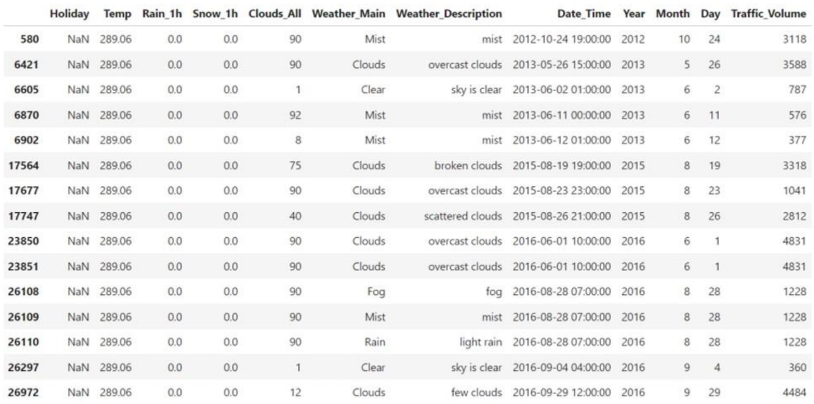
Data Collection and Preprocessing Phase

Date	12 July 2024
Team ID	SWTID1720527361
Project Title	Traffictelligence-Advanced-Traffic-Volume Estimation-With-Machine-Learning
Maximum Marks	6 Marks

Data Exploration and Preprocessing Template

Identifies data sources, assesses quality issues like missing values and duplicates, and implements resolution plans to ensure accurate and reliable analysis.

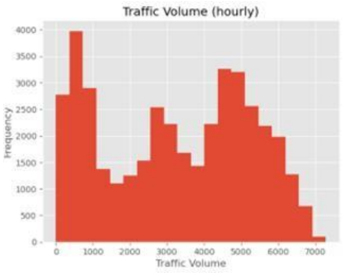
Section	**Description**
Data Overview	Dimension:- 40632 rows*12 columns

