＋ Code ＋ Text

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

import warnings
warnings.filterwarnings('ignore')
# import chart_studio.plotly as py
# import plotly.graph_objs as go
# from plotly.offline import plot

# from plotly.offline import download_plotlyjs, iit_notebook_mode, plot , iplot
# init_notebook_mode(connected = True)
```

```
%matplotlib inline
```

```
!pip install plotly
!pip install chart_studio
```

```
Requirement already satisfied: plotly in /usr/local/lib/python3.10/dist-packages (5.15.0)
Requirement already satisfied: tenacity>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from plotly) (8.2.3)
Requirement already satisfied: packaging in /usr/local/lib/python3.10/dist-packages (from plotly) (23.2)
Collecting chart_studio
  Downloading chart_studio-1.1.0-py3-none-any.whl (64 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 64.4/64.4 kB 1.5 MB/s eta 0:00:00
Requirement already satisfied: plotly in /usr/local/lib/python3.10/dist-packages (from chart_studio) (5.15.0)
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from chart_studio) (2.31.0)
Collecting retrying>=1.3.3 (from chart_studio)
  Downloading retrying-1.3.4-py3-none-any.whl (11 kB)
Requirement already satisfied: six in /usr/local/lib/python3.10/dist-packages (from chart_studio) (1.16.0)
Requirement already satisfied: tenacity>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from plotly->chart_studio) (8.2.3)
Requirement already satisfied: packaging in /usr/local/lib/python3.10/dist-packages (from plotly->chart_studio) (23.2)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests->chart_studio
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests->chart_studio) (3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests->chart_studio) (2.0
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests->chart_studio) (202
Installing collected packages: retrying, chart_studio
Successfully installed chart_studio-1.1.0 retrying-1.3.4
```

```
!pip install plotly.offline
# !pip install
```

```
ERROR: Could not find a version that satisfies the requirement plotly.offline (from versions: none)
ERROR: No matching distribution found for plotly.offline
```

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

```
Mounted at /content/drive
```

```
df = pd.read_csv("/content/drive/MyDrive/stock_project.csv")
df.head()
```

	Date	Open	High	Low	Close	Adj Close	Volume
0	2018-02-05	262.000000	267.899994	250.029999	254.259995	254.259995	11896100
1	2018-02-06	247.699997	266.700012	245.000000	265.720001	265.720001	12595800
2	2018-02-07	266.579987	272.450012	264.329987	264.559998	264.559998	8981500
3	2018-02-08	267.079987	267.619995	250.000000	250.100006	250.100006	9306700
4	2018-02-09	253.850006	255.800003	236.110001	249.470001	249.470001	16906900

```
df.shape
# df.size
```

```
    (1009, 7)
```

```
df.isnull().sum()
```

```
    Date         0
    Open         0
    High         0
    Low          0
    Close        0
    Adj Close    0
    Volume       0
    dtype: int64
```

```
df.info()
```

```
    <class 'pandas.core.frame.DataFrame'>
    RangeIndex: 1009 entries, 0 to 1008
    Data columns (total 7 columns):
     #   Column     Non-Null Count  Dtype
    ---  ------     --------------  -----
     0   Date       1009 non-null   object
     1   Open       1009 non-null   float64
     2   High       1009 non-null   float64
     3   Low        1009 non-null   float64
     4   Close      1009 non-null   float64
     5   Adj Close  1009 non-null   float64
     6   Volume     1009 non-null   int64
    dtypes: float64(5), int64(1), object(1)
    memory usage: 55.3+ KB
```

