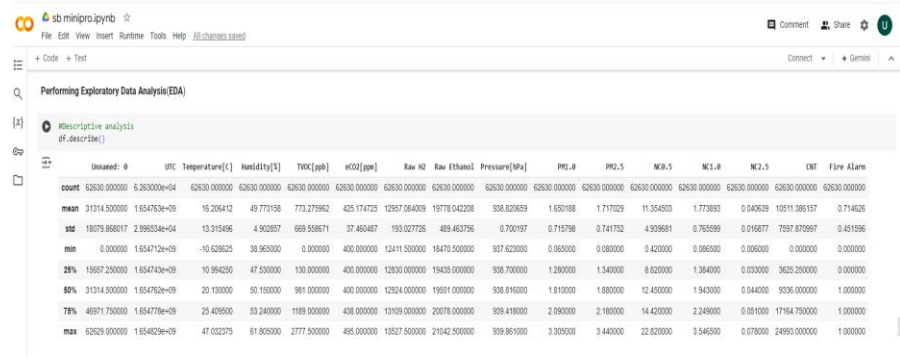


Data Collection and Preprocessing Phase

Date	11-07-2024
Team ID	739955
Project Title	SMOKE DETECTION USING IOT DATASET
Maximum Marks	6 Marks

Data Exploration and Preprocessing Report

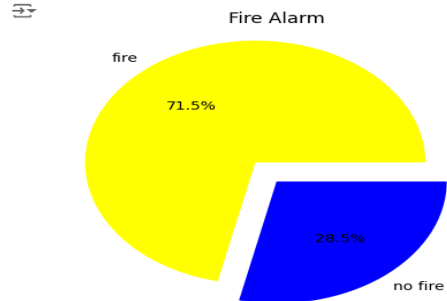
Dataset variables will be statistically analyzed to identify patterns and outliers, with Python employed for preprocessing tasks like normalization and feature engineering. Data cleaning will address missing values and outliers, ensuring quality for subsequent analysis and modeling, and forming a strong foundation for insights and predictions.

Section	Description
Data Overview	<p><u>Dimension:</u> 614 rows × 13 columns</p> <p><u>Descriptive statistics:</u></p> 
Univariate Analysis	

```
sb minipro.ipynb
File Edit View Insert Runtime Tools Help Last saved at 11:42 AM

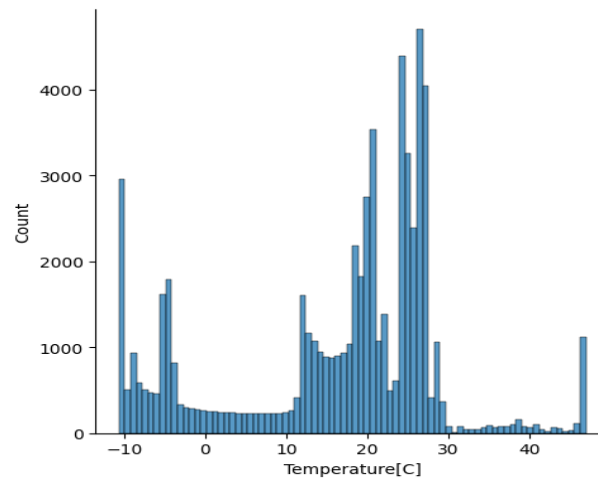
+ Code + Text

#Visualizing data
#Univariate analysis
plt.pie(df['Fire Alarm'].value_counts(),[0.2,0],labels=['fire','no fire'],autopct='%1.1f%%',colors=['yellow','blue'])
plt.title('Fire Alarm')
plt.show()
```



```
#visualizing temperature
sns.displot(df['Temperature[C]'])

<seaborn.axisgrid.FacetGrid at 0x7d8edd23a8c0>
```

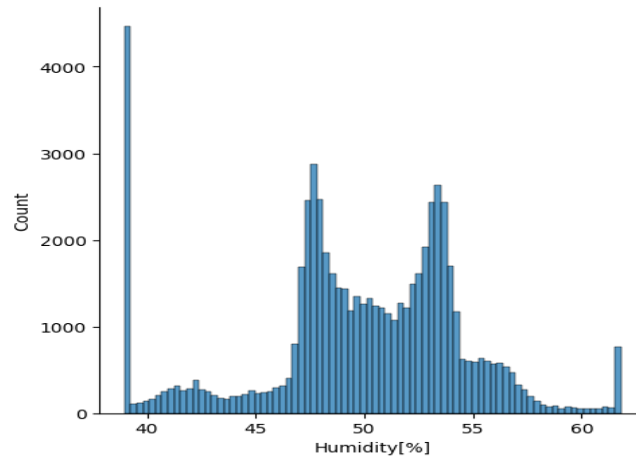


Bivariate Analysis

```

#visualizing Humidity
sns.displot(df['Humidity[%]'])

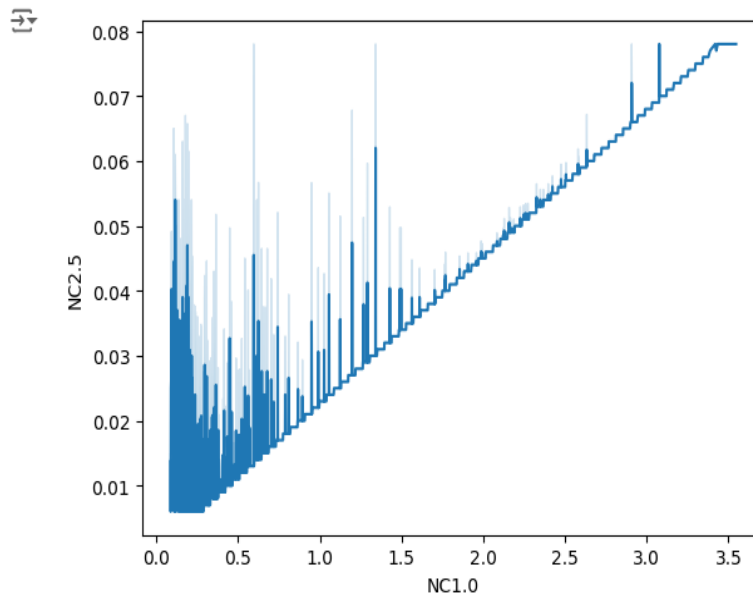
<seaborn.axisgrid.FacetGrid at 0x7d8edcad3cd0>
  
```



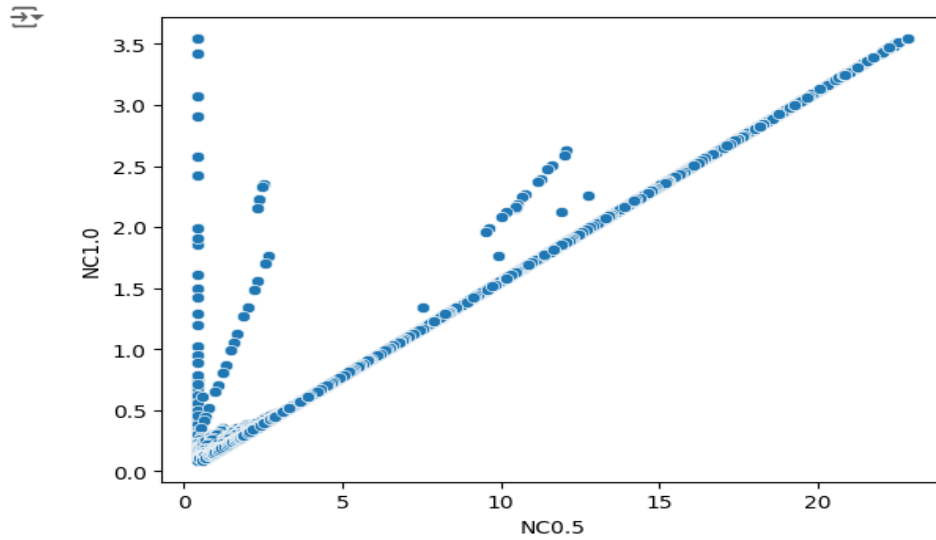
Bivariate Analysis

```

sns.lineplot(x='NC1.0',y='NC2.5', data=df)
plt.xlabel('NC1.0')
plt.ylabel('NC2.5')
plt.show()
  
```



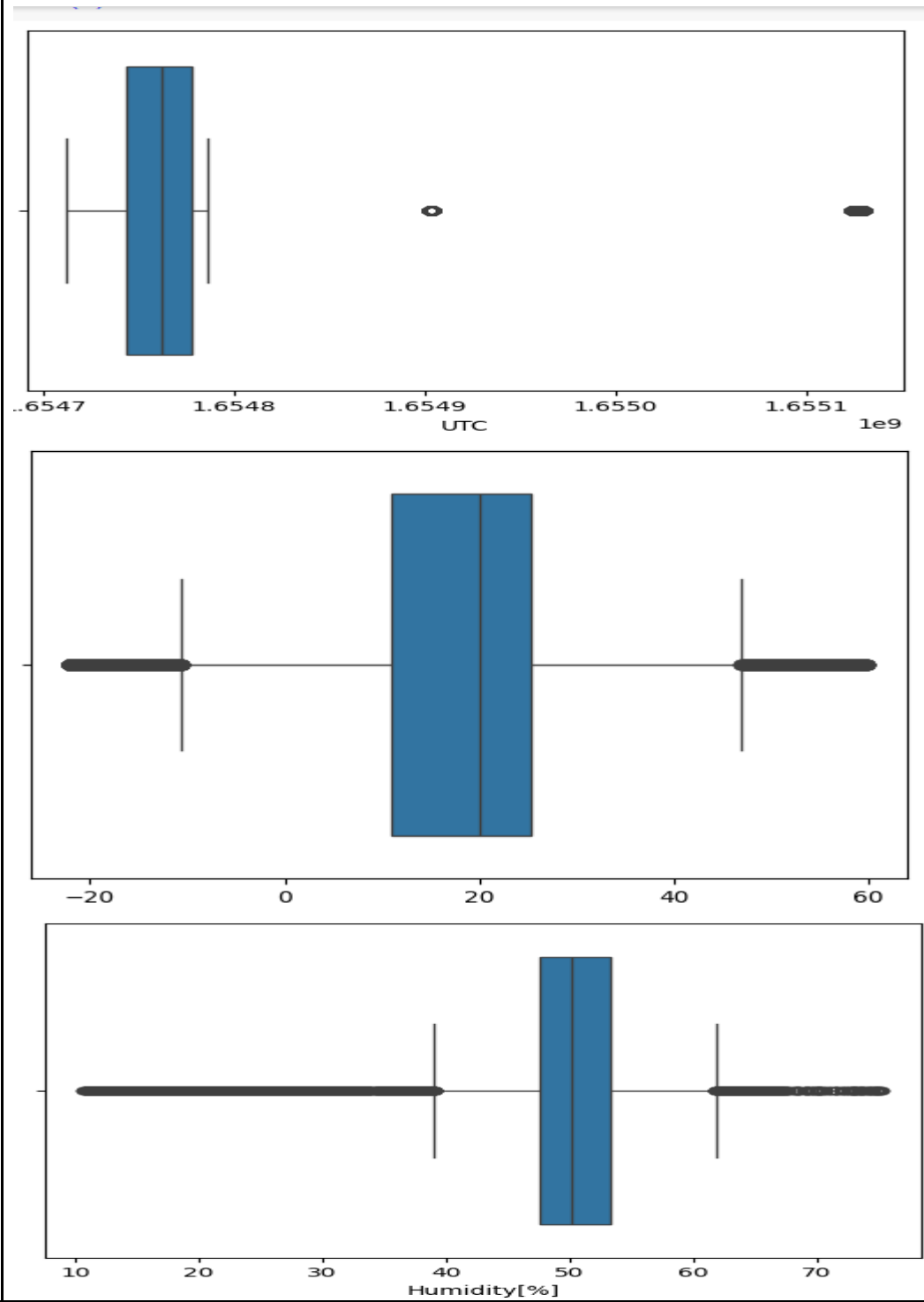
```
sns.scatterplot(x='NC0.5',y='NC1.0', data=df)
plt.xlabel('NC0.5')
plt.ylabel('NC1.0')
plt.show()
```

