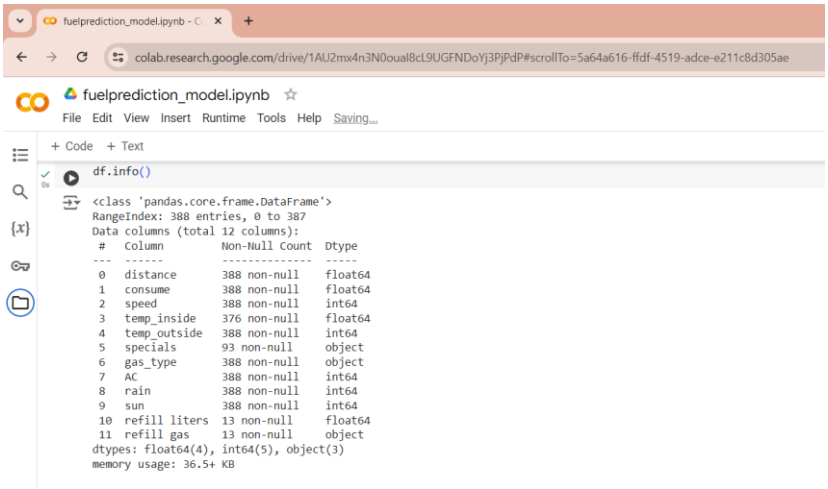
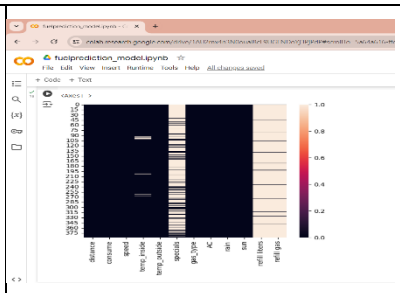
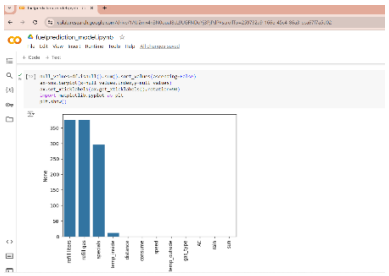
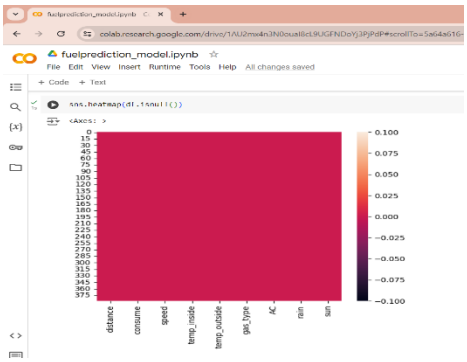
Data Collection and Preprocessing Phase

Date	9 July 2024
Team ID	740064
Project Title	Trip-Based Modelling of Fuel Consumption in Modern Fleet Vehicles Using 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	388 rows x 12 columns, dtypes: float64(4),int64(5),object(3) 
Univariate Analysis	Exploration of individual of accuracy_score,mean_squared_error,r2_score,mean_absolute_error
Bivariate Analysis	Relationships between two variables (correlation, scatter plots) .

	 
Multivariate Analysis	
Outliers and Anomalies and null values	We do not have any outliers and analomalies in our dataset except that we have null values so we have handle the null values and drop them in the way as follows 
Data Preprocessing Code Screenshots	

Loading Data	`[7] df = pd.read_csv('measurements.csv')`
	`print(df.head())`
	
	`distance consume speed temp_inside temp_outside specials gas_type AC \`
	`0 28.0 5.0 26 21.5 12 NaN E10 0`
	`1 12.0 4.2 30 21.5 13 NaN E10 0`
	`2 11.2 5.5 38 21.5 15 NaN E10 0`
	`3 12.9 3.9 36 21.5 14 NaN E10 0`
	`4 18.5 4.5 46 21.5 15 NaN E10 0`
	
	`rain sun refill liters refill gas`
	`0 0 0 45.0 E10`
	`1 0 0 NaN NaN`
	`2 0 0 NaN NaN`
	`3 0 0 NaN NaN`
	`4 0 0 NaN NaN`

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

```
df.isnull()
```

	distance	consume	speed	temp_inside	temp_outside	specials	gas_type	AC	rain	sun	refill liters	refill gas
0	False	False	False	False	False	True	False	False	False	False	False	False
1	False	False	False	False	False	True	False	False	False	False	True	True
2	False	False	False	False	False	True	False	False	False	False	True	True
3	False	False	False	False	False	True	False	False	False	False	True	True
4	False	False	False	False	False	True	False	False	False	False	True	True
...	...	...	...	...	...	...	...	...	...	...	...	...
383	False	False	False	False	False	True	False	False	False	False	True	True
384	False	False	False	False	False	False	False	False	False	False	True	True
385	False	False	False	False	False	True	False	False	False	False	True	True
386	False	False	False	False	False	False	False	False	False	False	True	True
387	False	False	False	False	False	False	False	False	False	False	True	True

388 rows × 12 columns
</td></tr>
<tr><td>Data Transformation</td><td>Splitting the data ：

```
[24] x=x.values
     y=y.values
```

```
#Splitting Data Into Train And Test
```

+ Code

```
[26] x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.3,random_state=42)
```
</td></tr>
<tr><td>Feature Engineering</td><td>modifying existing ones

```
[20] #seperating independent and dependent variables
```

```
[21] from sklearn.model_selection import train_test_split
     from sklearn.linear_model import LinearRegression
```

```
[22] x=df.drop(['consume','gas_type'],axis=1)
     y=df['consume']
```

```
[23] x.columns
```

```
Index(['distance', 'speed', 'temp_inside', 'temp_outside', 'AC', 'rain',
       'sun'],
      dtype='object')
```

```
[24] x=x.values
     y=y.values
```
</td></tr>
<tr><td>Save Processed Data</td><td>Code to save the cleaned and processed data for future use.

```
import pickle
pickle.dump(dt,open('fuel2.pkl','wb'))
```
</td></tr>
</table>