```
df.describe()
```

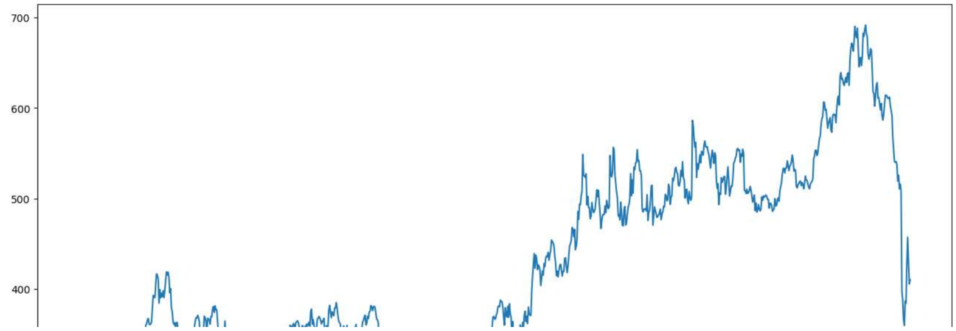
	Open	High	Low	Close	Adj Close	Volume
count	1009.000000	1009.000000	1009.000000	1009.000000	1009.000000	1.009000e+03
mean	419.059673	425.320703	412.374044	419.000733	419.000733	7.570685e+06
std	108.537532	109.262960	107.555867	108.289999	108.289999	5.465535e+06
min	233.919998	250.649994	231.229996	233.880005	233.880005	1.144000e+06
25%	331.489990	336.299988	326.000000	331.619995	331.619995	4.091900e+06
50%	377.769989	383.010010	370.880005	378.670013	378.670013	5.934500e+06
75%	509.130005	515.630005	502.529999	509.079987	509.079987	9.322400e+06
max	692.349976	700.989990	686.090027	691.690002	691.690002	5.890430e+07

```
df.columns
```

```
    Index(['Date', 'Open', 'High', 'Low', 'Close', 'Adj Close', 'Volume'], dtype='object')
```

```
plt.figure(figsize = (16,8))
plt.plot(df['Close'], label = 'Closing Price')
```

```
[<matplotlib.lines.Line2D at 0x7a065ad854e0>]
```



```
df['open - close'] = df['Open'] - df['Close']
df['High - Low'] = df['High'] - df['Low']
df = df.dropna()
```

```
x = df[['open - close','High - Low' ]]
x.head()
```

	open - close	High - Low
0	7.740005	17.869995
1	-18.020004	21.700012
2	2.019989	8.120025
3	16.979981	17.619995
4	4.380005	19.690002

```
y = np.where(df['Close'].shift(-1) > df['Close'],1,-1)
```

```
y
```

```
array([ 1, -1, -1, ..., -1,  1, -1])
```

```
# prompt: split the data ito train, test set
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size = 0.25, random_state = 42)
```

```
# from sklearn.model_selection import train_test_split
# x_train, x_test, y_train, y_test = train_test_split(x, y, test_size =0, random_state = 44)
```

Generate Using ... import kneighborsclassifers, neighbors, gridsearchcv, accuracy_score from sklearn Close

< 1 of 3 > Undo changes Use code with caution

```
# prompt: import kneighborsclassifers, neighbors, gridsearchcv, accuracy_score from sklearn
from sklearn.neighbors import KNeighborsClassifier
from sklearn import neighbors
from sklearn.model_selection import GridSearchCV
from sklearn.metrics import accuracy_score
```

```
prediction_classificatio = model.predict(x_test)
actual_predicted_data = pd.DataFrame({'Actual Class': y_test, 'Prediction Class': prediction_classificatio })
knn = neighbors.KNeighborsClassifier()
```

```
actual_predicted_data.head(10)
```

	Actual Class	Prediction Class
0	-1	-1
1	-1	1
2	-1	-1
3	-1	1
4	-1	1
5	1	-1
6	-1	1
7	1	-1
8	-1	-1
9	-1	-1

```
y = df['Close']
y
```

```
0       254.259995
1       265.720001
2       264.559998
3       250.100006
4       249.470001
           ...
1004    427.140015
1005    457.130005
1006    429.480011
1007    405.600006
1008    410.170013
Name: Close, Length: 1009, dtype: float64
```

```
from sklearn.neighbors import KNeighborsClassifier
from sklearn import neighbors

x_train_reg, x_test_reg, y_train_reg, y_test_reg = train_test_split(x, y, test_size = 0.25)

params = {"n_neighbors" : [2,3,4,5,6,7,8,9,10,11,12,13,14,15]}
knn_reg = neighbors.KNeighborsRegressor()
model_reg = GridSearchCV(knn_reg, params, cv=5)

model_reg.fit(x_train_reg, y_train_reg )
predictions = model_reg.predict(x_test_reg)
```

```
print(predictions)
```

```
[433.44866533 360.91933593 398.54199833 463.35667313 401.60333253
 453.71866667 436.83666587 376.27600307 437.91333207 498.80199787
 413.5373352  489.74932867 429.169338   366.4800008  374.54399627
 404.28599847 423.4613342  414.57866407 346.31599527 414.8273316
 438.8099976  468.08666173 418.35599773 436.96400147 433.06933587
 392.9873312  447.98333233 406.40933627 351.95399993 396.43466787
 377.7526712  352.7713298  434.15333447 423.1373332  461.43799647
 496.4713358  330.4253336  467.23333133 363.20999347 365.01066707
 412.40133067 422.89667147 428.78466593 427.5319966  484.20666907
 374.3786642  452.3593342  409.41399933 470.60800173 397.14733887
 425.38399873 476.5926676  415.78732913 362.25000007 389.40600593
 347.71266887 318.3866638  445.27999873 420.80467333 453.6906656
 478.38733313 387.84066987 413.02266653 438.80732627 453.8126668
 434.9026632  435.76733187 403.44600027 422.60066947 337.71599527
 417.70533253 426.36333213 487.8440022  437.28067227 351.52266853
 440.9339986  416.6493328  437.9473348  374.1513346  438.42399893
 417.66200153 448.90133253 445.07933447 451.71800133 416.79333693
 454.64466953 363.6539978  419.96866853 361.0720012  437.2386658
 428.1819978  358.8360006  432.64133293 418.89666767 369.20999967
 376.2466694  471.336672   384.61799107 449.84866533 389.1986694
 489.35599967 374.20932607 467.7046692  461.45466307 439.23667193
 433.77132987 432.4626588  370.9880046  359.33800253 330.0839966
 492.9573374  429.20866493 366.7620016  430.8806682  459.57199907
 360.94400213 460.03466993 445.60199793 435.40799967 457.65333247
 384.83933107 452.40266713 427.44666953 372.41600347 356.8433308
 359.4719992  357.3646688  383.00067347 458.6540038  458.5533346
 373.44332673 417.06666667 457.25132853 370.39799613 429.36466887
 450.59066967 442.99266553 402.31866847 366.2973348  434.9926636
 352.389329   451.84200447 464.65733447 450.84933667 393.87267053
 391.99999393 407.54400027 380.1626688  384.90866707 476.96800753
 427.393333   432.5700034  401.59599807 454.81399733 449.20333047
 371.91599933 434.3559998  416.79333693 440.66600333 414.3733316
 475.00666707 460.5300008  447.64133507 387.90399793 474.47600507
 390.5013408  439.519334   384.36399733 367.31266887 463.5013336
 434.01999827 435.91399933 443.98399053 455.55332953 378.12866
 396.308669   355.7813332  479.34266567 491.90266527 401.60333253
 451.06333213 441.0380046  356.85666713 452.36533607 358.05999767
 490.98866373 344.0493348  448.89799793 378.515332   342.50533447
 386.8186626  372.1380026  438.68333547 382.05133247 500.88533327
 389.69400213 458.9986654  355.4319926  381.43799447 417.02333587
 451.17267047 407.61466853 375.65266527 365.83133547 422.826001
 397.8693298  476.282662   480.0946736  372.49666547 393.2820048
 404.00666713 429.06200053 446.21199847 411.2946696  363.06532587
 363.24533493 408.86599533 421.61267087 397.239335   353.2206686
 418.35599773 473.43599647 383.30400387 358.47600107 450.56934007
 461.94800207 432.64133293 445.67667027 433.71533207 502.9006734
 330.21999713 443.27933953 385.13733933 354.0360006  384.90866707
 468.46133633 444.51466887 427.44666953 405.20533047 357.93999833
 394.16133427 407.30533847 431.4113342  409.41467067 413.1706624
 453.38600667 430.7700012  391.3620036  476.5926676  354.9080018
 366.2973348  422.23932707 383.858667  ]
```

```
rms = np.sqrt(np.mean(np.power((np.array(y_test)-np.array(predictions)),2)))
rms
```

```
418.05058096854907
```

```
valid = pd.DataFrame({'Actual Close': y_test_reg, 'Predicted Close value': predictions})
```

```
valid.head(10)
```

	Actual Close	Predicted Close value
119	363.089996	433.448665
391	294.980011	360.919336
595	447.769989	398.541998
710	490.700012	463.356673
126	350.920013	401.603333
816	503.179993	453.718667
794	539.419983	436.836666
757	547.919983	376.276003
419	272.790009	437.913332
614	523.260010	498.801998