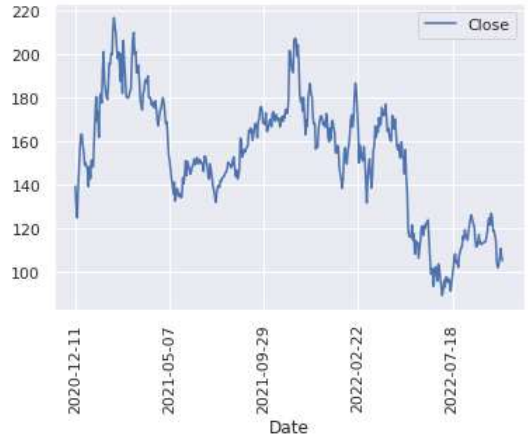
```
import pandas as pd
import seaborn as sns
import numpy as np
import matplotlib.pyplot as plt
sns.set_theme(color_codes=True)
```

```
df = pd.read_csv('ABNB.csv')
df
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	2020-12-11	146.550003	151.500000	135.100006	139.250000	139.250000	26980800
1	2020-12-14	135.000000	135.300003	125.160004	130.000000	130.000000	16966100
2	2020-12-15	126.690002	127.599998	121.500000	124.800003	124.800003	10914400
3	2020-12-16	125.830002	142.000000	124.910004	137.990005	137.990005	20409600
4	2020-12-17	143.000000	152.449997	142.669998	147.050003	147.050003	15054700
...	...	...	...	...	...	...	...
449	2022-09-26	101.779999	105.360001	101.559998	103.230003	103.230003	5278800
450	2022-09-27	106.040001	108.169998	104.139999	106.370003	106.370003	5081000

```
df.plot(x='Date', y='Close')
plt.xticks(rotation=90)
```

```
(array([-100.,    0.,  100.,  200.,  300.,  400.,  500.]),
 <a list of 7 Text major ticklabel objects>)
```




```
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	M
2020-12-11	146.550003	151.500000	135.100006	139.250000	139.250000	26980800	2020	
2020-12-14	135.000000	135.300003	125.160004	130.000000	130.000000	16966100	2020	
2020-12-15	126.690002	127.599998	121.500000	124.800003	124.800003	10914400	2020	

Build Machine Learning Model

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

```
#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)
```

Decision Tree Regressor

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

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

```
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)

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

```
MAE is 0.3470327142857169
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=rf.predict(X)
y_pred_prob_df = pd.DataFrame(data=pred, columns=['Close_predict'])
df['Close_predict'] = y_pred_prob_df
df
```

	Date	Open	High	Low	Close	Adj Close	Volume	Cl
0	2020-12-11	146.550003	151.500000	135.100006	139.250000	139.250000	26980800	
1	2020-12-14	135.000000	135.300003	125.160004	130.000000	130.000000	16966100	
2	2020-12-15	126.690002	127.599998	121.500000	124.800003	124.800003	10914400	
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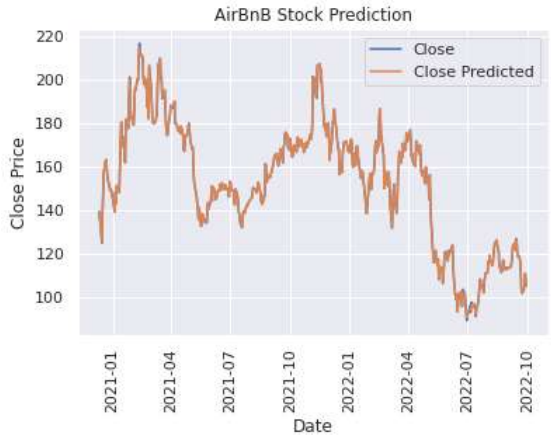
4	2020-12-17	143.000000	152.449997	142.669998	147.050003	147.050003	15054700	
...	...	...	...	...	...	...	...	
449	2022-09-26	101.779999	105.360001	101.559998	103.230003	103.230003	5278800	
450	2022-09-27	106.040001	108.169998	104.139999	106.370003	106.370003	5081000	

```
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()
```



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