Ag19

January 15, 2024

[34]:

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

import warnings
warnings.filterwarnings("ignore")
# sns.set_style("darkgrid", {"grid.color": ".6",
#                             "grid.linestyle": ":"})

from sklearn.preprocessing import StandardScaler , MinMaxScaler
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier,GradientBoostingClassifier
from sklearn.linear_model import LogisticRegression
from sklearn.svm import SVC
import seaborn as sns
from sklearn.metrics import accuracy_score
from sklearn.model_selection import GridSearchCV
from sklearn.model_selection import RandomizedSearchCV
from sklearn.tree import DecisionTreeClassifier

from xgboost import XGBClassifier
# from sklearn.metrics import r2_score
# from sklearn.metrics import mean_squared_error
# from sklearn.model_selection import GridSearchCV
```

[15]:

```
from vnstock import *
import talib
import matplotlib.pyplot as plt


df = stock_historical_data("VNINDEX", "2023-06-01", "2023-09-18", "1D",␣
 ↪"index", source='TCBS')
df
```

```
Time range is 109 days. Looping through 1 requests
```

[15]:

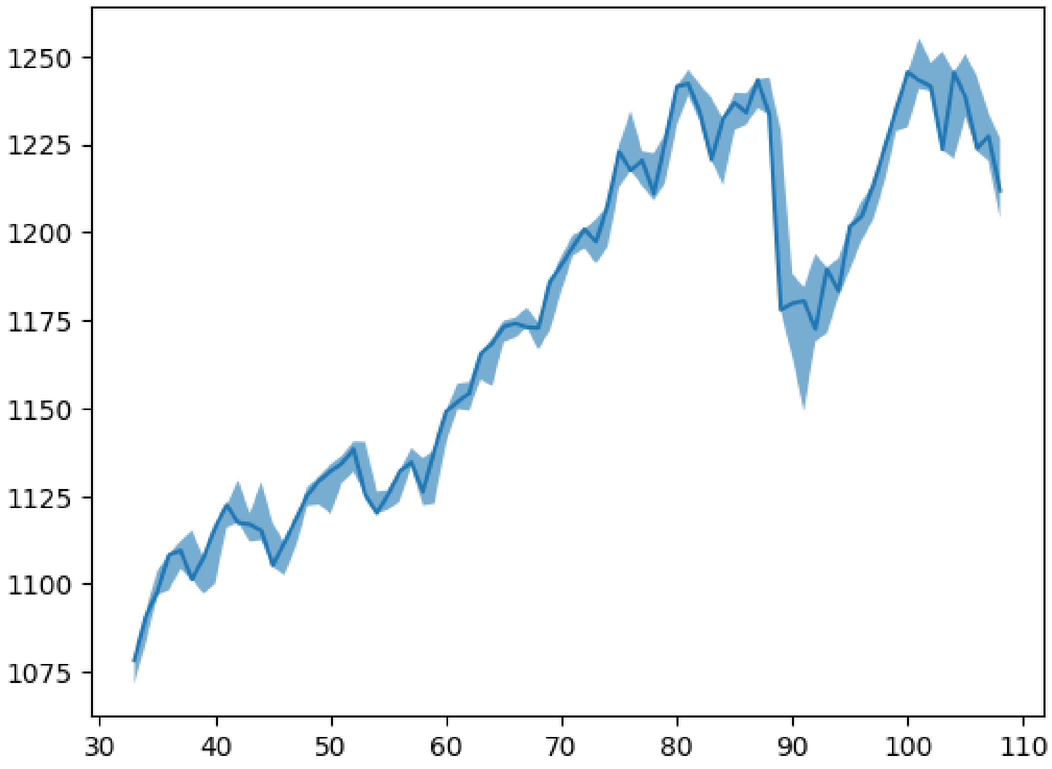
```
            time     open     high      low    close      volume   ticker
33   2023-06-01  1076.50  1078.39  1071.61  1078.39   856813100  VNINDEX
34   2023-06-02  1084.19  1092.24  1083.36  1090.84  1037413832  VNINDEX
35   2023-06-05  1099.66  1103.81  1096.76  1097.82   948361281  VNINDEX
36   2023-06-06  1098.80  1108.31  1098.28  1108.31   842755231  VNINDEX
37   2023-06-07  1110.79  1112.28  1104.26  1109.54  1000674077  VNINDEX
..          …        …        …       …        …          …        …
104  2023-09-12  1223.55  1245.44  1220.85  1245.44   967867696  VNINDEX
105  2023-09-13  1249.06  1250.61  1232.84  1238.39  1263786726  VNINDEX
106  2023-09-14  1238.21  1244.21  1223.03  1223.81  1227453311  VNINDEX
107  2023-09-15  1225.90  1233.87  1220.27  1227.36   917361628  VNINDEX
108  2023-09-18  1225.60  1226.56  1203.88  1211.81   844996338  VNINDEX