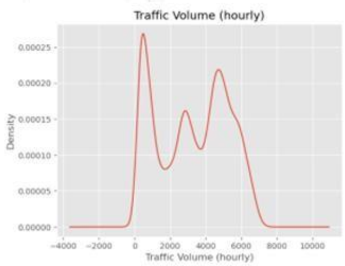


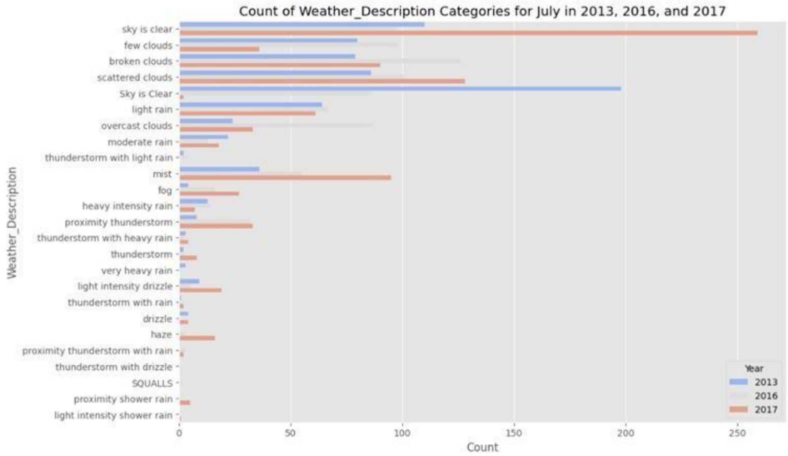
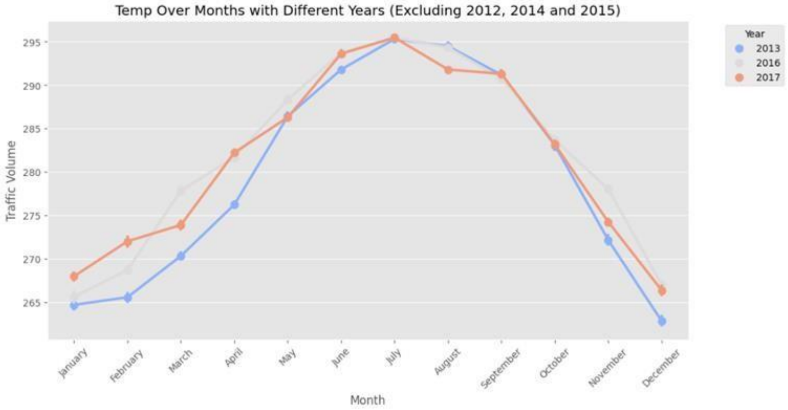
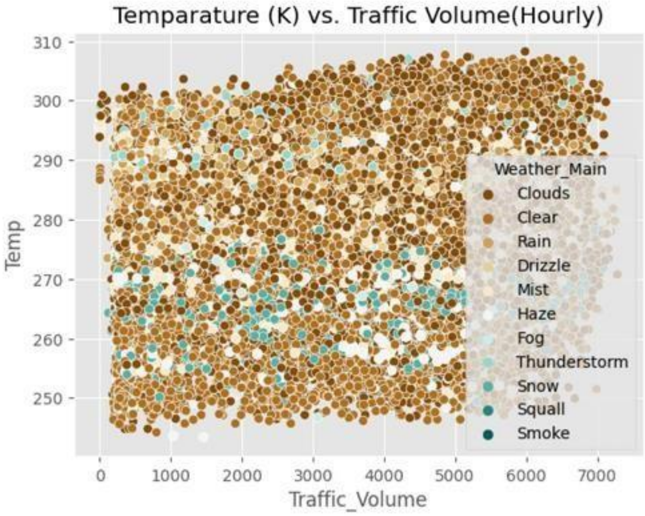
	Holiday	Temp	Rain_1h	Snow_1h	Clouds_All	Weather_Main	Weather_Description	Date_Time	Year	Month	Day	Traffic_Volume
580	NaN	289.06	0.0	0.0	90	Mist	mist	2012-10-24 19:00:00	2012	10	24	3118
6421	NaN	289.06	0.0	0.0	90	Clouds	overcast clouds	2013-05-26 15:00:00	2013	5	26	3588
6605	NaN	289.06	0.0	0.0	1	Clear	sky is clear	2013-06-02 01:00:00	2013	6	2	787
6870	NaN	289.06	0.0	0.0	92	Mist	mist	2013-06-11 00:00:00	2013	6	11	576
6902	NaN	289.06	0.0	0.0	8	Mist	mist	2013-06-12 01:00:00	2013	6	12	377
17564	NaN	289.06	0.0	0.0	75	Clouds	broken clouds	2015-08-19 19:00:00	2015	8	19	3318
17677	NaN	289.06	0.0	0.0	90	Clouds	overcast clouds	2015-08-23 23:00:00	2015	8	23	1041
17747	NaN	289.06	0.0	0.0	40	Clouds	scattered clouds	2015-08-26 21:00:00	2015	8	26	2812
23850	NaN	289.06	0.0	0.0	90	Clouds	overcast clouds	2016-06-01 10:00:00	2016	6	1	4831
23851	NaN	289.06	0.0	0.0	90	Clouds	overcast clouds	2016-06-01 10:00:00	2016	6	1	4831
26108	NaN	289.06	0.0	0.0	90	Fog	fog	2016-08-28 07:00:00	2016	8	28	1228
26109	NaN	289.06	0.0	0.0	90	Mist	mist	2016-08-28 07:00:00	2016	8	28	1228
26110	NaN	289.06	0.0	0.0	90	Rain	light rain	2016-08-28 07:00:00	2016	8	28	1228
26297	NaN	289.06	0.0	0.0	1	Clear	sky is clear	2016-09-04 04:00:00	2016	9	4	360
26972	NaN	289.06	0.0	0.0	12	Clouds	few clouds	2016-09-29 12:00:00	2016	9	29	4484

