```python
from  fbprophet import Prophet
import pandas as pd
import datetime as dt
import matplotlib.pyplot as plt
import pandas_datareader.data as reader
```

```python
!pip install --upgrade pandas
```

```
Requirement already satisfied: pandas in /usr/local/lib/python3.7/dist-packages (1.3.1)
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.7/dist-packages (from panda
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-packages (from panda:
Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.7/dist-packages (-
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (from python-da-
```

```python
!pip install --upgrade pandas-datareader
```

```
Requirement already satisfied: pandas-datareader in /usr/local/lib/python3.7/dist-packages (0.10.(
Requirement already satisfied: pandas>=0.23 in /usr/local/lib/python3.7/dist-packages (from panda:
Requirement already satisfied: requests>=2.19.0 in /usr/local/lib/python3.7/dist-packages (from pi
Requirement already satisfied: lxml in /usr/local/lib/python3.7/dist-packages (from pandas-datarea
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-packages (from panda:
Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.7/dist-packages (-
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.7/dist-packages (from panda
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (from python-da-
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.7/dist-packages (from reque:
Requirement already satisfied: urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in /usr/local/lib/python3.]
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.7/dist-packages (from
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.7/dist-packages (from
```
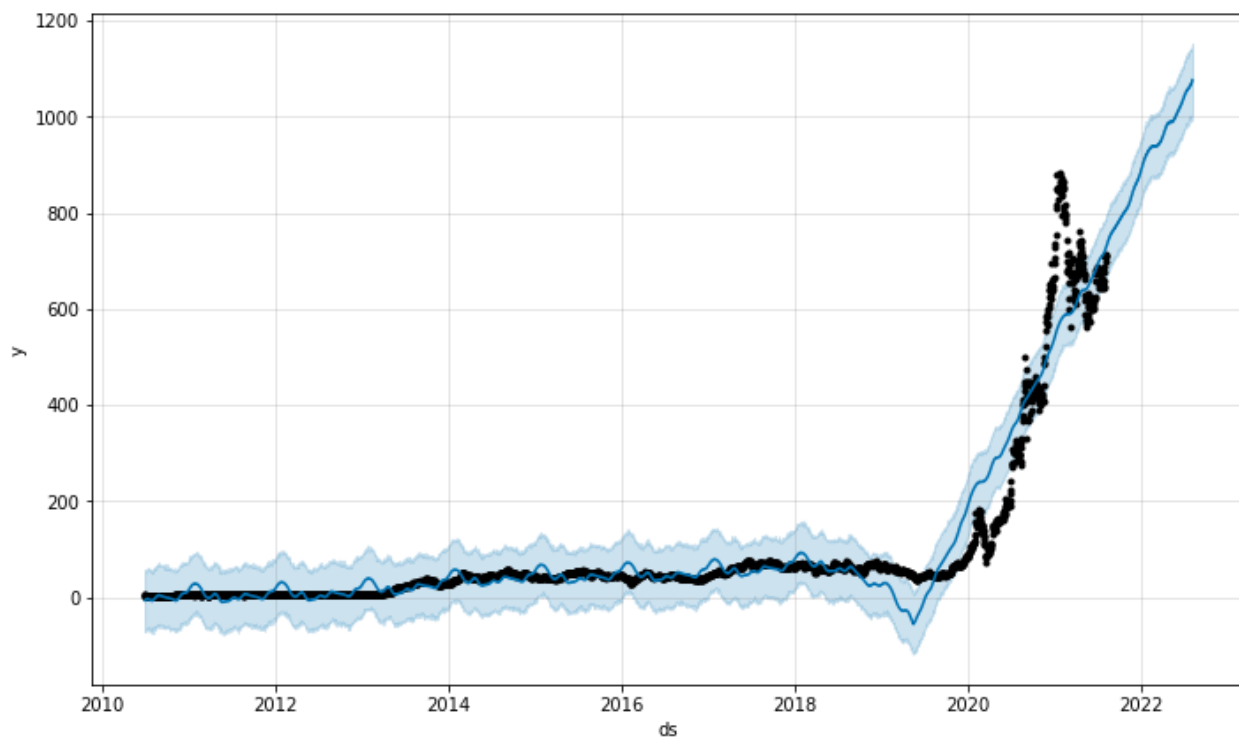
```python
end=dt.datetime.now()
start="07-01-2003"
df= reader.get_data_yahoo('TSLA',start,end)
df=df.reset_index()
```

```python
model=Prophet()
df[['ds','y']]=df[['Date','Adj Close']]
model.fit(df)
df
```

	Date	High	Low	Open	Close	Volume	Adj Close
0	2010-06-29	5.000000	3.508000	3.800000	4.778000	93831500.0	4.778000
1	2010-06-30	6.084000	4.660000	5.158000	4.766000	85935500.0	4.766000
2	2010-07-01	5.184000	4.054000	5.000000	4.392000	41094000.0	4.392000
3	2010-07-02	4.620000	3.742000	4.600000	3.840000	25699000.0	3.840000

```
future=model.make_future_dataframe(periods=365)
forecast=model.predict(future)
model.plot(forecast)
plt.show()
```



```
!pip install --upgrade pandas
```

```
Requirement already satisfied: pandas in /usr/local/lib/python3.7/dist-packages (1
Collecting pandas
  Downloading pandas-1.3.1-cp37-cp37m-manylinux_2_17_x86_64.manylinux2014_x86_64.w
     |████████████████████████████████| 11.5 MB 7.0 MB/s
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.7/dist-pack
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-packa
Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.7/
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages
Installing collected packages: pandas
  Attempting uninstall: pandas
    Found existing installation: pandas 1.1.5
    Uninstalling pandas-1.1.5:
      Successfully uninstalled pandas-1.1.5
ERROR: pip's dependency resolver does not currently take into account all the pack
```