[76 rows x 7 columns]
```

[12]:

```
plt.plot (df['close'])
plt.fill_between(df.index, df['low'],df['high'], alpha = 0.6 )
```

[12]:

```
<matplotlib.collections.PolyCollection at 0x168aaf1f0>
```



[16]:

```
import seaborn as sns
features = ['open', 'high', 'low', 'close', 'volume']
```

```python
plt.subplots(figsize=(20,10))

for i, col in enumerate(features):
  plt.subplot(2,3,i+1)
  sns.distplot(df[col])
plt.show()
```

```
/var/folders/cs/8r3m5sjs0rd7ts526sxtp81c0000gn/T/ipykernel_1995/191183143.py:8:
UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

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/var/folders/cs/8r3m5sjs0rd7ts526sxtp81c0000gn/T/ipykernel_1995/191183143.py:8:
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```
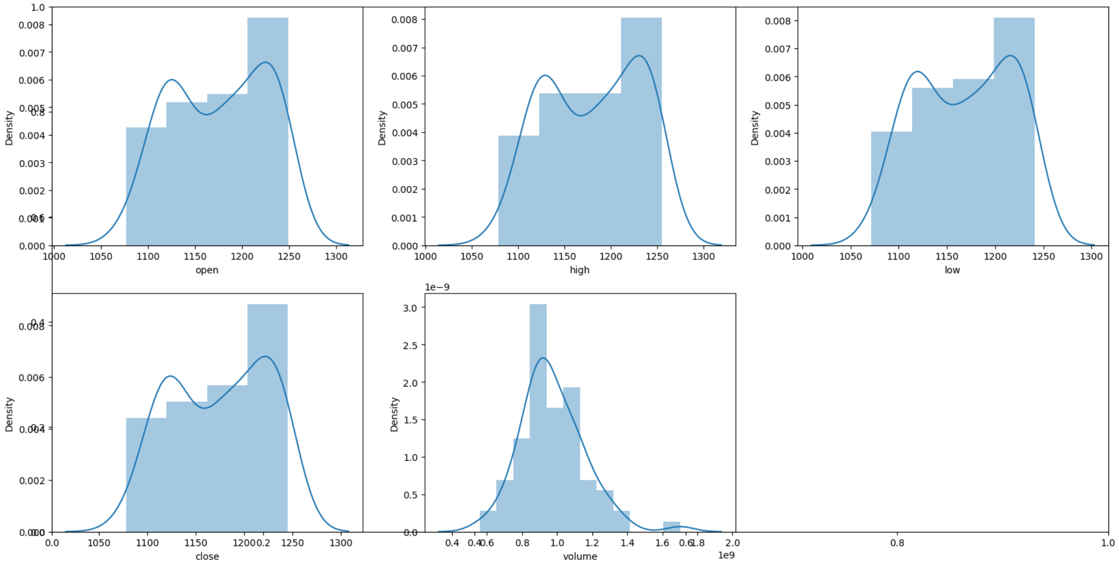
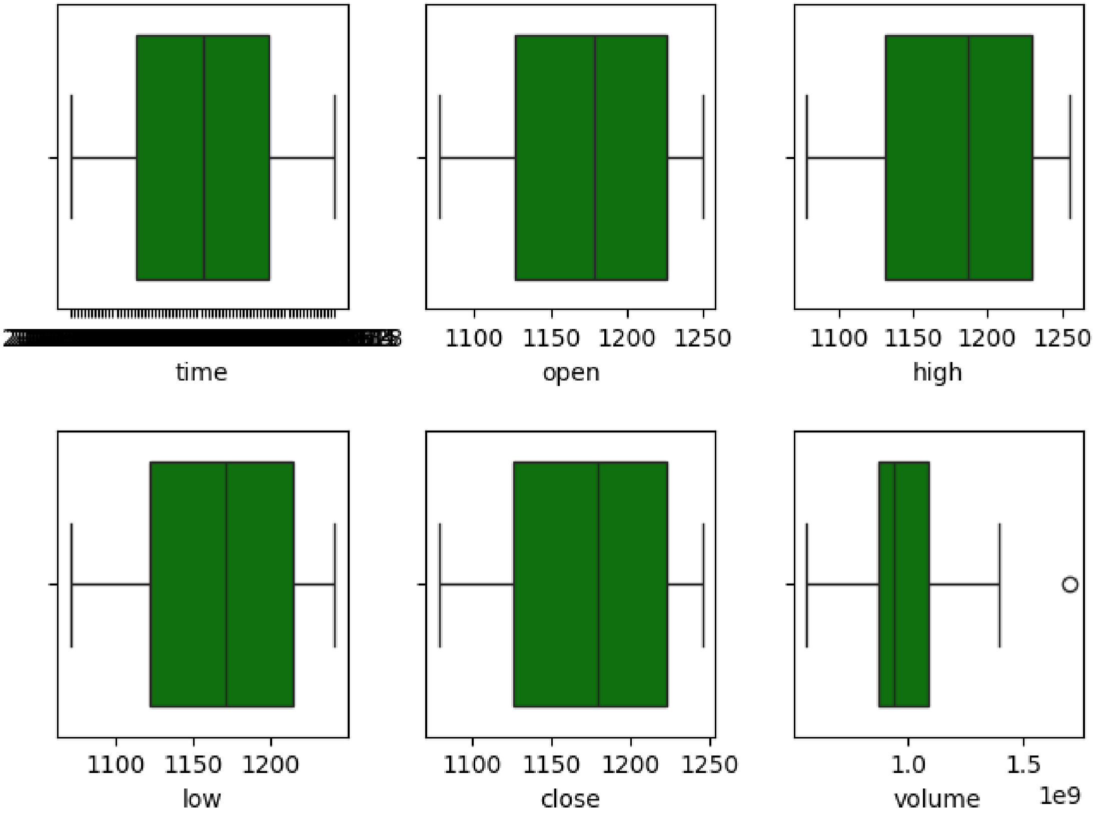
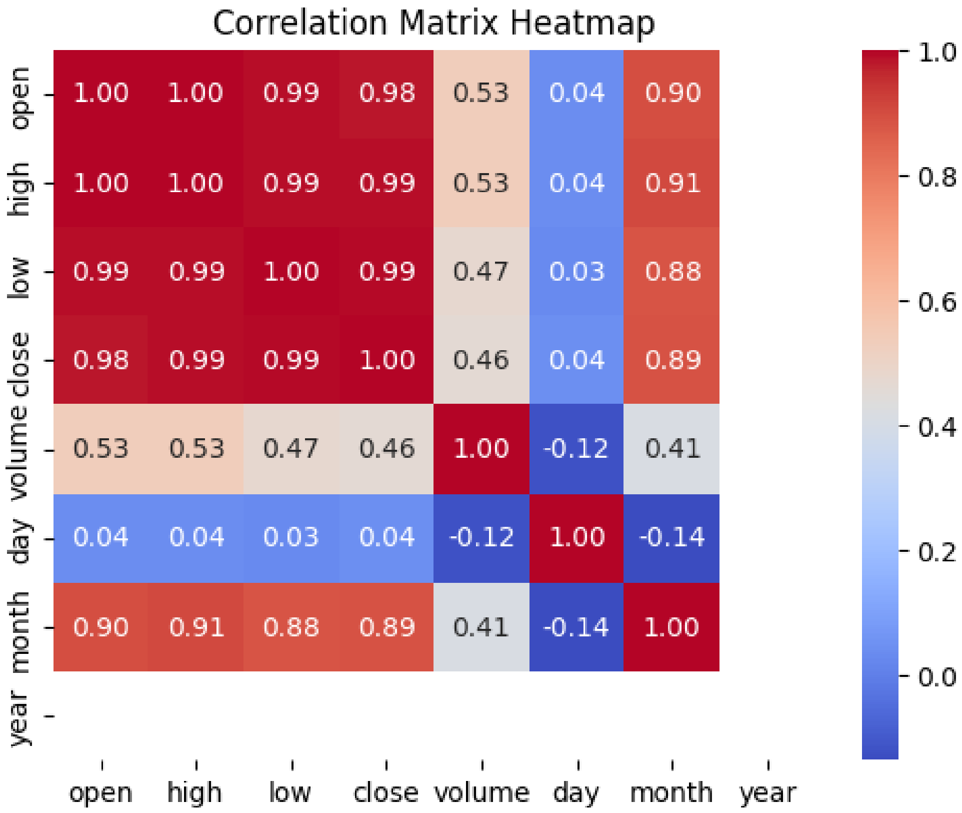



[20]:
```python
' Box plot '
# fig = plt.figure(figsize=(16,16))
temp = df.drop(['ticker'], axis=1).columns.tolist()
for i, item in enumerate(temp):
    plt.subplot(2, 3, i+1)
    sns.boxplot(data=df, x=item, color='green')
plt.tight_layout(pad=0.4, w_pad=0.5, h_pad=2.0)
plt.show()
```



[33]:
```
' Heat map'

corr_matrix = df.drop(['time','ticker'],axis=1).corr()

# Set up the matplotlib figure
# plt.figure(figsize=(20, 16))

# Draw the heatmap
sns.heatmap(corr_matrix, annot=True, fmt=".2f", cmap='coolwarm')

# Add title
plt.title('Correlation Matrix Heatmap')

# Show the plot
plt.show()
```



[28]:
```
splitted = df['time'].str.split('-', expand=True)

df['day'] = splitted[2].astype('int')
df['month'] = splitted[1].astype('int')
df['year'] = splitted[0].astype('int')
```

[29]:
```
# from fbprophet import Prophet
```

[29]:
```
           time     open     high      low    close      volume   ticker  day  \
33   2023-06-01  1076.50  1078.39  1071.61  1078.39   856813100  VNINDEX    1
34   2023-06-02  1084.19  1092.24  1083.36  1090.84  1037413832  VNINDEX    2
35   2023-06-05  1099.66  1103.81  1096.76  1097.82   948361281  VNINDEX    5
36   2023-06-06  1098.80  1108.31  1098.28  1108.31   842755231  VNINDEX    6
37   2023-06-07  1110.79  1112.28  1104.26  1109.54  1000674077  VNINDEX    7
..          …        …        …        …        …           …      …  …
104  2023-09-12  1223.55  1245.44  1220.85  1245.44   967867696  VNINDEX   12
105  2023-09-13  1249.06  1250.61  1232.84  1238.39  1263786726  VNINDEX   13
106  2023-09-14  1238.21  1244.21  1223.03  1223.81  1227453311  VNINDEX   14
107  2023-09-15  1225.90  1233.87  1220.27  1227.36   917361628  VNINDEX   15
108  2023-09-18  1225.60  1226.56  1203.88  1211.81   844996338  VNINDEX   18
```

```
     month  year
33       6  2023
34       6  2023
35       6  2023
36       6  2023
37       6  2023
..     …   …
104      9  2023
105      9  2023
106      9  2023
107      9  2023
108      9  2023

[76 rows x 10 columns]
```

[43]:
```python
X = df.drop(['time','ticker','close'], axis=1)
y = df['close']

y
```

[43]:
```
33     1078.39
34     1090.84
35     1097.82
36     1108.31
37     1109.54
        …
104    1245.44
105    1238.39
106    1223.81
107    1227.36
108    1211.81
Name: close, Length: 76, dtype: float64
```

[45]:
```python
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,␣
 ↪random_state=42)

scaler = StandardScaler()

# Fit the StandardScaler on the training dataset
scaler.fit(X_train)

# Transform the training dataset
# using the StandardScaler
x_train_scaled = scaler.transform(X_train)
x_test_scaled = scaler.transform(X_test)
```

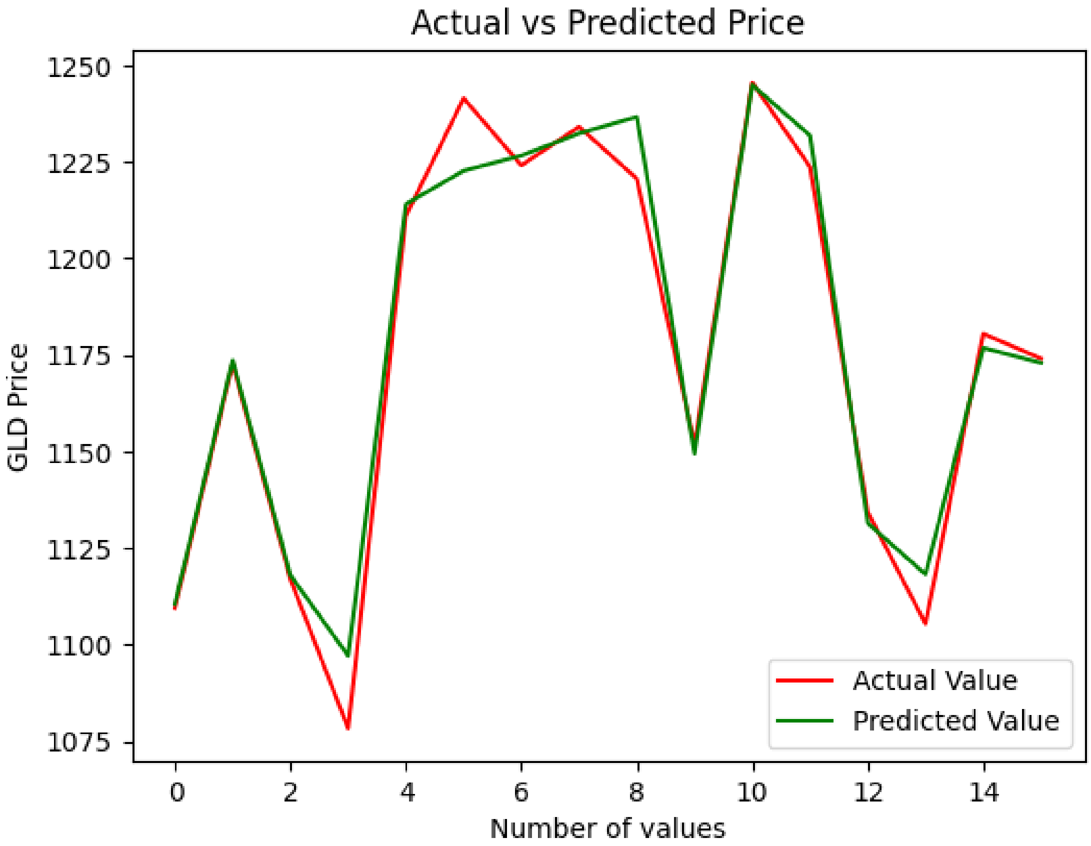
[46]:

```
from xgboost import XGBRegressor
from sklearn.metrics import r2_score

# Create an instance of the XGBRegressor model
model_xgb = XGBRegressor()

# Fit the model to the training data
model_xgb.fit(x_train_scaled, y_train)

# Print the R-squared score on the training data
print("Xgboost Accuracy =", r2_score(
    y_train, model_xgb.predict(x_train_scaled)))
```

```
Xgboost Accuracy = 0.9999999994450424
```

[47]:

```
y_test = list (y_test)

plt.plot(y_test, color='red', label = 'Actual Value')
plt.plot(model_xgb.predict(x_test_scaled), color='green', label='Predicted␣
 ↪Value')
plt.title('Actual vs Predicted Price')
plt.xlabel('Number of values')
plt.ylabel('GLD Price')
plt.legend()
plt.show()
```


Actual vs Predicted Price
GLD Price
1250
1225
1200
1175
1150
1125
1100
1075
0
2
4
6
8
10
12
14
Number of values
Actual Value
Predicted Value