```
  import pandas as pd
  import numpy as np
  import seaborn as sns
  from datetime import datetime
  import matplotlib.pyplot as plt
  sns.set_style("whitegrid")
```

```
# importing the dataset
ABNB="https://raw.githubusercontent.com/ukantjadia/30-days-of-Mahcine-Learning/Main/DAY-01/ABNB.csv"
df = pd.read_csv(ABNB)
```

```
# Summary Stats

df.describe()
```

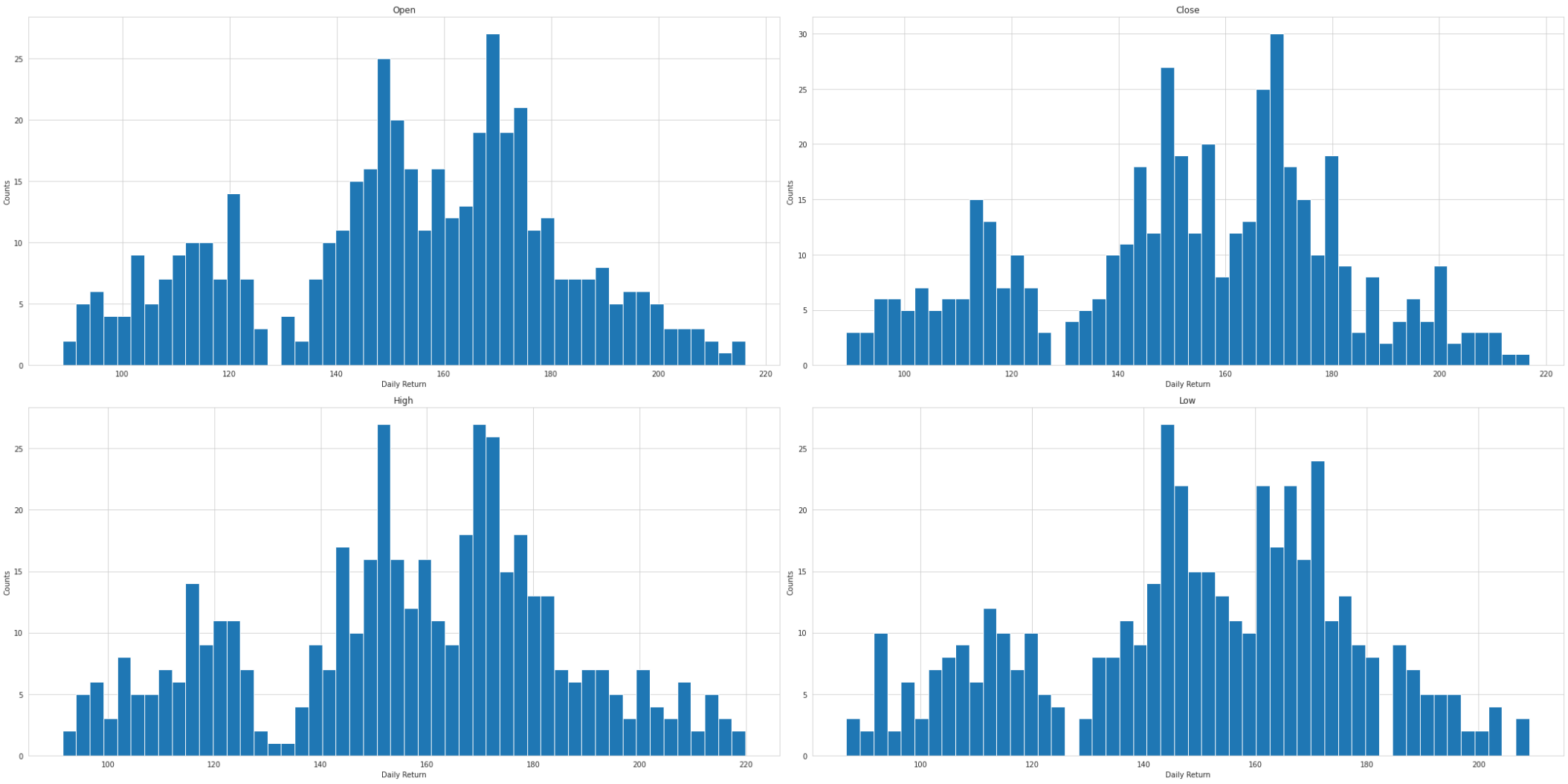
	Open	High	Low	Close	Adj Close	Volume
count	454.000000	454.000000	454.000000	454.000000	454.000000	4.540000e+02
mean	152.735925	156.465595	148.969855	152.729185	152.729185	6.690328e+06
std	28.340932	29.107813	27.490223	28.226659	28.226659	4.417387e+06
min	88.879997	91.459999	86.709999	89.080002	89.080002	1.995400e+06
25%	136.821507	139.842495	132.920002	135.955002	135.955002	4.114375e+06
50%	154.932495	159.099998	151.230004	155.654999	155.654999	5.450000e+06
75%	172.556507	175.974998	168.595005	171.744996	171.744996	7.631375e+06
max	216.240005	219.940002	209.089996	216.839996	216.839996	3.975500e+07

```
import plotly.graph_objs as go
fig = go.Figure([go.Ohlc(x=df['Date'],
                         open=df['Open'],
                         high=df['High'],
                         low=df['Low'],
                         close=df['Close'])])
fig.update(layout_xaxis_rangeslider_visible=True)
fig.show()
```


```
plt.figure(figsize=(30,15));
dff = ['Open','Close','High','Low']
for no,col in enumerate(dff,1):
  plt.subplot(2,2,no)
  df[str(col)].hist(bins=50)
  plt.xlabel('Daily Return')
```

```
  plt.title(f'{col}')

plt.tight_layout()
```




```
# Creating the dataframe of date formate and setting it to index
df['Date'] = pd.to_datetime(df['Date'])
df2 = df.set_index('Date')
df2.head()
```

