In [1]:
```
import pandas as pd
```

In [2]:
```
import numpy as np
```

In [3]:
```
from sklearn.neighbors import KNeighborsClassifier
from sklearn.preprocessing import StandardScaler
from sklearn.model_selection import train_test_split, GridSearchCV
from sklearn.model_selection import KFold
from statsmodels.stats.outliers_influence import variance_inflation_factor
from sklearn.metrics import accuracy_score, confusion_matrix, roc_curve, roc_auc_
import matplotlib.pyplot as plt
import seaborn as sns
sns.set()
```

In [12]:
```
import chart_studio.plotly as py
```

In [14]:
```
import plotly.graph_objs as go
from plotly.offline import plot
```

In [27]:
```
# for offline plotting

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

In [5]:
```
data = pd.read_csv('stock_price.csv')
```

In [6]:
```
data.head()
```

Out[6]:

	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

In [7]:
```
data.tail()
```

Out[7]:

	Date	Open	High	Low	Close	Adj Close	Volume
1004	2022-01-31	401.970001	427.700012	398.200012	427.140015	427.140015	20047500
1005	2022-02-01	432.959991	458.480011	425.540009	457.130005	457.130005	22542300
1006	2022-02-02	448.250000	451.980011	426.480011	429.480011	429.480011	14346000
1007	2022-02-03	421.440002	429.260010	404.279999	405.600006	405.600006	9905200
1008	2022-02-04	407.309998	412.769989	396.640015	410.170013	410.170013	7782400

In [9]:
```
data.shape
```

Out[9]:
```
(1009, 7)
```

hence we can say there are no missing values in the data

In [11]:
```
data.isnull().sum()    # no null values exists
```

Out[11]:
```
Date         0
Open         0
High         0
Low          0
Close        0
Adj Close    0
Volume       0
dtype: int64
```

In [16]:
```
data.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
```

In [17]:
```
# now we are converting date column into date-time format using pandas library ar
```

In [18]:
```
data['Date'] = pd.to_datetime(data['Date'])
```

In [19]:
```
print(f'DataFrame contains stock prices between {data.Date.min()} {data.Date.max(
```

```
DataFrame contains stock prices between 2018-02-05 00:00:00 2022-02-04 00:00:00
```

In [20]:
```
print(f' Total Days = {(data.Date.max() - data.Date.min()).days} days')
```

```
 Total Days = 1460 days
```

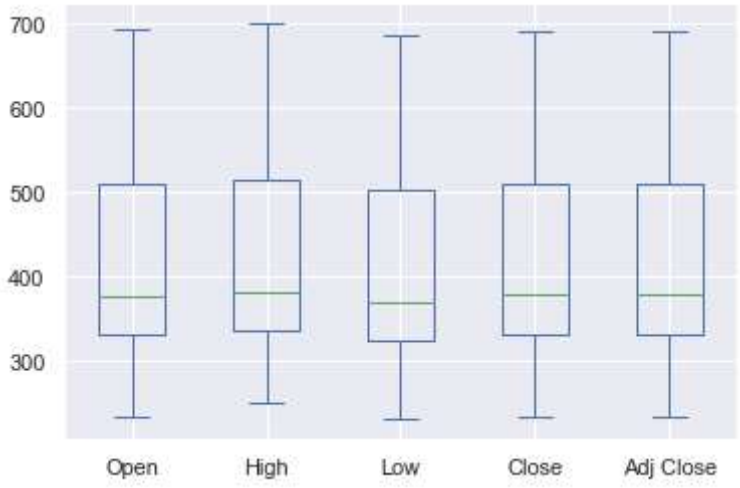
In [21]:
```
data.describe()
```

Out[21]:

	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

In [22]:
```
data[['Open','High','Low','Close','Adj Close']].plot(kind='box')
```

Out[22]:
```
<AxesSubplot:>
```

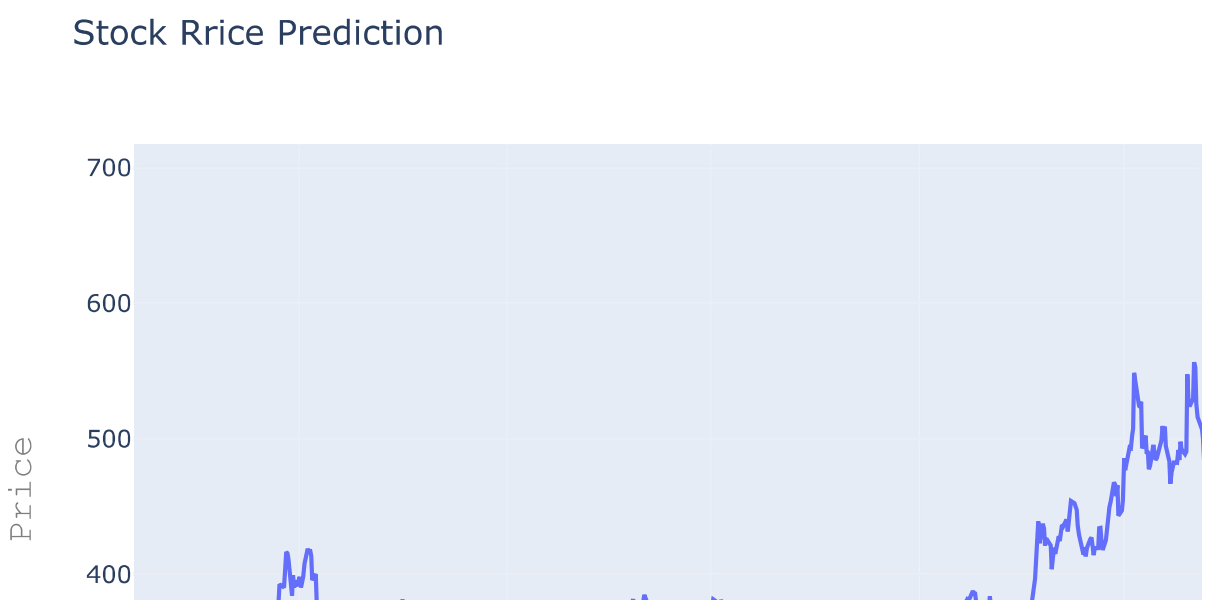


In [24]:
```
# setting the layout for our plot
layout = go.Layout(
    title = 'Stock Rrice Prediction',
    xaxis= dict(
        title = 'Date',
        titlefont=dict(
            family = 'Courier New, monospace',
            size = 18,
            color ='#7f7f7f'
        )
    ),
    yaxis = dict(
        title='Price',
        titlefont=dict(
            family='Courier New, monospace',
            size = 18,
            color ='#7f7f7f'
        )
    )
)

