```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import time
import matplotlib.pyplot as plt
import random
from collections import Counter as ct


from sklearn.naive_bayes import GaussianNB
from sklearn.preprocessing import LabelEncoder
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score


from google.colab import drive
drive.mount('/content/gdrive')
```

```
Drive already mounted at /content/gdrive; to attempt to forcibly remount, call drive.mount("/content/gdrive", force_remount=True).
```

```
data2 = pd.read_csv('gdrive/My Drive/DataBCA_5tahun.csv')


print(data2)
```

```
            Date     Month  Year  ...    Close    Adj Close      Volume
0     11/24/2014  November  2014  ...  13275.0  12520.87305  15453800.0
1     11/25/2014  November  2014  ...  13250.0  12497.29395  16735700.0
2     11/26/2014  November  2014  ...  13225.0  12473.71387   6002200.0
3     11/27/2014  November  2014  ...  13100.0  12355.81543  15265700.0
4     11/28/2014  November  2014  ...  13100.0  12355.81543   8120300.0
...          ...       ...   ...  ...      ...          ...         ...
1259  11/15/2019  November  2019  ...  31375.0  31375.00000   9427600.0
1260  11/18/2019  November  2019  ...      NaN          NaN         NaN
1261  11/19/2019  November  2019  ...  31575.0  31575.00000  12023000.0
1262  11/20/2019  November  2019  ...  31750.0  31750.00000   8645900.0
1263  11/21/2019  November  2019  ...  31500.0  31500.00000  11504700.0

[1264 rows x 9 columns]
```

```
data2['Date'] = pd.to_datetime(data2['Date'])
print(data2)
```

```
            Date     Month  Year  ...    Close    Adj Close      Volume
0     2014-11-24  November  2014  ...  13275.0  12520.87305  15453800.0
1     2014-11-25  November  2014  ...  13250.0  12497.29395  16735700.0
2     2014-11-26  November  2014  ...  13225.0  12473.71387   6002200.0
3     2014-11-27  November  2014  ...  13100.0  12355.81543  15265700.0
4     2014-11-28  November  2014  ...  13100.0  12355.81543   8120300.0
...          ...       ...   ...  ...      ...          ...         ...
1259  2019-11-15  November  2019  ...  31375.0  31375.00000   9427600.0
1260  2019-11-18  November  2019  ...      NaN          NaN         NaN
1261  2019-11-19  November  2019  ...  31575.0  31575.00000  12023000.0