`forecast.tail(365)`

	ds	trend	yhat_lower	yhat_upper	trend_lower	trend_upper	addit:
2797	2021-08-07	734.378879	663.026557	793.314607	734.378879	734.378879	
2798	2021-08-08	735.333070	662.228275	795.260134	735.333070	735.333070	
2799	2021-08-09	736.287260	667.747910	796.264319	736.287260	736.287260	
2800	2021-08-10	737.241451	667.828408	795.553782	737.241451	737.241451	
2801	2021-08-11	738.195641	674.112098	799.464819	738.195641	738.195641	
...	...	...	...	...	...	...	
3157	2022-08-02	1077.887426	991.485640	1142.662156	1044.383884	1114.629514	
3158	2022-08-03	1078.841617	996.391919	1142.409940	1045.230496	1115.846225	
3159	2022-08-04	1079.795807	1001.650458	1144.946725	1046.035744	1117.062936	
3160	2022-08-05	1080.749998	1000.991071	1147.832174	1046.838490	1118.190892	
3161	2022-08-06	1081.704188	1005.625208	1151.729653	1047.647938	1119.291748	

365 rows × 19 columns

```
import statsmodels.api  as sm
```

```
/usr/local/lib/python3.7/dist-packages/statsmodels/tools/_testing.py:19: FutureWarning:

pandas.util.testing is deprecated. Use the functions in the public API at pandas.testing instead.
```

```
start1='08-19-2004'
Input=['GOOGL','^GSPC']
df1=reader.get_data_yahoo(Input,start1,end)['Adj Close']

df1
```

Symbols	GOOGL	^GSPC
Date		
2004-08-19	50.220219	1091.229980
2004-08-20	54.209209	1098.349976
2004-08-23	54.754753	1095.680054
2004-08-24	52.487488	1096.189941
2004-08-25	53.053055	1104.959961
...	...	...
2021-08-02	2697.090088	4387.160156
2021-08-03	2712.600098	4423.149902
2021-08-04	2702.510010	4402.660156
2021-08-05	2725.030029	4429.100098
2021-08-06	2714.770020	4436.520020

4272 rows × 2 columns

```
met_ret = df1.resample('M').ffill().pct_change()
met_ret=met_ret.dropna(axis=0)
met_ret
```

Symbols	GOOGL	^GSPC
Date		
2004-09-30	0.265996	0.009364
2004-10-31	0.470988	0.014014

```
x=met_ret['^GSPC']
y=met_ret['GOOGL']
x_sm=sm.add_constant(x)
model1=sm.OLS(y,x_sm)
result=model1.fit()
result.summary()
```

/usr/local/lib/python3.7/dist-packages/statsmodels/tsa/tsatools.py:117: FutureWarn

In a future version of pandas all arguments of concat except for the argument 'obj

OLS Regression Results

Dep. Variable:	GOOGL	**R-squared:**	0.247
Model:	OLS	**Adj. R-squared:**	0.244
Method:	Least Squares	**F-statistic:**	66.36
Date:	Sat, 07 Aug 2021	**Prob (F-statistic):**	3.85e-14
Time:	07:44:08	**Log-Likelihood:**	234.61
No. Observations:	204	**AIC:**	-465.2
Df Residuals:	202	**BIC:**	-458.6
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	0.0152	0.005	2.770	0.006	0.004	0.026
^GSPC	1.0555	0.130	8.146	0.000	0.800	1.311

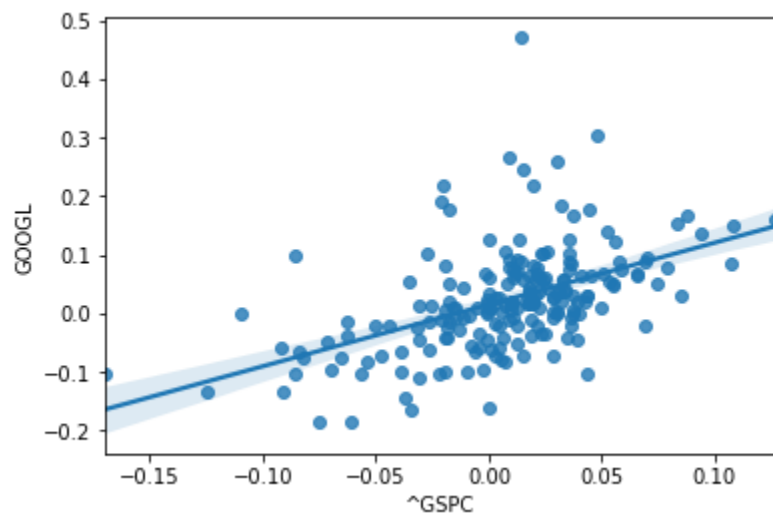|			
Omnibus:	84.415	**Durbin-Watson:**	1.801
Prob(Omnibus):	0.000	**Jarque-Bera (JB):**	377.536
Skew:	1.579	**Prob(JB):**	1.05e-82
Kurtosis:	8.869	**Cond. No.**	24.0

Warnings:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

```
import seaborn as sns
sns.regplot(x='^GSPC',y='GOOGL',data=met_ret)
```

<matplotlib.axes._subplots.AxesSubplot at 0x7fb288e5fc10>

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