Data Collection and Preprocessing Phase

Date	June 2024
Team ID	740714
Project Title	Occupancy Rates and Demand in the Hospitality Industry
Maximum Marks	6 Marks

Preparation Template

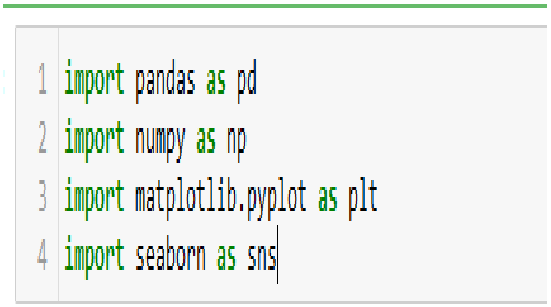
The images will be preprocessed by resizing, normalizing, augmenting, denoising, adjusting contrast, detecting edges, converting color space, cropping, batch normalizing, and whitening data. These steps will enhance data quality, promote model generalization, and improve convergence during neural network training, ensuring robust and efficient performance across various computer vision tasks.

Section	**Description**
Data Overview	There are many popular open sources for collecting the data. Eg: kaggle.com, UCI repository, etc. In this project we have used .csv data.
Data Preparation	These are the general steps of pre-processing the data before using it for machine learning
Handling missing values	We use Handling missing values For checking the null values
Handling categorical data	As we can see our dataset has categorical data we must convert the categorical data to integer encoding or binary encoding

Handling Outliers in Data	With the help of boxplot, outliers are visualized. And here we are going to find upper bound and lower bound of numerical features with some mathematical formula.

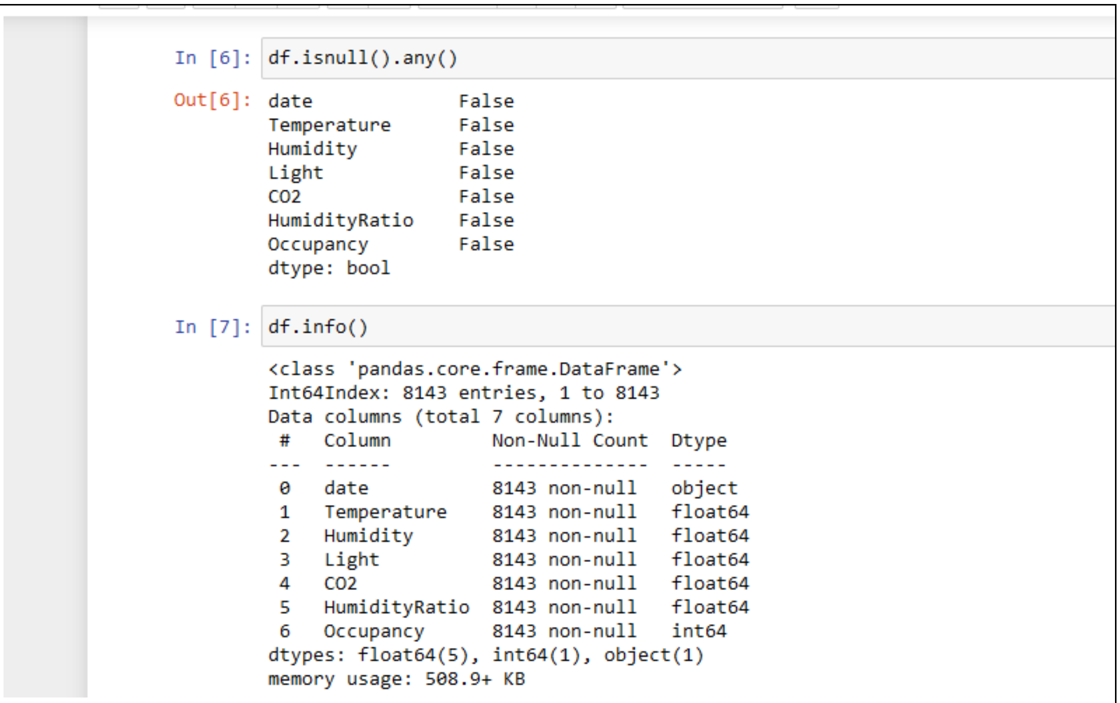
Data Preparation

Collect the dataset	Please refer to the link given below to download the dataset. https://www.kaggle.com/datasets/robmarkcole/occupancy-detection-data-set-uci https://www.kaggle.com/code/turksoyomer/hvac-occupancy-detection-with-ml-and-dl-methods

Importing the libraries	
	`import pandas as pd`
	`import numpy as np`
	`import matplotlib.pyplot as plt`
	`import seaborn as sns`

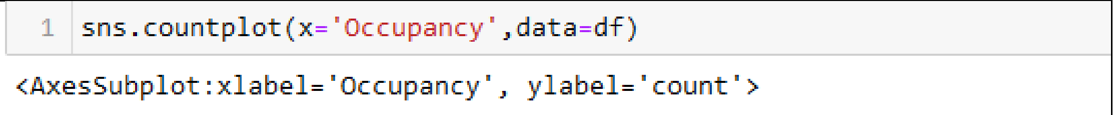
Loading Data	We use the code Data =pd.read_csv(‘datatraining.csv’) For reading the dataset

Handling missing values

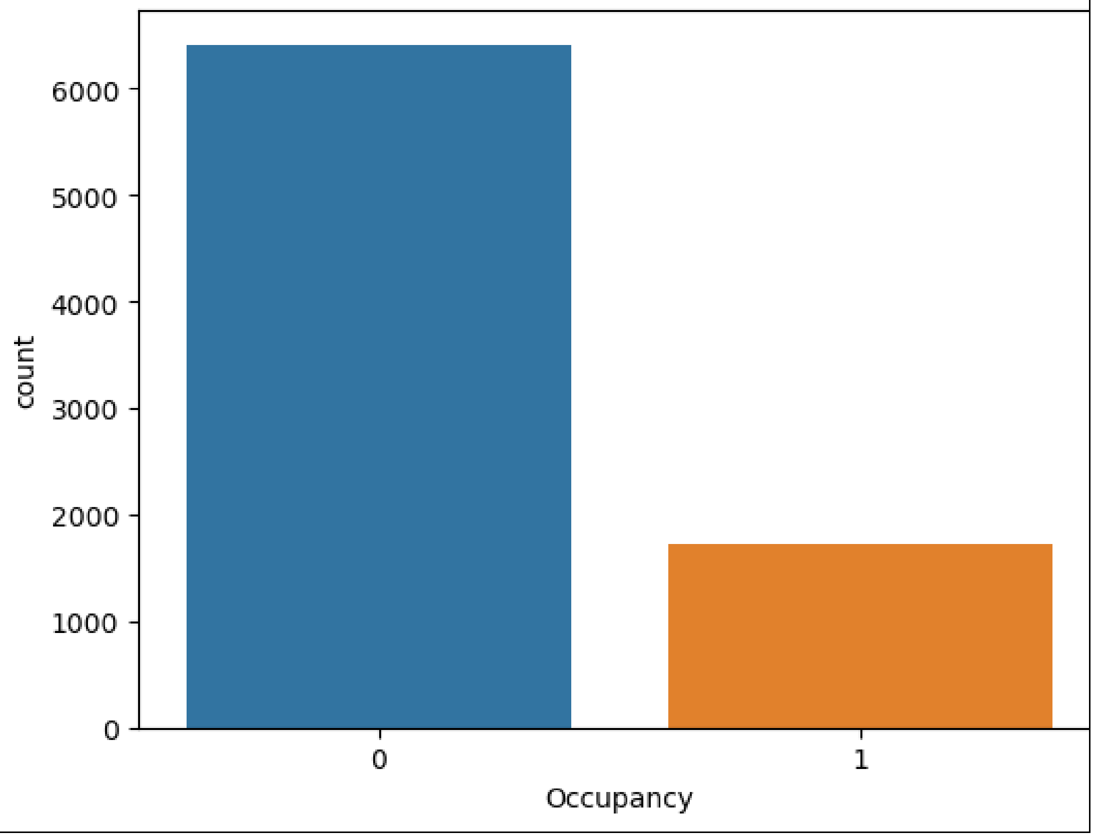


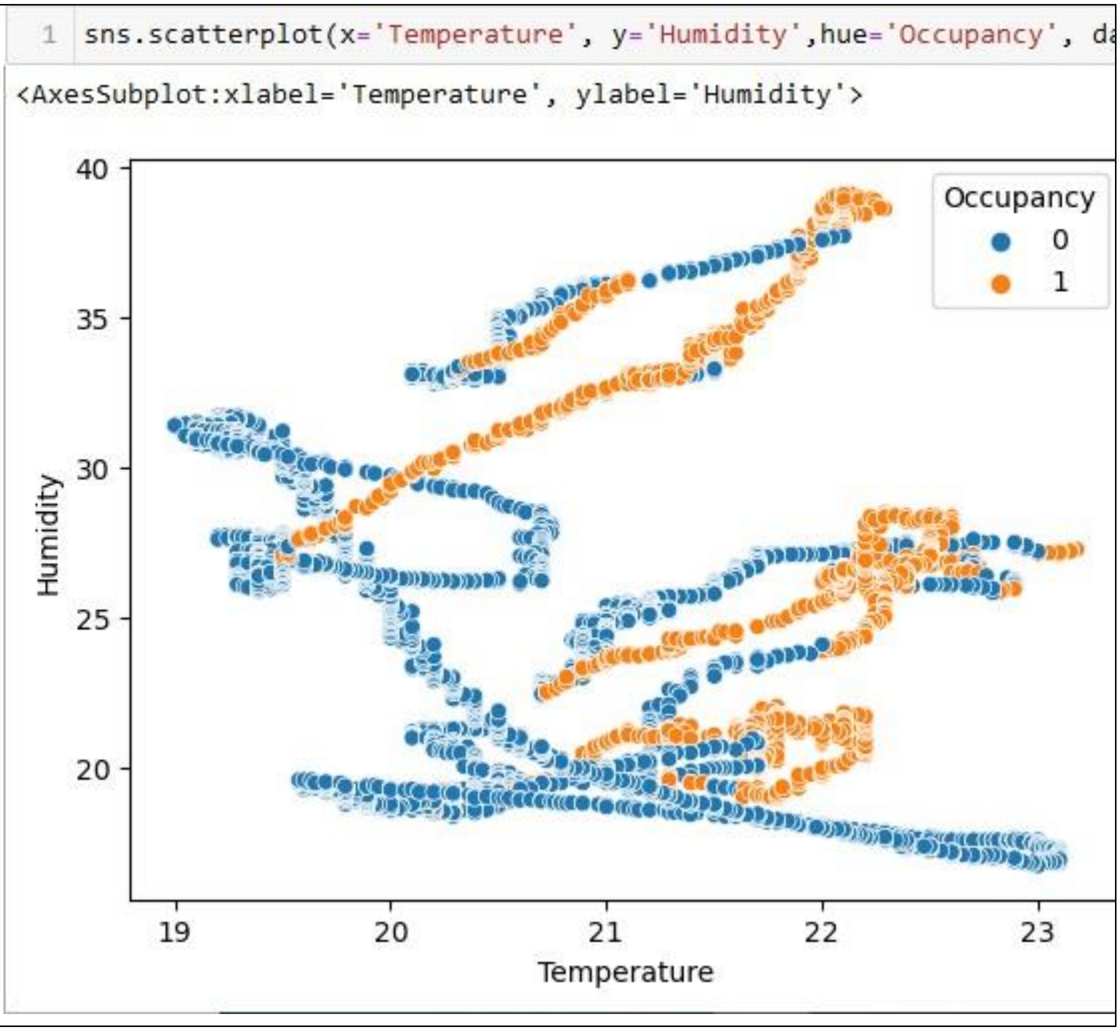
```
In [6]: df.isnull().any()

Out[6]: date             False
        Temperature      False
        Humidity         False
        Light            False
        CO2              False
        HumidityRatio    False
        Occupancy        False
        dtype: bool

In [7]: df.info()

        <class 'pandas.core.frame.DataFrame'>
        Int64Index: 8143 entries, 1 to 8143
        Data columns (total 7 columns):
         #   Column         Non-Null Count  Dtype
        ---  ------         --------------  -----
         0   date           8143 non-null   object
         1   Temperature    8143 non-null   float64
         2   Humidity       8143 non-null   float64
         3   Light          8143 non-null   float64
         4   CO2            8143 non-null   float64
         5   HumidityRatio  8143 non-null   float64
         6   Occupancy      8143 non-null   int64
        dtypes: float64(5), int64(1), object(1)
        memory usage: 508.9+ KB
```

Handling Outliers



```
sns.countplot(x='Occupancy',data=df)

<AxesSubplot:xlabel='Occupancy', ylabel='count'>
```





```
sns.scatterplot(x='Temperature', y='Humidity',hue='Occupancy', da
```

```
<AxesSubplot:xlabel='Temperature', ylabel='Humidity'>
```