1262  2019-11-20  November  2019  ...  31750.0  31750.00000   8645900.0
1263  2019-11-21  November  2019  ...  31500.0  31500.00000  11504700.0

[1264 rows x 9 columns]
```

```
data2 = data2.set_index('Date')

sns.set(rc={'figure.figsize':(8, 2)})

adj_close = data2['Adj Close']

data2.loc['2014': '2019', 'Adj Close'].plot(linewidth=0.5);
```


```
fig = plt.figure(figsize=(20,12))
fig.suptitle ('BBCA Stock price comparison 2014 - 2019')

ax1 = fig.add_subplot(231)
ax1.set_title('2014')
ax1 = data2.loc['2014', 'Adj Close'].plot()
ax1.set_ylabel('BBCA stock price in rupiah');

ax2 = fig.add_subplot(232)
ax2.set_title('2015')
ax2 = data2.loc['2015', 'Adj Close'].plot()
ax2.set_ylabel('BBCA stock price in rupiah');

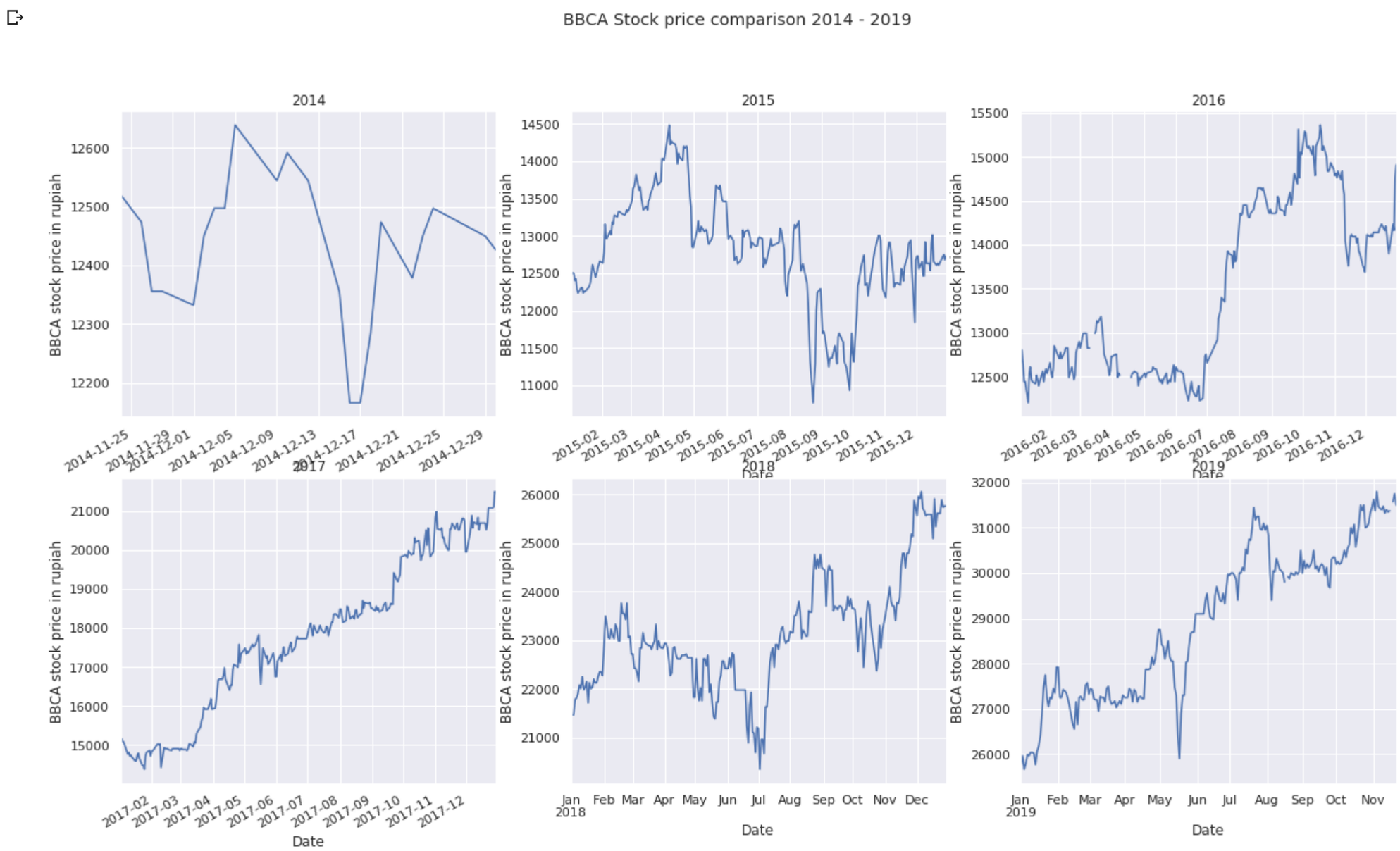
ax3 = fig.add_subplot(233)
ax3.set_title('2016')
ax3 = data2.loc['2016', 'Adj Close'].plot()
ax3.set_ylabel('BBCA stock price in rupiah');

ax4 = fig.add_subplot(234)
```

```
    ax4.set_title('2017')
    ax4 = data2.loc['2017', 'Adj Close'].plot()
    ax4.set_ylabel('BBCA stock price in rupiah');

    ax5 = fig.add_subplot(235)
    ax5.set_title('2018')
    ax5 = data2.loc['2018', 'Adj Close'].plot()
    ax5.set_ylabel('BBCA stock price in rupiah');

    ax6 = fig.add_subplot(236)
    ax6.set_title('2019')
    ax6 = data2.loc['2019', 'Adj Close'].plot()
    ax6.set_ylabel('BBCA stock price in rupiah');
```

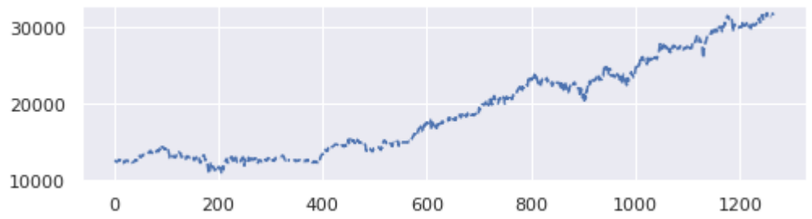



```
    adj close = data2['Adj Close']
```

```
time = np.linspace(1, len(adj_close), len(adj_close))

plt.plot(time, adj_close, label = '2014-2019', ls = '--')
```

```
[<matplotlib.lines.Line2D at 0x7fda1876bc18>]
```




```
print(data2)
```

```
                Month  Year     Open  ...    Close    Adj Close      Volume
Date                                  ...
2014-11-24  November  2014  13275.0  ...  13275.0  12520.87305  15453800.0
2014-11-25  November  2014  13250.0  ...  13250.0  12497.29395  16735700.0
2014-11-26  November  2014  13225.0  ...  13225.0  12473.71387   6002200.0
2014-11-27  November  2014  13100.0  ...  13100.0  12355.81543  15265700.0
2014-11-28  November  2014  13100.0  ...  13100.0  12355.81543   8120300.0
...              ...   ...      ...  ...      ...          ...         ...