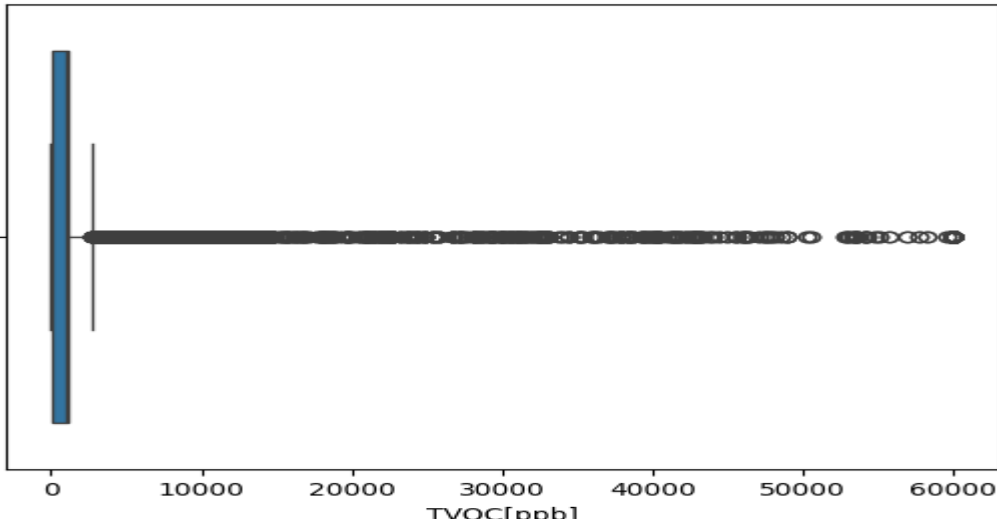


Multivariate Analysis



Outliers and Anomalies



																																																																																																							
Data Preprocessing Code Screenshots																																																																																																							
Loading Data	<pre>[] df=pd.read_csv('/content/smoke_detection_iot.csv')</pre> <pre>df.head()</pre> <table><thead><tr><th></th><th>Unnamed: 0</th><th>UTC</th><th>Temperature[C]</th><th>Humidity[%]</th><th>TVOC[ppb]</th><th>eCO2[ppm]</th><th>Raw H2</th><th>Raw Ethanol</th><th>Pressure[hPa]</th><th>PM1.0</th><th>PM2.5</th><th>NC0.5</th><th>NC1.0</th><th>NC2.5</th><th>CNT</th><th>Fire Alarm</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>1654733331</td><td>20.000</td><td>57.36</td><td>0</td><td>400</td><td>12306</td><td>18520</td><td>939.735</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1654733332</td><td>20.015</td><td>56.67</td><td>0</td><td>400</td><td>12345</td><td>18651</td><td>939.744</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>1</td><td>0</td></tr><tr><td>2</td><td>2</td><td>1654733333</td><td>20.029</td><td>55.96</td><td>0</td><td>400</td><td>12374</td><td>18764</td><td>939.738</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>2</td><td>0</td></tr><tr><td>3</td><td>3</td><td>1654733334</td><td>20.044</td><td>55.28</td><td>0</td><td>400</td><td>12390</td><td>18849</td><td>939.736</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>3</td><td>0</td></tr><tr><td>4</td><td>4</td><td>1654733335</td><td>20.059</td><td>54.69</td><td>0</td><td>400</td><td>12403</td><td>18921</td><td>939.744</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>0.0</td><td>4</td><td>0</td></tr></tbody></table>		Unnamed: 0	UTC	Temperature[C]	Humidity[%]	TVOC[ppb]	eCO2[ppm]	Raw H2	Raw Ethanol	Pressure[hPa]	PM1.0	PM2.5	NC0.5	NC1.0	NC2.5	CNT	Fire Alarm	0	0	1654733331	20.000	57.36	0	400	12306	18520	939.735	0.0	0.0	0.0	0.0	0.0	0	0	1	1	1654733332	20.015	56.67	0	400	12345	18651	939.744	0.0	0.0	0.0	0.0	0.0	1	0	2	2	1654733333	20.029	55.96	0	400	12374	18764	939.738	0.0	0.0	0.0	0.0	0.0	2	0	3	3	1654733334	20.044	55.28	0	400	12390	18849	939.736	0.0	0.0	0.0	0.0	0.0	3	0	4	4	1654733335	20.059	54.69	0	400	12403	18921	939.744	0.0	0.0	0.0	0.0	0.0	4	0
	Unnamed: 0	UTC	Temperature[C]	Humidity[%]	TVOC[ppb]	eCO2[ppm]	Raw H2	Raw Ethanol	Pressure[hPa]	PM1.0	PM2.5	NC0.5	NC1.0	NC2.5	CNT	Fire Alarm																																																																																							
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Feature Engineering	Attached the codes in final submission.																																																																																																						
Save Processed Data	-																																																																																																						