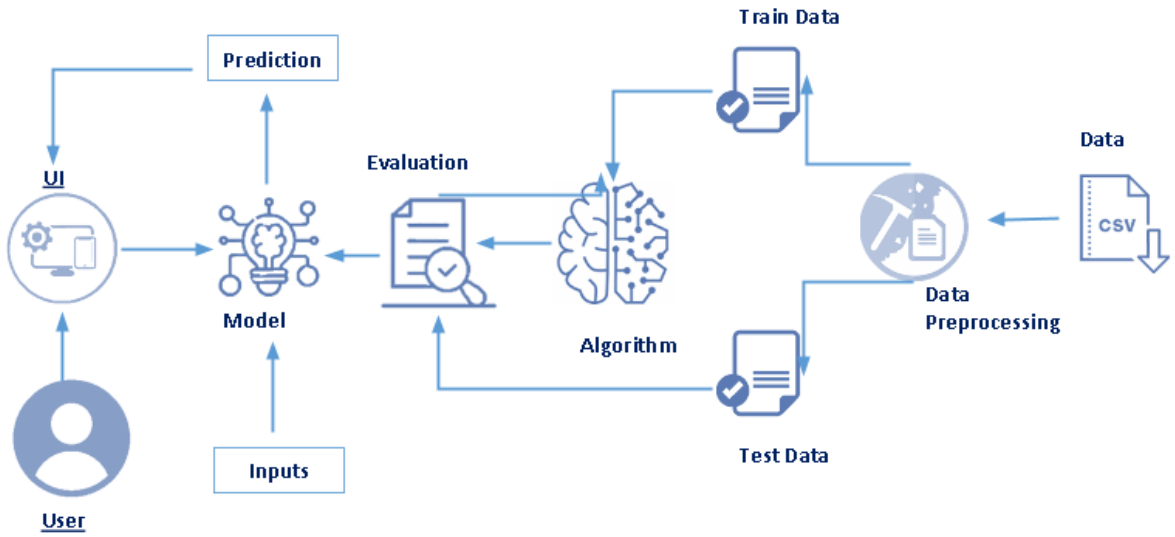

Figure 5.1: Flowchart of the Project

Project Flow:

1. Install Required Libraries.

2. Data Collection.
    - Collect the dataset or Create the dataset

3. Data Pre- processing.
    - 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.

4. Model Building
    - Training and testing the model
    - Evaluation of Model
    - Saving the Model

5. Application Building
    - Create an HTML file
    - Build a Python Code

6. Final UI
    - Dashboard Of the flask app.

CHAPTER 6

RESULT

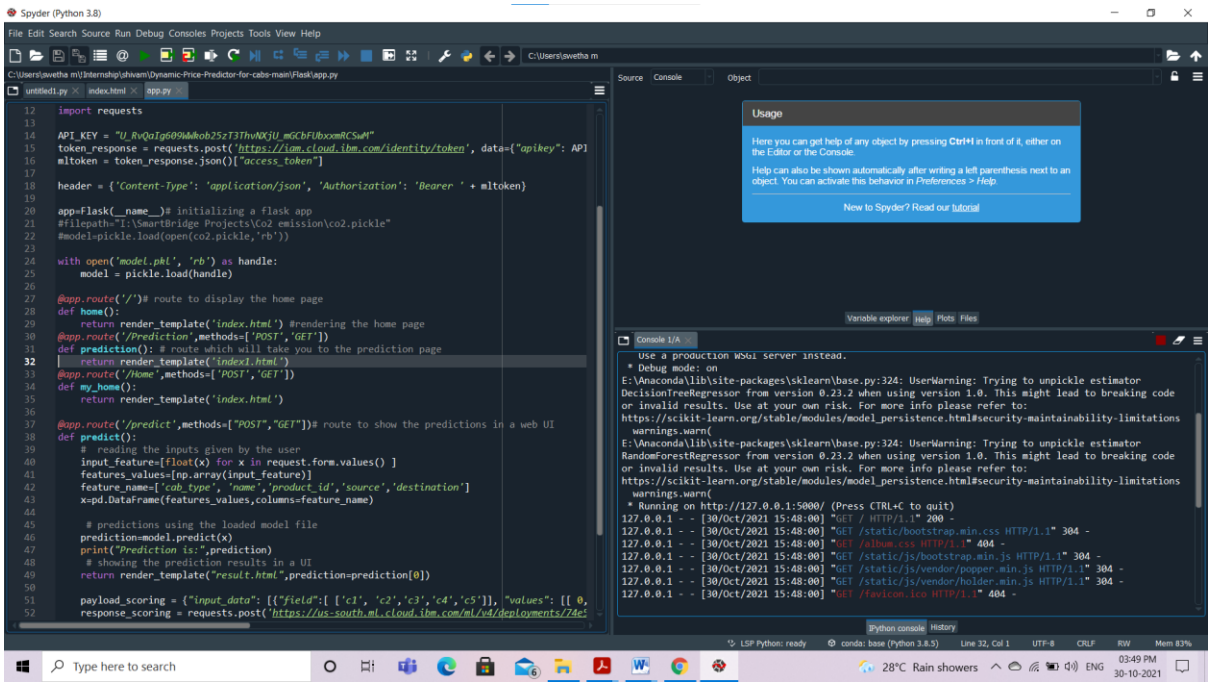

Figure 6.1: Output Page

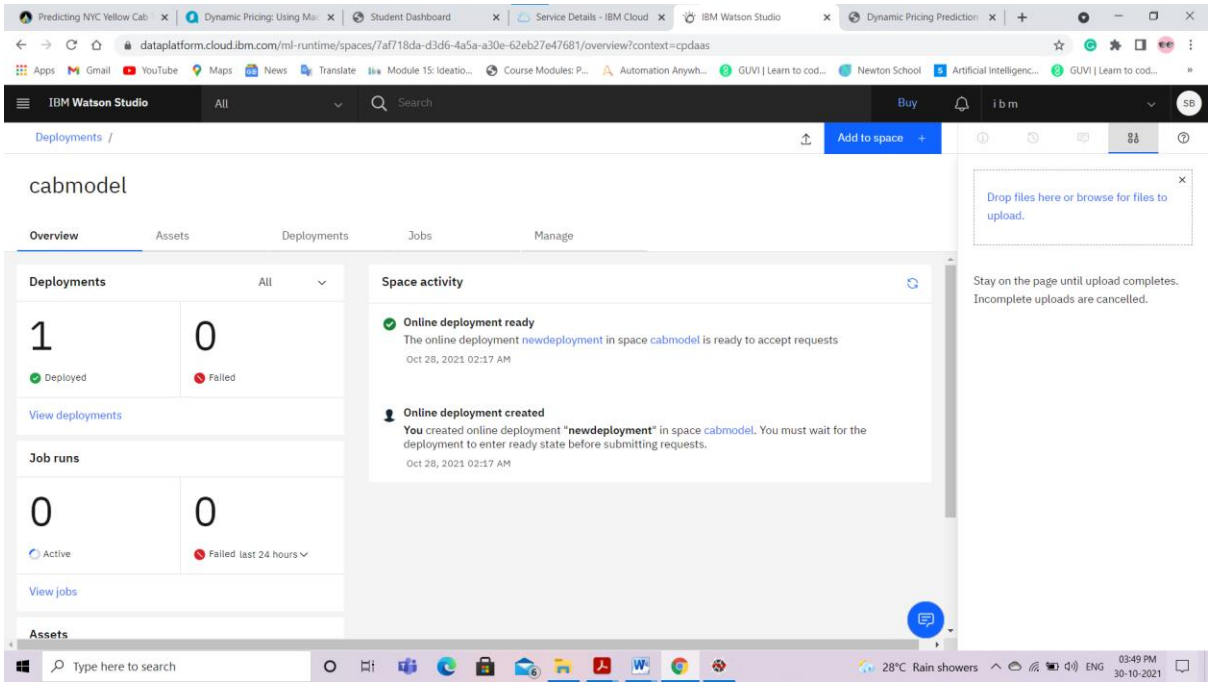

Figure 6.2: Deploying Project in IBM Cloud

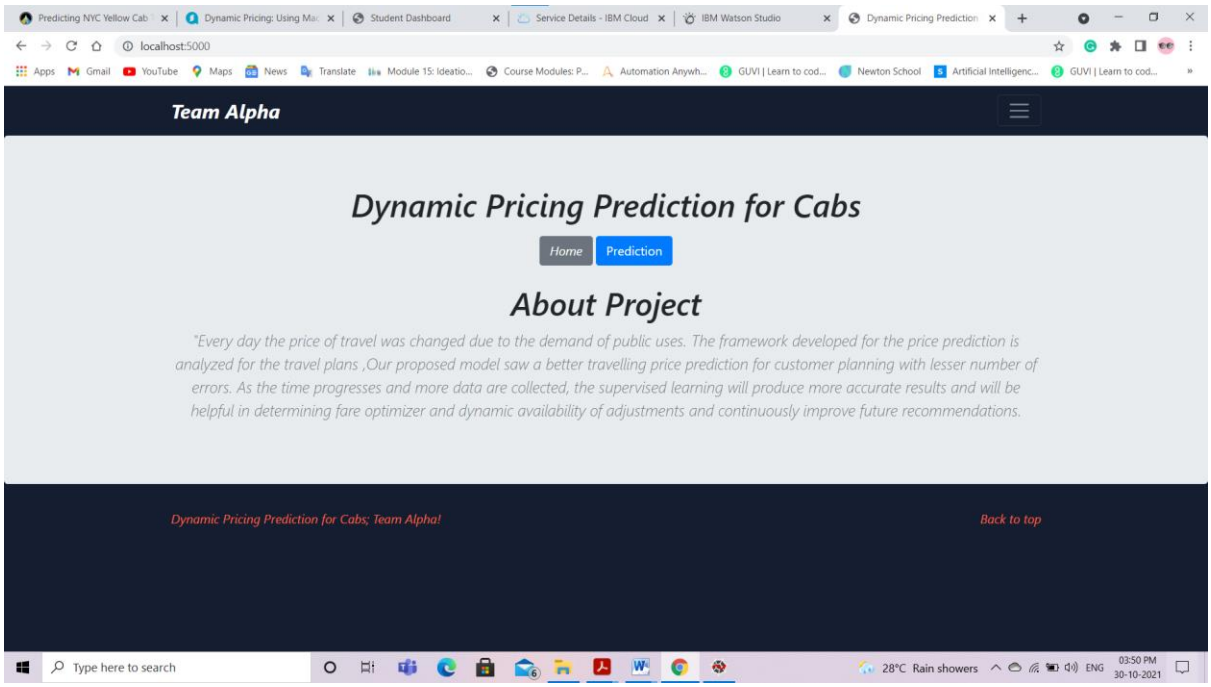

Figure 6.3: Final UI Home page

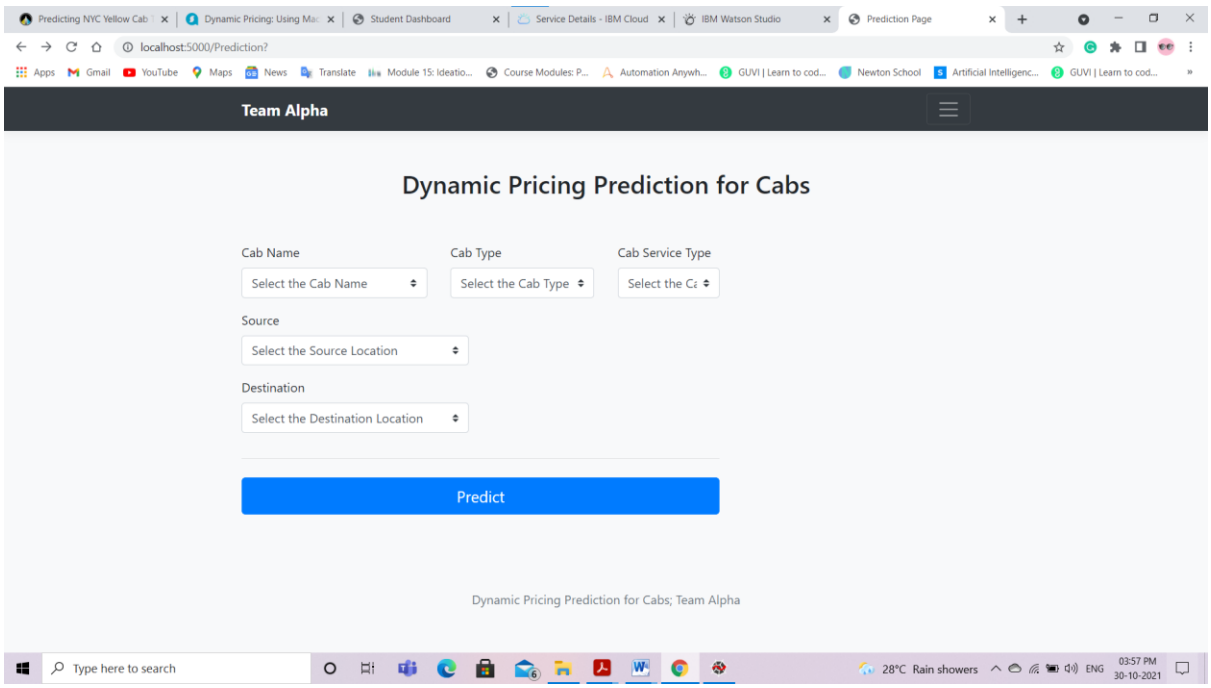

Figure 6.4: Prediction Page

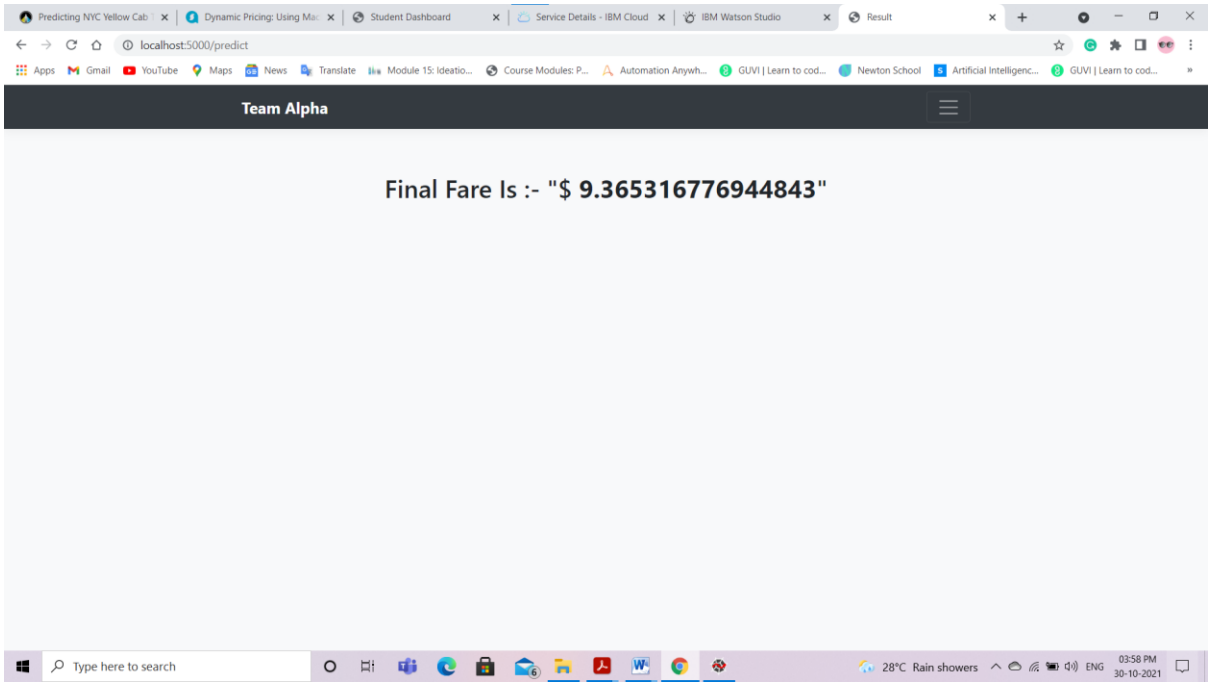

Figure 6.5: Result page

CHAPTER 7

ADVANTAGES AND DISADVANTAGES

Advantages

1. Industry can leverage artificial intelligence (AI) to attain dynamic pricing, and boost revenue per unit, average rates and utilization. AI can seamlessly factor in