Stock_Market_Prediction

April 30, 2023

0.1 STOCK MARKET PREDICTION

Importing the libraries

[ ]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

[ ]:
```
from sklearn import preprocessing
from sklearn.ensemble import RandomForestRegressor
from sklearn.model_selection import train_test_split
from matplotlib import style
style.use("fivethirtyeight")
```

Read the csv file into a DataFrame

[ ]:
```
df = pd.read_csv(r"tesla.csv")
```

[ ]:
```
df.head(10)
```

[ ]:

	Date	Open	High	Low	Close	Volume	Adj Close
0	6/29/2010	19.000000	25.000000	17.540001	23.889999	18766300	23.889999
1	6/30/2010	25.790001	30.420000	23.299999	23.830000	17187100	23.830000
2	7/1/2010	25.000000	25.920000	20.270000	21.959999	8218800	21.959999
3	7/2/2010	23.000000	23.100000	18.709999	19.200001	5139800	19.200001
4	7/6/2010	20.000000	20.000000	15.830000	16.110001	6866900	16.110001
5	7/7/2010	16.400000	16.629999	14.980000	15.800000	6921700	15.800000
6	7/8/2010	16.139999	17.520000	15.570000	17.459999	7711400	17.459999
7	7/9/2010	17.580000	17.900000	16.549999	17.400000	4050600	17.400000
8	7/12/2010	17.950001	18.070000	17.000000	17.049999	2202500	17.049999
9	7/13/2010	17.389999	18.639999	16.900000	18.139999	2680100	18.139999

[ ]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1692 entries, 0 to 1691
Data columns (total 7 columns):
 #   Column     Non-Null Count  Dtype
---  ------     --------------  -----
```

```
 0   Date       1692 non-null   object
 1   Open       1692 non-null   float64
 2   High       1692 non-null   float64
 3   Low        1692 non-null   float64
 4   Close      1692 non-null   float64
 5   Volume     1692 non-null   int64
 6   Adj Close  1692 non-null   float64
dtypes: float64(5), int64(1), object(1)
memory usage: 92.7+ KB
```

[ ]:
```
df.dtypes
```

[ ]:
```
Date          object
Open         float64
High         float64
Low          float64
Close        float64
Volume         int64
Adj Close    float64
dtype: object
```

Make two new columns which will be used for making predictions.

[ ]:
```
df["HL_Perc"] = (df["High"]-df["Low"]) / df["Low"] * 100
df["CO_Perc"] = (df["Close"] - df["Open"]) / df["Open"] * 100
```

[ ]:
```
dates = np.array(df["Date"])
dates_check = dates[-30:]
dates = dates[:-30]
```

[ ]:
```
df = df[["HL_Perc", "CO_Perc", "Adj Close", "Volume"]]
```

Define the label column

[ ]:
```
df["PriceNextMonth"] = df["Adj Close"].shift(-30)
```

[ ]:
```
df.tail(10)
```

[ ]:

	HL_Perc	CO_Perc	Adj Close	Volume	PriceNextMonth
1682	1.692862	1.331129	251.210007	3351200	NaN
1683	2.243070	-1.321849	248.589996	3449200	NaN
1684	1.936246	-0.052634	246.869995	3725200	NaN
1685	2.329220	-1.102456	244.899994	3861500	NaN
1686	1.440329	-1.023519	243.690002	3057000	NaN
1687	1.676418	0.551422	246.169998	3010700	NaN
1688	4.918296	4.831173	258.000000	7575500	NaN
1689	2.646791	-0.494165	255.729996	4816600	NaN
1690	2.582414	-0.133386	262.049988	7100400	NaN

```
1691   1.581154 -0.946970   261.500000   6475900              NaN
```

Make fetaure and label arrays

[ ]:
```
X = np.array(df.drop(["PriceNextMonth"], 1))
X = preprocessing.scale(X)
X_Check = X[-30:]
X = X[:-30]
df.dropna(inplace = True)
y = np.array(df["PriceNextMonth"])
```

