Industrial Project Report

Submitted in partial fulfillment of the degree of

B-tech in Electrical Engineering

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AFFILIATED TO

Maulana Abul Kalam Azad University of Technology

Under the supervision of :- Mr. Ripam Kundu

Sikharthy Infotech Pvt. Ltd.

PROJECT ON :- UBER DATA ANALYSIS WITH MACHINE LEARNING

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UNDER THE GUIDANCE OF

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Project Guide

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IN
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Department of Electrical Engineering

I hereby forward the documentation prepared under my supervision by **Ripam Kundu Sir** entitled **Siliguri Institute Of Technology** to be accepted as fulfillment of the requirement for the Degree of Bachelor of Technology in Electrical Engineering, **Siliguri Institute Of Technology** affiliated to **Maulana Abul Kalam Azad University of Technology** (**MAKAUT**).

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Certificate of Approval

The foregoing project is hereby approved as a creditable study for the B.Tech in Electrical Engineering presented in a manner of satisfactory to warrant its acceptance as a prerequisite to the degree for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorsed or approved any statement made, opinion expressed or conclusion therein but approve this project only for the purpose for which it is submitted.

Final Examination for
Evaluation of the Project

Signatures of Examiners

ABSTRACT

The paper explains the working of an Uber dataset, which contains data produced by Uber for Russia . Uber is defined as a P2P platform. The platform links you to drivers who can take you to your destination. The dataset includes primary data on Uber pickups with details including the date, time of the ride as well as longitude-latitude information, Using the information, the paper explains the use of the classification algorithm on the set of data and classify the various parts of Russia . Since the industry is booming and expected to grow shortly. Effective taxi dispatching will facilitate each driver and passenger to reduce the wait time to seek out one another. The model is employed to predict the demand on points of the Russia.

ACKNOWLEDGEMENT

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Finally, we express our sincere thankfulness to our family members for inspiring me all throughout and always encouraging us.

Group Mamber Signature

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INTRODUCTION

We will use Python and its different libraries to complete the uber data analysis

WHAT LIBRARIES WE USED

Importing Libraries

The analysis will be done using the following libraries :

- Pandas: This library helps to load the data frame in a 2D array format and has multiple functions to perform analysis tasks in one go.
- NumPy: NumPy arrays are very fast and can perform large computations in a very short time.
- Matplotlib / Seaborn: This library is used to draw visualizations.
- Plotly: Plotly is a free and open-source graphing library for Python.
- Matplot3D : The mplot3d toolkit adds simple 3D plotting capabilities to matplotlib by supplying an axes object that can create a 2D projection of a 3D scene

To importing all these libraries, we can use the below code :

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.graph_objects as go
from  mpl_toolkits.mplot3D import Axes3D
```

Importing Dataset

After importing all the libraries , you can import the dataset using the pandas library.

```
dataset = pd.read_csv("uber_dataset.csv")
dataset.head()
```

So after importing the datasets the output we get is : -

	trip_completed_at	trip_status	ride_hailing_app	trip_uid	driver_uid	rider_uid	ct
0	May 11, 2015 at 6:55PM	Completed	Uber	ee89076fd9da9bddf5f096b0ca42f8d5	05cfeb269e606247fe9d2b6082942c59	3ffa4a71a5aa791a8bc3409f5b15b936	
1	May 11, 2015 at 8:12PM	Completed	Uber	518be51d403944a03c47e8d1f2c87311	4a4e248742f9d5ff517c5bbbb48d0e54	3ffa4a71a5aa791a8bc3409f5b15b936	
2	May 13, 2015 at 11:38AM	Completed	Uber	6e460cc8a12c3c6568d0d4a67ac58393	cb249a2bd807ca78697b4ed0348c37da	3ffa4a71a5aa791a8bc3409f5b15b936	
3	May 16, 2015 at 1:44AM	Completed	Uber	49613a86a04e6c15d72b51d1a2935d81	d3f73f8151c2e8c34b541f961db7f5fa	3ffa4a71a5aa791a8bc3409f5b15b936	
4	May 16, 2015 at 3:18AM	Completed	Uber	9896148fdecdb4c5d977a8691510bdb6	1287d21e6455ee40d4861f6b91c680f4	3ffa4a71a5aa791a8bc3409f5b15b936	

5 rows × 45 columns

DATA CLEANING :-

Data cleaning is the process of preparing data for analysis by removing or modifying data that is incorrect, incomplete, irrelevant, duplicated, or improperly formatted.

```
dataset[dataset['surge_multiplier'].isnull()].head(5)
```

	trip_completed_at	trip_status	ride_hailing_app	trip_uid	driver_uid	rider_uid	ct
20	June 12, 2015 at 6:01PM	Completed	Gett	c9df3a9edb2c7b37c80f9ffa5e1b8c36	151944a8f9967b3edad02deb712d61f2	3ffa4a71a5aa791a8bc3409f5b15b936	
135	March 5, 2016 at 4:35PM	Completed	Gett	19564cbd0929d51297a5fce739a5c777	524f217db5cb84a0c343cb7f05f40f52	3ffa4a71a5aa791a8bc3409f5b15b936	
137	March 17, 2016 at 12:57PM	Completed	Gett	2f7ca9c163bb40c5e5b49771e9290 75a	af6d53a1a051b89037613fa74b0a2039	3ffa4a71a5aa791a8bc3409f5b15b936	
142	April 3, 2016 at 3:15PM	Completed	Gett	b603f7e2fbda958c778a8e236b369b34	b700e12aef6fe616f4132b5b10735f26	3ffa4a71a5aa791a8bc3409f5b15b936	
199	July 29, 2016 at 3:35PM	Completed	Gett	1e4023aecad6062b038656b9bec5b433	e75db42065bc8e071d2b57c0c9977376	3ffa4a71a5aa791a8bc3409f5b15b936	

5 rows × 45 columns

DATA PROFILING:-

Data profiling is a technique used to analyse and gain a better understanding of raw data. It is the first step in determining what insights data can yield when you run it through machine learning algorithms in order to make predictions. Through data profiling, you determine whether the dataset is complete and accurate enough to solve a practical business problem. It is the very first step in preparing your data for predictive analytics, and it is essential for clarifying the structure, content (features), and relationships of your dataset for predictive modeling.

In the Data Profiling section , we were able to take out the output of the trip start address .

DATA PREPROCESSING :-

Data pre-processing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model.

When creating a machine learning project, it is not always a case that we come across the clean and formatted data. And while doing any operation with data, it is mandatory to clean it and put in a formatted way. So for this, we use data pre-processing task.

DATA VISUALISATION :-

Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data. Additionally, it provides an excellent way for employees or business owners to present data to non-technical audiences without confusion.

In the world of Big Data, data visualization tools and technologies are essential to analyze massive amounts of information and make data-driven decisions.

INPUT :-

```
obj = (dataset.dtypes == 'object')
object_cols = list(obj[obj].index)

unique_values = {}
for col in object_cols:
  unique_values[col] = dataset[col].unique().size
unique_values
```

Output :-

```
{'trip_completed_at': 643,
 'trip_status': 2,
 'ride_hailing_app': 2,
 'trip_uid': 643,
 'driver_uid': 593,
 'rider_uid': 1,
 'customer': 1,
 'trip_start_time': 642,
 'trip_end_time': 642,
 'trip_time': 548,
 'total_time': 78,
 'wait_time': 451,
 'trip_type': 6,
 'vehicle_make_model': 119,
 'vehicle_license_plate': 1,
 'driver_name_en': 174,
 'vehicle_make': 36,
 'vehicle_model': 117,
 'driver_gender': 2,
 'driver_photo_url': 1,
 'driver_phone_number': 1,
 'trip_map_image_url': 1,
 'trip_path_image_url': 1,
 'city': 3,
 'country': 1,
 'trip_start_address': 287,
 'trip_end_address': 250,
 'price_rub': 390,
 'temperature_time': 642,
 'cloudness': 99,
 'weather_main': 9,
 'weather_desc': 13,
 'precipitation': 3}
```

DATA VISUALISATION USING PLOTTING :-

INPUT :-

Make a plot for 👇

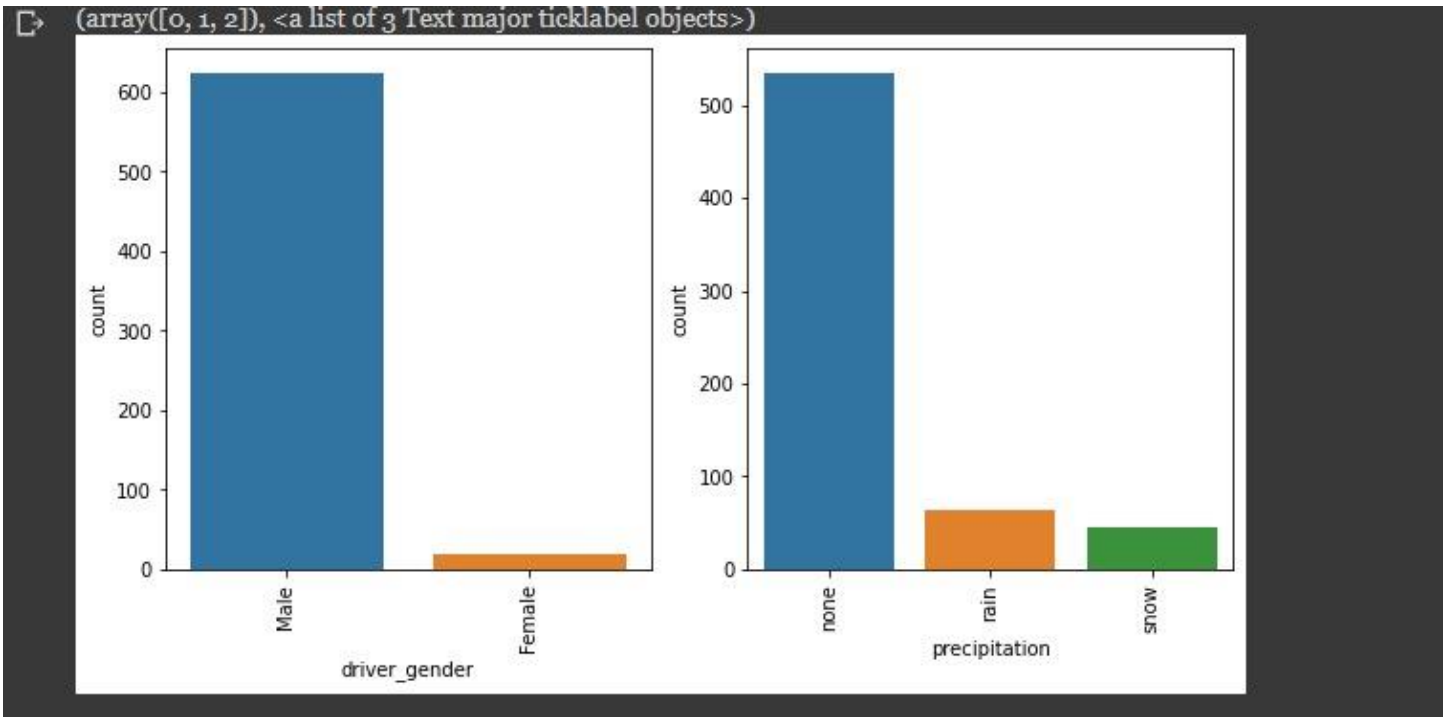
driver_gender vs precipitation

```
[26] plt.figure(figsize=(10,5))

     plt.subplot(1,2,1)
     sns.countplot(dataset['driver_gender'])
     plt.xticks(rotation=90)

     plt.subplot(1,2,2)
     sns.countplot(dataset['precipitation'])
     plt.xticks(rotation=90)
```

Output :-



DATE TIME OPERATION :-

By converting the strings into datetimes, this exposes all the pandas dt properties.

DATE TIME OPERATION

```
[49]  dataset['trip_start_time'] = pd.to_datetime(dataset['trip_start_time'],
                errors='coerce')
      dataset['trip_end_time'] = pd.to_datetime(dataset['trip_end_time'],
                errors='coerce')
```

```
[58]  from datetime import datetime

      dataset['date'] = pd.DatetimeIndex(dataset['trip_start_time']).date
      dataset['time'] = pd.DatetimeIndex(dataset['trip_start_time']).hour

      #changing into categories of day and night
      dataset['day-night'] = pd.cut(x=dataset['time'],
            bins = [0,10,15,19,24],
            labels = ['Morning','Afternoon','Evening','Night'])
```

FUNCTIONAL REQUIREMENTS OF THE SYSTEM

SOFTWARE:

- *Operating System*
- Windows OS 11

WEB BROWSER:

- Internet Explorer 7
- Google Chrome

CODING LANGUAGE :

- Python

Conclusion :

Working with different kinds of data poses a unique challenge each time. Issues might crop up in the data values stemming from the data collection stage or the data storing/retrieval stage. One such challenge for the Uber dataset is that many location columns have NULL values or say “Unknown Location.” When fewer in number, you can delete these rows. But in our case, “Unknown Location” has a high occurrence in the location columns but does not give us any knowledge or insight about the user’s travel patterns. But due to their significance, those rows cannot be ignored unless the rest of the features of those rows are proven to be equally useless.

REFERENCE

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www.geeksforgeesks.com

www.3Dsurfaceplot.com