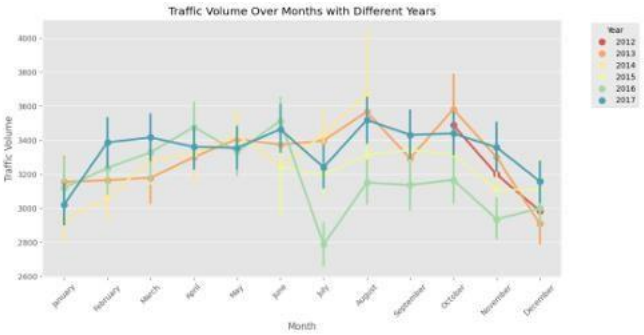
Descriptive Statistics:-

Univariate Analysis



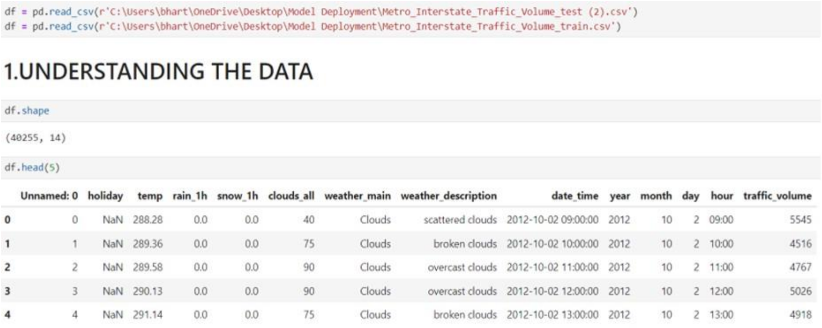


Bivariate Analysis	 
Multivariate Analysis	

	
Outliers and Anomalies	extreme weather, special events, accidents, data errors, or unusual traffic patterns

Data Preprocessing Code Screenshots

Loading Data



```
df = pd.read_csv(r'C:\Users\bhart\OneDrive\Desktop\Model Deployment\Metro_Interstate_Traffic_Volume_test (2).csv')
df = pd.read_csv(r'C:\Users\bhart\OneDrive\Desktop\Model Deployment\Metro_Interstate_Traffic_Volume_train.csv')
```

1.UNDERSTANDING THE DATA

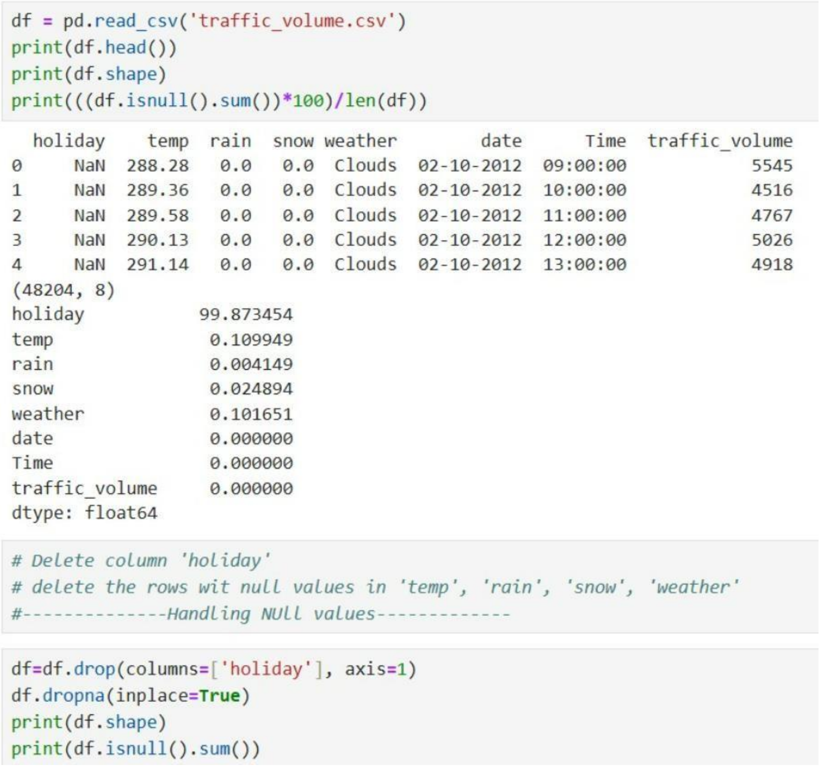
```
df.shape
```

```
(40255, 14)
```

```
df.head(5)
```

	Unnamed: 0	holiday	temp	rain_1h	snow_1h	clouds_all	weather_main	weather_description	date_time	year	month	day	hour	traffic_volume
0	0	NaN	288.28	0.0	0.0	40	Clouds	scattered clouds	2012-10-02 09:00:00	2012	10	2	09:00	5545
1	1	NaN	289.36	0.0	0.0	75	Clouds	broken clouds	2012-10-02 10:00:00	2012	10	2	10:00	4516
2	2	NaN	289.58	0.0	0.0	90	Clouds	overcast clouds	2012-10-02 11:00:00	2012	10	2	11:00	4767
3	3	NaN	290.13	0.0	0.0	90	Clouds	overcast clouds	2012-10-02 12:00:00	2012	10	2	12:00	5026
4	4	NaN	291.14	0.0	0.0	75	Clouds	broken clouds	2012-10-02 13:00:00	2012	10	2	13:00	4918

<table>
<tr>
<td>Handling Missing Data</td>
<td>



```
df = pd.read_csv('traffic_volume.csv')
print(df.head())
print(df.shape)
print(((df.isnull().sum())*100)/len(df))
```

```
  holiday    temp  rain  snow weather        date      Time  traffic_volume
0     NaN  288.28   0.0   0.0  Clouds  02-10-2012  09:00:00            5545
1     NaN  289.36   0.0   0.0  Clouds  02-10-2012  10:00:00            4516
2     NaN  289.58   0.0   0.0  Clouds  02-10-2012  11:00:00            4767
3     NaN  290.13   0.0   0.0  Clouds  02-10-2012  12:00:00            5026
4     NaN  291.14   0.0   0.0  Clouds  02-10-2012  13:00:00            4918
(48204, 8)
holiday           99.873454
temp               0.109949
rain               0.004149
snow               0.024894
weather            0.101651
date               0.000000
Time               0.000000
traffic_volume     0.000000
dtype: float64
```

```
# Delete column 'holiday'
# delete the rows wit null values in 'temp', 'rain', 'snow', 'weather'
#-------------Handling NULL values-------------
```

```
df=df.drop(columns=['holiday'], axis=1)
df.dropna(inplace=True)
print(df.shape)
print(df.isnull().sum())
```

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<tr>
<td>Data Transformation</td>
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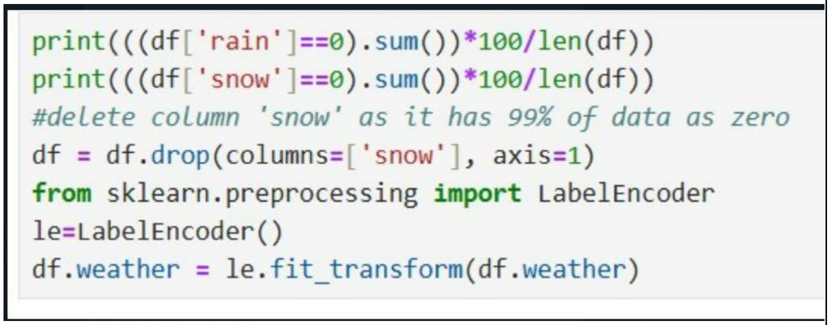

```
print(((df['rain']==0).sum())*100/len(df))
print(((df['snow']==0).sum())*100/len(df))
#delete column 'snow' as it has 99% of data as zero
df = df.drop(columns=['snow'], axis=1)
from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()
df.weather = le.fit_transform(df.weather)
```

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<td>Feature Engineering</td>
<td>Attached the codes in final Submission</td>
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<td>Save Processed Data</td>
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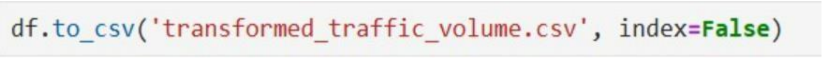

```
df.to_csv('transformed_traffic_volume.csv', index=False)
```

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