2019-11-15  November  2019  31400.0  ...  31375.0  31375.00000   9427600.0
2019-11-18  November  2019      NaN  ...      NaN          NaN         NaN
2019-11-19  November  2019  31650.0  ...  31575.0  31575.00000  12023000.0
2019-11-20  November  2019  31275.0  ...  31750.0  31750.00000   8645900.0
2019-11-21  November  2019  31750.0  ...  31500.0  31500.00000  11504700.0

[1264 rows x 8 columns]
```

```
base_data = "Volume"
data_p= 10000000
data2["Prediksi"] = np.where(
      data2[base_data] >= data_p,"Positive","Negative")

print(data2["Prediksi"])
```

```
Date
2014-11-24    Positive
2014-11-25    Positive
2014-11-26    Negative
2014-11-27    Positive
2014-11-28    Negative
                ...
2019-11-15    Negative
2019-11-18    Negative
2019-11-19    Positive
2019-11-20    Negative
2019-11-21    Positive
Name: Prediksi, Length: 1264, dtype: object
```

```
n_o_d = 4
variable_array= ["Open","High","Low","Close"]
variable_array.append("Prediksi")
data2 = data2[variable_array].dropna(axis=0,how='any')


print(data2)
```

```
                Open     High      Low    Close  Prediksi
Date
2014-11-24  13275.0  13525.0  13225.0  13275.0  Positive
2014-11-25  13250.0  13325.0  13250.0  13250.0  Positive
2014-11-26  13225.0  13325.0  13225.0  13225.0  Negative
2014-11-27  13100.0  13325.0  13050.0  13100.0  Positive
2014-11-28  13100.0  13175.0  13025.0  13100.0  Negative
...             ...      ...      ...      ...       ...
2019-11-14  31325.0  31400.0  31050.0  31350.0  Negative
2019-11-15  31400.0  31450.0  31275.0  31375.0  Negative
2019-11-19  31650.0  31750.0  31500.0  31575.0  Positive
2019-11-20  31275.0  31750.0  31275.0  31750.0  Negative
2019-11-21  31750.0  31750.0  31500.0  31500.0  Positive

[1255 rows x 5 columns]
```

```
train, test = train_test_split(data2, test_size=0.6, random_state=int(4))
gnb = GaussianNB()
newarr = []
newarr.extend(variable_array)
newarr.remove("Prediksi")
```

```
gnb.fit(train[newarr].values, train["Prediksi"])
result = gnb.predict(test[newarr])


print(result)
```

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```

```
print("Number of mislabeled points out of a total {} points : {}, performance {:05.2f}%"
      .format(
          test.shape[0],
          (test["Prediksi"] != result).sum(),
          100*(1-(test["Prediksi"] != result).sum()/test.shape[0])
          ))

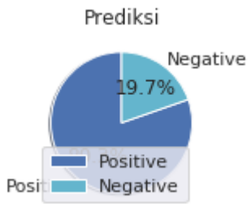
test_data = pd.concat([test[newarr], test["Prediksi"]], axis=1)
test_data["Prediksi"] = result
print (test_data)
```

```
Number of mislabeled points out of a total 753 points : 237, performance 68.53%
                Open     High      Low    Close  Prediksi
Date
2016-03-29  13175.0  13225.0  13075.0  13075.0  Positive
2016-02-01  13100.0  13225.0  12975.0  13225.0  Positive
2019-04-15  27800.0  27850.0  27450.0  27525.0  Negative
2015-10-29  13625.0  13725.0  13000.0  13150.0  Positive
2019-06-14  29225.0  29225.0  28950.0  29000.0  Negative
...             ...      ...      ...      ...       ...
2016-11-24  14500.0  14700.0  14400.0  14550.0  Positive
2018-05-22  21950.0  22100.0  21700.0  22000.0  Positive
2016-09-14  14950.0  15000.0  14800.0  14975.0  Positive
2018-05-08  22000.0  22025.0  21700.0  22025.0  Positive
2015-09-18  12100.0  12275.0  12050.0  12275.0  Positive

[753 rows x 5 columns]
```

```
counts = ct(result)
count_p = counts['Positive']
count_n = counts['Negative']

slices = [count_p,count_n]
cols = ['b','c']
plt.pie(slices, labels=['Positive','Negative'],colors = cols,shadow=True,startangle=90,autopct='%1.1f%%')
plt.title("Prediksi")
plt.legend()
plt.show()
```


Prediksi
Negative
19.7%
Positive
Negative
Posi