Date	Open	High	Low	Close	Adj Close	Volume
2020-12-11	146.550003	151.500000	135.100006	139.250000	139.250000	26980800
2020-12-14	135.000000	135.300003	125.160004	130.000000	130.000000	16966100
2020-12-15	126.690002	127.599998	121.500000	124.800003	124.800003	10914400
2020-12-16	125.830002	142.000000	124.910004	137.990005	137.990005	20409600
2020-12-17	143.000000	152.449997	142.669998	147.050003	147.050003	15054700

```
def create_features_datetime(df):
    df['Year']=df.index.year
    df['Month']=df.index.month
    df['dow']=df.index.day_of_week

    return df
df_tr=create_features_datetime(df2)
df_tr.head()
```

Date	Open	High	Low	Close	Adj Close	Volume	Year	Month	dow
2020-12-11	146.550003	151.500000	135.100006	139.250000	139.250000	26980800	2020	12	4
2020-12-14	135.000000	135.300003	125.160004	130.000000	130.000000	16966100	2020	12	0
2020-12-15	126.690002	127.599998	121.500000	124.800003	124.800003	10914400	2020	12	1
2020-12-16	125.830002	142.000000	124.910004	137.990005	137.990005	20409600	2020	12	2
2020-12-17	143.000000	152.449997	142.669998	147.050003	147.050003	15054700	2020	12	3

```
X = df_tr.drop('Close',axis=1)
y = df_tr['Close']
print(X)
```

```
                 Open        High         Low   Adj Close    Volume  Year  \
Date
2020-12-11  146.550003  151.500000  135.100006  139.250000  26980800  2020
2020-12-14  135.000000  135.300003  125.160004  130.000000  16966100  2020
2020-12-15  126.690002  127.599998  121.500000  124.800003  10914400  2020
2020-12-16  125.830002  142.000000  124.910004  137.990005  20409600  2020
2020-12-17  143.000000  152.449997  142.669998  147.050003  15054700  2020
...                ...         ...         ...         ...       ...   ...
2022-09-26  101.779999  105.360001  101.559998  103.230003   5278800  2022
2022-09-27  106.040001  108.169998  104.139999  106.370003   5081000  2022
2022-09-28  106.700996  111.129997  105.779999  110.690002   4518200  2022
2022-09-29  109.190002  109.474998  105.169998  106.660004   4259500  2022
2022-09-30  104.760002  109.080002  104.730003  105.040001   4747800  2022

            Month  dow
Date
2020-12-11     12    4
2020-12-14     12    0
2020-12-15     12    1
2020-12-16     12    2
2020-12-17     12    3
...           ...  ...
2022-09-26      9    0
2022-09-27      9    1
2022-09-28      9    2
2022-09-29      9    3
2022-09-30      9    4

[454 rows x 8 columns]
```

```
# test size 20% and train size 80%

from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
X_train, X_test, y_train, y_test = train_test_split(X,y, test_size=0.2,random_state=0)
X_train, y_train = np.array(X_train), np.array(y_train)
X_test, y_test = np.array(X_test),np.array(y_test)
print(f"{y_test.shape} {X_test.shape}")
```

```
(91,) (91, 8)
```

```
# Importing and creating the DecisionTreemodel

from sklearn.tree import DecisionTreeRegressor
dtree = DecisionTreeRegressor(random_state=0)
dtree.fit(X_train, y_train)
```

```
DecisionTreeRegressor(random_state=0)
```

```
pred=dtree.predict(X)
y_pred_prob_df = pd.DataFrame(data=pred, columns=['Close_predict'])
df['Close_predict'] = y_pred_prob_df
df
```

```
/usr/local/lib/python3.8/dist-packages/sklearn/base.py:443: UserWarning:

X has feature names, but DecisionTreeRegressor was fitted without feature names
```

	Date	Open	High	Low	Close	Adj Close	Volume	Close_predict
0	2020-12-11	146.550003	151.500000	135.100006	139.250000	139.250000	26980800	139.250000
1	2020-12-14	135.000000	135.300003	125.160004	130.000000	130.000000	16966100	131.589996
2	2020-12-15	126.690002	127.599998	121.500000	124.800003	124.800003	10914400	124.800003
3	2020-12-16	125.830002	142.000000	124.910004	137.990005	137.990005	20409600	137.990005
4	2020-12-17	143.000000	152.449997	142.669998	147.050003	147.050003	15054700	147.050003
...	...	...	...	...	...	...	...	...
449	2022-09-26	101.779999	105.360001	101.559998	103.230003	103.230003	5278800	103.230003
450	2022-09-27	106.040001	108.169998	104.139999	106.370003	106.370003	5081000	106.370003
451	2022-09-28	106.700996	111.129997	105.779999	110.690002	110.690002	4518200	110.690002
452	2022-09-29	109.190002	109.474998	105.169998	106.660004	106.660004	4259500	106.660004

453	2022-09-30	104.760002	109.080002	104.730003	105.040001	105.040001	4747800	104.949997

454 rows × 8 columns

Decision Tree Regressor

```
from sklearn import metrics
import math
y_pred = dtree.predict(X_test)
mae = metrics.mean_absolute_error(y_test, y_pred)
mse = metrics.mean_squared_error(y_test, y_pred)
r2 = metrics.r2_score(y_test, y_pred)
rmse = math.sqrt(mse)
# accu = metrics.accuracy_score(y_test, y_pred)

print('MAE is {}'.format(mae))
print('MSE is {}'.format(mse))
print('R2 score is {}'.format(r2))
print('RMSE score is {}'.format(rmse))
# print('Accuracy score is {}'.format(accu*100))
```

```
MAE is 0.3470327142857169
MSE is 0.269499517831574
R2 score is 0.9996783892298543
RMSE score is 0.5191334296995079
```

Random Forest Regressor

```
from sklearn.ensemble import RandomForestRegressor
rf = RandomForestRegressor(random_state=0)
rf.fit(X_train, y_train)
```

```
RandomForestRegressor(random_state=0)
```

```
from sklearn import metrics
import math
y_pred = rf.predict(X_test)
mae = metrics.mean_absolute_error(y_test, y_pred)
mse = metrics.mean_squared_error(y_test, y_pred)
r2 = metrics.r2_score(y_test, y_pred)
rmse = math.sqrt(mse)

print('MAE is {}'.format(mae))
print('MSE is {}'.format(mse))
print('R2 score is {}'.format(r2))
print('RMSE score is {}'.format(rmse))
```

```
MAE is 0.29589454329670223
MSE is 0.2637844988276057
R2 score is 0.9996852093224394
RMSE score is 0.5135995510391396
```

Visualize Random Forest Regressor

```
pred_rdt=rf.predict(X)
y_pred_prob_df_rdt = pd.DataFrame(data=pred_rdt, columns=['Close_predict'])
df['Close_predict'] = y_pred_prob_df_rdt
df
```

```
/usr/local/lib/python3.8/dist-packages/sklearn/base.py:443: UserWarning:

X has feature names, but RandomForestRegressor was fitted without feature names
```

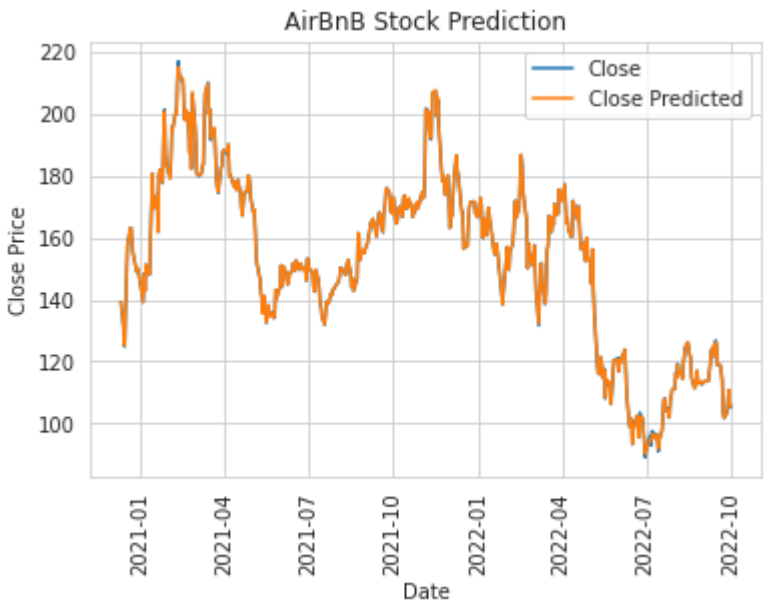
	Date	Open	High	Low	Close	Adj Close	Volume	Close_predict
0	2020-12-11	146.550003	151.500000	135.100006	139.250000	139.250000	26980800	139.164899

1	2020-12-14	135.000000	135.300003	125.160004	130.000000	130.000000	16966100	130.719802
2	2020-12-15	126.690002	127.599998	121.500000	124.800003	124.800003	10914400	125.152402
3	2020-12-16	125.830002	142.000000	124.910004	137.990005	137.990005	20409600	136.527903
4	2020-12-17	143.000000	152.449997	142.669998	147.050003	147.050003	15054700	146.952300
...	...	...	...	...	...	...	...	...
449	2022-09-26	101.779999	105.360001	101.559998	103.230003	103.230003	5278800	103.366302
450	2022-09-27	106.040001	108.169998	104.139999	106.370003	106.370003	5081000	106.500002
451	2022-09-28	106.700996	111.129997	105.779999	110.690002	110.690002	4518200	110.838201
452	2022-09-29	109.190002	109.474998	105.169998	106.660004	106.660004	4259500	106.787003
453	2022-09-30	104.760002	109.080002	104.730003	105.040001	105.040001	4747800	105.485001

454 rows × 8 columns

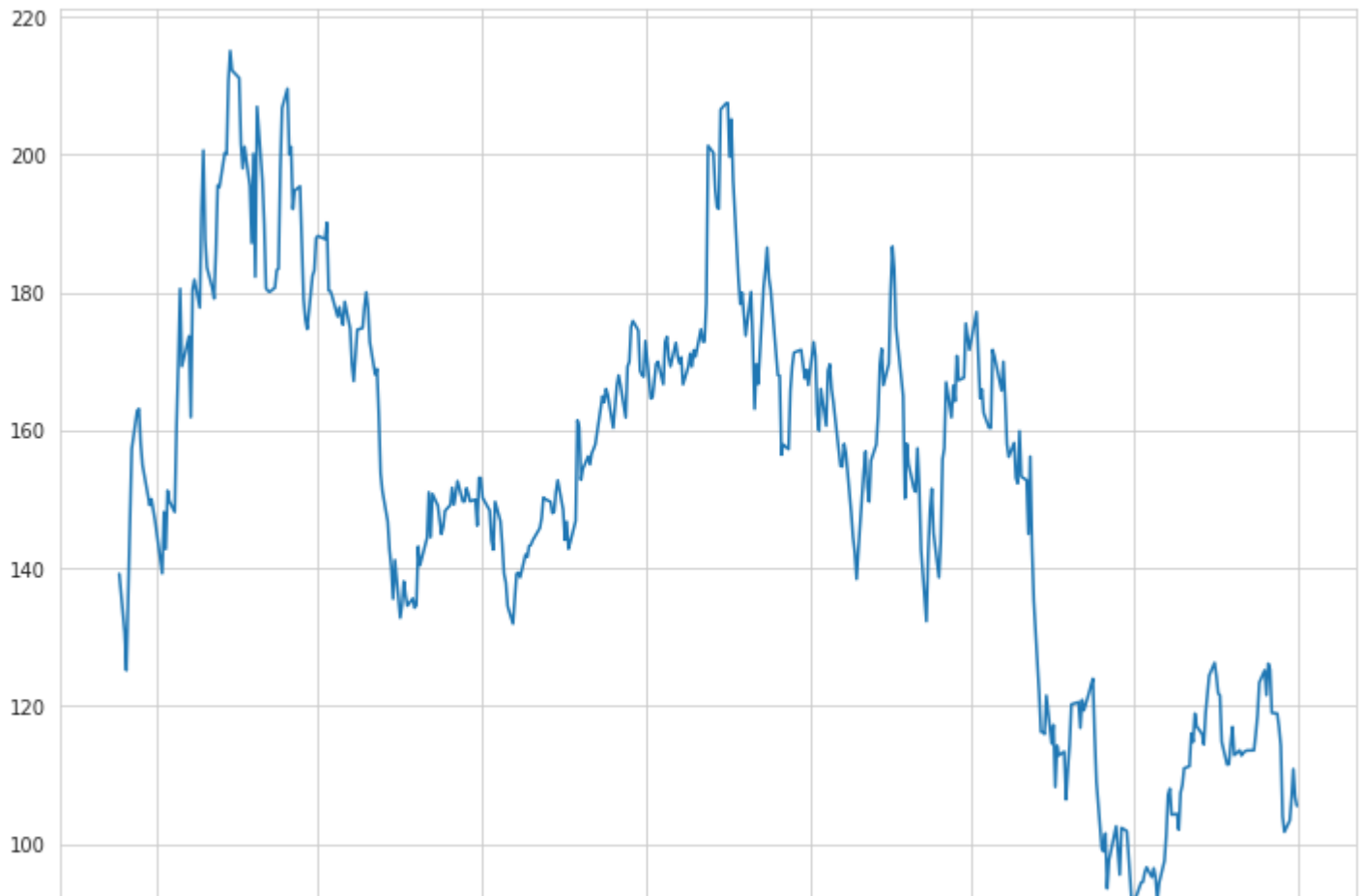
```
Date = df['Date']
Close = df['Close']
Close2 = df['Close_predict']
```

```
plt.plot (Date,Close, label='Close')
plt.plot (Date,Close2, label='Close Predicted')
plt.title ('AirBnB Stock Prediction')
plt.xlabel ('Date')
plt.ylabel ('Close Price')
plt.legend(loc = 'upper right')
plt.xticks(rotation=90)
plt.show()
```




```
plt.figure(figsize=(12,9))
plt.subplot(1,1,1)
plt.plot(Date,Close2,label='Close Predicted')
```

```
[<matplotlib.lines.Line2D at 0x7fbe296f7a30>]
```




2021-01
2021-04
2021-07
2021-10
2022-01
2022-04
2022-07
2022-10