stock_data = [{'x':data['Date'],'y':data['Close']}]
plot = go.Figure(data= stock_data,layout=layout)
```

In [26]:
```
# plotting offline now

iplot(plot)
```



##from the graph we can observe that during jul-2018 to jan-2020 the stock prices are not as much as expected. But from jul 2020 the stock prices grew higher

Now building the regression model

In [28]:
```
# for preprocessing

from sklearn.preprocessing import MinMaxScaler
from sklearn.preprocessing import StandardScaler
```

In [29]:
```
# for model evaluation
from sklearn.metrics import mean_squared_error as mse
from sklearn.metrics import r2_score
```

In [30]:
```
# now split the data into train and test sets

x = np.array(data.index).reshape(-1,1)
y = data['Close']
```

In [31]:
```
x_train,x_test,y_train,y_test = train_test_split(x,y, test_size = 0.3, random_sta
```

In [32]:
```
# now feature scaling
```

In [33]:
```
scaler = StandardScaler()
```

In [34]:
```
x_scaled = scaler.fit(x_train)
```

In [35]:
```
from sklearn.linear_model import LinearRegression
```

In [36]:
```
# creating linear model

lm = LinearRegression()
lm.fit(x_train,y_train)
```

Out[36]:
```
LinearRegression()
```

In [37]:
```
# plotting actual and predicted values for train dataset
```

In [38]:
```
trace0 = go.Scatter(
    x = x_train.T[0],
    y = y_train,
    mode = 'markers',
    name = 'Actual'
)
trace1 = go.Scatter(
    x = x_train.T[0],
    y = lm.predict(x_train).T,
    mode = 'lines',
    name = 'Predicted'
)
stock_data = [trace0,trace1]
layout.xaxis.title.text = 'Day'
plot2 = go.Figure(data=stock_data, layout = layout)
```

In [39]:
```
iplot(plot2)
```

In [40]:
```
# calculate scores for evaluating our mode
```

In [41]:
```
scores = f'''
{'Metric'.ljust(10)}{'Train'.center(20)}{'Test'.center(20)}
{'r2_score'.ljust(10)}{r2_score(y_train, lm.predict(x_train))}\t{r2_score(y_test,
{'MSE'.ljust(10)}{mse(y_train, lm.predict(x_train))}\t{mse(y_test, lm.predict(x_t
'''

print(scores)
```

```
Metric           Train                Test
r2_score  0.7211106305195711    0.6795754604970445
MSE       3198.948905103629     3935.293508785703
```

In [ ]:
```

```