numerous variables–including location, seasonality, real-time demand, individual buying patterns, competitors' pricing and time of day–to match demand and supply, and uncover evolving demand patterns.
2. A dynamic pricing algorithm is 'efficient' at managing thousands of price points and at the same time granular to look at the price point on a periodic basis.

Disadvantages

1. Car price prediction can be a challenging task due to the high number of attributes that should be considered for the accurate prediction.
2. Data cleaning is one of the processes that increases prediction performance, yet insufficient for the cases of complex data sets.

CHAPTER 8

APPLICATIONS

1. Dynamic pricing adjusts rates based on a number of variables, such as time and distance of your route, traffic and the current rider-to-driver demand.
2. It helps to encourage more drivers to get on the road and help deal with number of rider requests.
3. Dynamic pricing helps us to make sure there are always enough drivers to handle ride requests, so the customer can ride quickly and easily.
4. Enables company to be aware on how the demand fluctuates.

CHAPTER 9

CONCLUSION AND FUTURESCOPE

Conclusion

Cab price prediction can be a challenging task due to the high number of attributes that should be considered for the accurate prediction. The major step in the prediction process is collection and pre-processing of the data.

The proposed system is a sequential learning model with recurrent machine learning for predicting the cab price in different areas in the city. Learning from the past historical data, the demand prediction is done for the location. Cab rides and weather data set is used to train our model. This model gives the prediction of cab price.

Future scope

This work can be extended in the future by adding more input such as holidays, festivals etc. Cabs can be organized and send based on the prediction of the model. In addition, it can save so much time and energy that is currently being spent by cabs to find passengers.