```
<ipython-input-14-383e8e913f7f>:1: FutureWarning: In a future version of pandas
all arguments of DataFrame.drop except for the argument 'labels' will be
keyword-only.
  X = np.array(df.drop(["PriceNextMonth"], 1))
```

Divide the data set into training data and testing data

[ ]:
```
X_train, X_test, y_train, y_test = train_test_split(X,y,test_size = 0.2)
```

Define the prediction model

[ ]:
```
model = RandomForestRegressor()
```

Fit the model using training data

[ ]:
```
model.fit(X_train, y_train)
```

[ ]:
```
RandomForestRegressor()
```

Calculate the confidence value by applying the model to testing data

[ ]:
```
conf = model.score(X_test, y_test)
print(conf)
```

```
0.9599554504935848
```

Fit the model again using the whole data set

[ ]:
```
model.fit(X,y)
```

[ ]:
```
RandomForestRegressor()
```

[ ]:
```
predictions = model.predict(X_Check)
```

Make the final DataFrame containing Dates, ClosePrices, and Forecast values

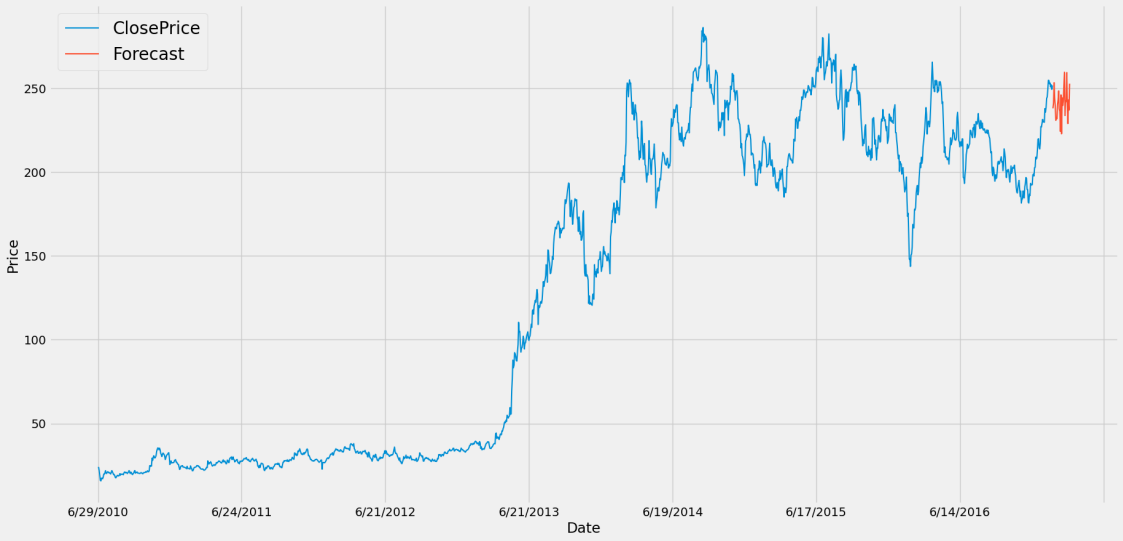
[ ]:
```
actual = pd.DataFrame(dates, columns = ["Date"])
actual["ClosePrice"] = df["Adj Close"]
actual["Forecast"] = np.nan
```

```
actual.set_index("Date", inplace = True)
forecast = pd.DataFrame(dates_check, columns=["Date"])
forecast["Forecast"] = predictions
forecast["ClosePrice"] = np.nan
forecast.set_index("Date", inplace = True)
var = [actual, forecast]
result = pd.concat(var)
```

Plotting the final results

[ ]:
```
result.plot(figsize=(20,10), linewidth=1.5)
plt.legend(loc=2, prop={'size':20})
plt.xlabel('Date')
plt.ylabel('Price')
```

[ ]:
```
Text(0, 0.5, 'Price')
```



[ ]: