

```
In [1]: !pip install yfinance --upgrade  
        !pip install prophet
```

Requirement already satisfied: yfinance in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (0.2.21)

Collecting yfinance

Downloading yfinance-0.2.24-py2.py3-none-any.whl (63 kB)

63.1/63.1 kB 154.2 kB/s eta 0:

00:00 0:00:01

Requirement already satisfied: requests>=2.26 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (2.28.0)

Requirement already satisfied: appdirs>=1.4.4 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (1.4.4)

Requirement already satisfied: beautifulsoup4>=4.11.1 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (4.11.1)

Requirement already satisfied: frozendict>=2.3.4 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (2.3.8)

Requirement already satisfied: lxml>=4.9.1 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (4.9.2)

Requirement already satisfied: pytz>=2022.5 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (2023.3)

Requirement already satisfied: multitasking>=0.0.7 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (0.0.11)

Requirement already satisfied: html5lib>=1.1 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (1.1)

Requirement already satisfied: pandas>=1.3.0 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (2.0.3)

Requirement already satisfied: numpy>=1.16.5 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from yfinance) (1.25.0)

Requirement already satisfied: soupsieve>1.2 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from beautifulsoup4>=4.11.1->yfinance) (2.3.2.post1)

Requirement already satisfied: six>=1.9 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from html5lib>=1.1->yfinance) (1.16.0)

Requirement already satisfied: webencodings in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from html5lib>=1.1->yfinance) (0.5.1)

Requirement already satisfied: python-dateutil>=2.8.2 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from pandas>=1.3.0->yfinance) (2.8.2)

Requirement already satisfied: tzdata>=2022.1 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from pandas>=1.3.0->yfinance) (2023.3)

Requirement already satisfied: idna<4,>=2.5 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from requests>=2.26->yfinance) (3.3)

Requirement already satisfied: certifi>=2017.4.17 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from requests>=2.26->yfinance) (2022.6.15)

Requirement already satisfied: charset-normalizer~2.0.0 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from requests>=2.26->yfinance) (2.0.12)

Requirement already satisfied: urllib3<1.27,>=1.21.1 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from requests>=2.26->yfinance) (1.26.9)

Installing collected packages: yfinance

Attempting uninstall: yfinance

Found existing installation: yfinance 0.2.21

Uninstalling yfinance-0.2.21:

Successfully uninstalled yfinance-0.2.21

Successfully installed yfinance-0.2.24

Collecting prophet

Downloading prophet-1.1.4-py3-none-macosx_10_9_x86_64.whl (7.2 MB)

7.2/7.2 MB ? eta 0:00:00:00:

0100:01

Requirement already satisfied: pandas>=1.0.4 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from prophet) (2.0.3)

Requirement already satisfied: numpy>=1.15.4 in /Users/manikshakya/anaconda3/envs/hgp/lib/python3.10/site-packages (from prophet) (1.25.0)

```
Collecting importlib-resources
  Downloading importlib_resources-6.0.0-py3-none-any.whl (31 kB)
Collecting convertdate>=2.1.2
  Downloading convertdate-2.4.0-py3-none-any.whl (47 kB)
  _____ 47.9/47.9 kB 132.5 kB/s eta 0:
00:00 0:00:01
Requirement already satisfied: tqdm>=4.36.1 in /Users/manikshakya/anaconda3/
envs/hgp/lib/python3.10/site-packages (from prophet) (4.65.0)
Collecting LunarCalendar>=0.0.9
  Downloading LunarCalendar-0.0.9-py2.py3-none-any.whl (18 kB)
Collecting cmdstanpy>=1.0.4
  Downloading cmdstanpy-1.1.0-py3-none-any.whl (83 kB)
  _____ 83.2/83.2 kB 103.7 kB/s eta 0:
00:0000:01
Collecting holidays>=0.25
  Downloading holidays-0.28-py3-none-any.whl (642 kB)
  _____ 642.9/642.9 kB 1.8 MB/s eta 0:
00:0000:01
Requirement already satisfied: matplotlib>=2.0.0 in /Users/manikshakya/anaco
nda3/envs/hgp/lib/python3.10/site-packages (from prophet) (3.7.1)
Requirement already satisfied: python-dateutil>=2.8.0 in /Users/manikshakya/
anaconda3/envs/hgp/lib/python3.10/site-packages (from prophet) (2.8.2)
Collecting pymeeus<=1,>=0.3.13
  Downloading PyMeeus-0.5.12.tar.gz (5.8 MB)
  _____ 5.8/5.8 MB 258.0 kB/s eta 0:0
0:00:0100:01m
  Preparing metadata (setup.py) ... done
Requirement already satisfied: pytz in /Users/manikshakya/anaconda3/envs/hg
p/lib/python3.10/site-packages (from LunarCalendar>=0.0.9->prophet) (2023.3)
Collecting ephemeris>=3.7.5.3
  Downloading ephemeris-4.1.4-cp310-cp310-macosx_10_9_x86_64.whl (1.4 MB)
  _____ 1.4/1.4 MB 331.6 kB/s eta 0:0
0:0000:0100:01
Requirement already satisfied: pyparsing>=2.3.1 in /Users/manikshakya/anaco
nda3/envs/hgp/lib/python3.10/site-packages (from matplotlib>=2.0.0->prophet)
(3.0.9)
Requirement already satisfied: fonttools>=4.22.0 in /Users/manikshakya/anaco
nda3/envs/hgp/lib/python3.10/site-packages (from matplotlib>=2.0.0->prophet)
(4.33.3)
Requirement already satisfied: kiwisolver>=1.0.1 in /Users/manikshakya/anaco
nda3/envs/hgp/lib/python3.10/site-packages (from matplotlib>=2.0.0->prophet)
(1.4.3)
Requirement already satisfied: pillow>=6.2.0 in /Users/manikshakya/anaconda
3/envs/hgp/lib/python3.10/site-packages (from matplotlib>=2.0.0->prophet)
(9.1.1)
Requirement already satisfied: contourpy>=1.0.1 in /Users/manikshakya/anaco
nda3/envs/hgp/lib/python3.10/site-packages (from matplotlib>=2.0.0->prophet)
(1.1.0)
Requirement already satisfied: cycycler>=0.10 in /Users/manikshakya/anaconda3/
envs/hgp/lib/python3.10/site-packages (from matplotlib>=2.0.0->prophet) (0.1
1.0)
Requirement already satisfied: packaging>=20.0 in /Users/manikshakya/anacond
a3/envs/hgp/lib/python3.10/site-packages (from matplotlib>=2.0.0->prophet)
(21.3)
Requirement already satisfied: tzdata>=2022.1 in /Users/manikshakya/anaconda
3/envs/hgp/lib/python3.10/site-packages (from pandas>=1.0.4->prophet) (2023.
3)
Requirement already satisfied: six>=1.5 in /Users/manikshakya/anaconda3/env
s/hgp/lib/python3.10/site-packages (from python-dateutil>=2.8.0->prophet)
(1.16.0)
Building wheels for collected packages: pymeeus
  Building wheel for pymeeus (setup.py) ... done
  Created wheel for pymeeus: filename=PyMeeus-0.5.12-py3-none-any.whl size=7
32001 sha256=2120d443fbd6cbf1488e9875703ebe5b95c2f3fe423c5672a72393f7bf8dcee
```

2

Stored in directory: /Users/manikshakya/Library/Caches/pip/wheels/d6/67/78/aa2e8d108639dd23a5e9e72a4fc88bb44f5541894382712f48
 Successfully built pymeeus
 Installing collected packages: pymeeus, ephem, importlib-resources, convertdate, LunarCalendar, holidays, cmdstanpy, prophet
 Successfully installed LunarCalendar-0.0.9 cmdstanpy-1.1.0 convertdate-2.4.0 ephem-4.1.4 holidays-0.28 importlib-resources-6.0.0 prophet-1.1.4 pymeeus-0.5.12

```
In [2]: import pandas as pd
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
import yfinance as yf
import prophet as prophet
```

MSFT

```
In [3]: myticker = 'MSFT'
mydata = pd.DataFrame()
mydata[myticker] = yf.download(myticker, start="2020-01-01", end="2021-12-31")
mydata.columns = {'Close Price'}
mydata.head(10)
```

[*****100%*****] 1 of 1 completed

Out[3]:

	Close Price
Date	
2020-01-02	155.422028
2020-01-03	153.486755
2020-01-06	153.883514
2020-01-07	152.480423
2020-01-08	154.909180
2020-01-09	156.844452
2020-01-10	156.118759
2020-01-13	157.995956
2020-01-14	156.883163
2020-01-15	157.899200

```
In [4]: mydata=mydata.reset_index()
mydata[['ds', 'y']] = mydata[['Date', 'Close Price']]
mydata
```

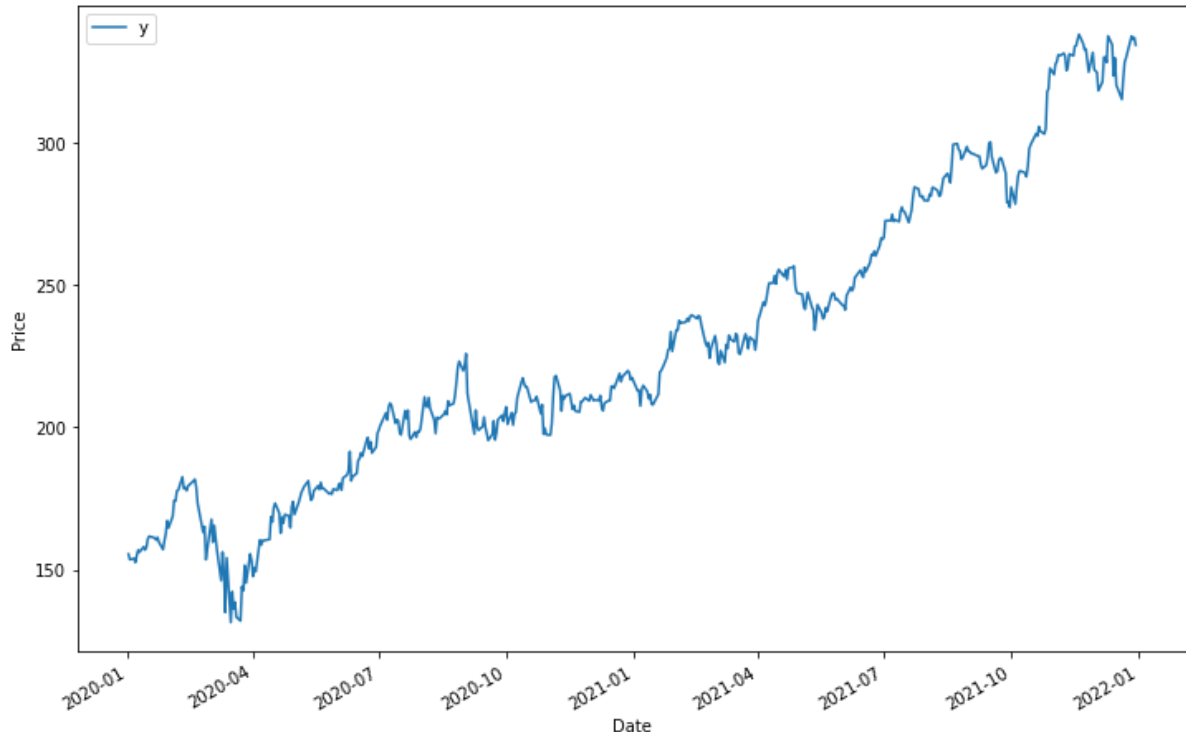
Out [4]:

	Date	Close Price	ds	y
0	2020-01-02	155.422028	2020-01-02	155.422028
1	2020-01-03	153.486755	2020-01-03	153.486755
2	2020-01-06	153.883514	2020-01-06	153.883514
3	2020-01-07	152.480423	2020-01-07	152.480423
4	2020-01-08	154.909180	2020-01-08	154.909180
...
499	2021-12-23	330.033112	2021-12-23	330.033112
500	2021-12-27	337.685150	2021-12-27	337.685150
501	2021-12-28	336.501801	2021-12-28	336.501801
502	2021-12-29	337.192078	2021-12-29	337.192078
503	2021-12-30	334.598694	2021-12-30	334.598694

504 rows × 4 columns

```
In [5]: model=prophet.Prophet()
prophet_mydata=mydata.drop(['Date', 'Close Price'], axis=1)
```

```
In [6]: ax = prophet_mydata.set_index('ds').plot(figsize=(12,8))
ax.set_ylabel('Price')
ax.set_xlabel('Date')
plt.show()
```



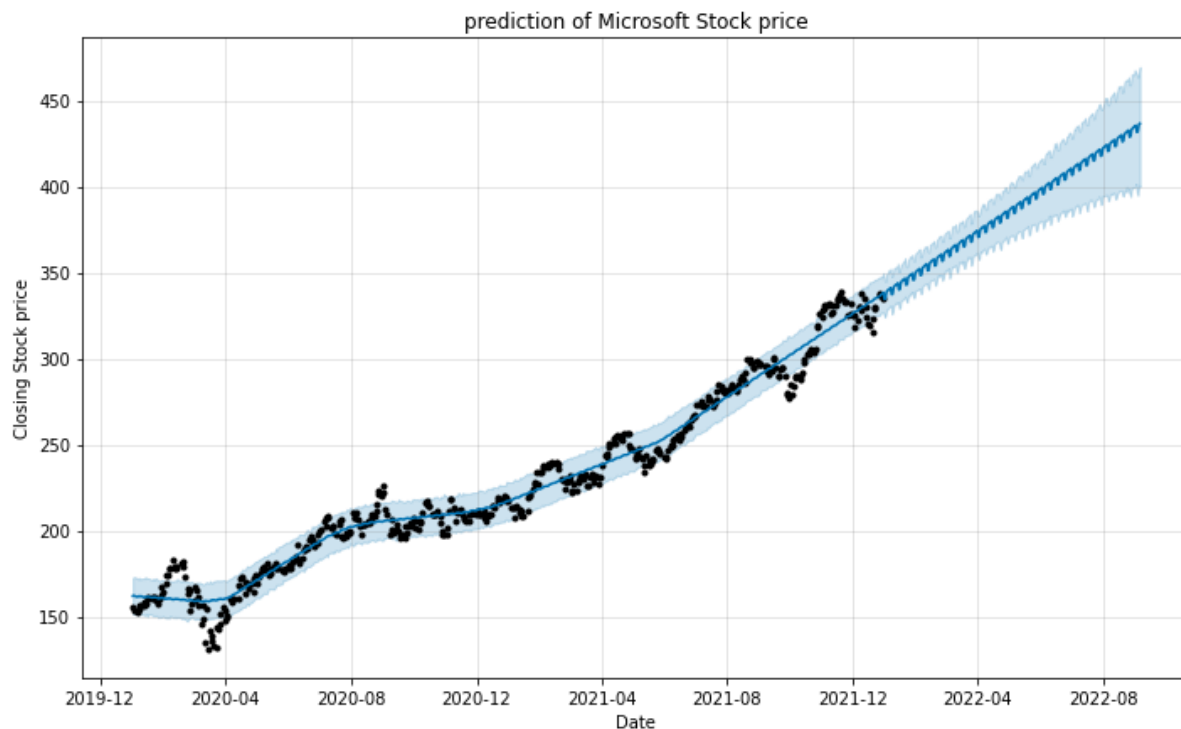
```
In [7]: model.fit(prophet_mydata)
```

```
17:18:56 - cmdstanpy - INFO - Chain [1] start processing
17:19:03 - cmdstanpy - INFO - Chain [1] done processing
```

```
Out[7]: <prophet.forecaster.Prophet at 0x11ec0a3b0>
```

```
In [8]: future=model.make_future_dataframe(periods=250)
```

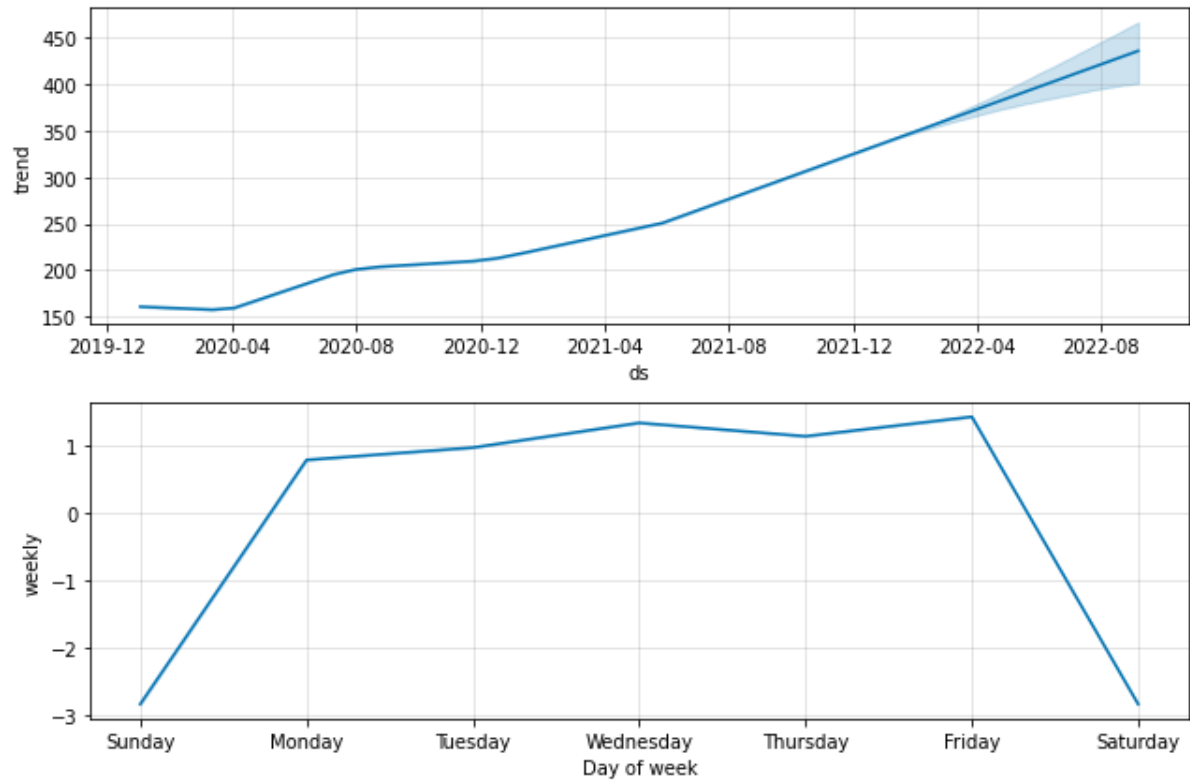
```
In [9]: predictions=model.predict(future)
model.plot(predictions)
plt.title("prediction of Microsoft Stock price")
plt.xlabel("Date")
plt.ylabel("Closing Stock price")
plt.show()
predictions[['ds','yhat','yhat_lower','yhat_upper']].tail()
```



```
Out[9]:
```

	ds	yhat	yhat_lower	yhat_upper
749	2022-09-02	435.428916	401.561670	466.544922
750	2022-09-03	431.549063	396.517429	464.964830
751	2022-09-04	431.945594	394.877005	463.551302
752	2022-09-05	435.976569	400.834753	466.991050
753	2022-09-06	436.556440	399.868156	469.534799

```
In [10]: model.plot_components(predictions)
plt.show()
```



KO

```
In [11]: myticker1 = 'KO'
mydata1 = pd.DataFrame()
mydata1[myticker] = yf.download(myticker1, start="2020-01-01",end="2021-12-31")
mydata1.columns = {'Close Price'}
mydata1.head(10)
```

[*****100%*****] 1 of 1 completed

Out[11]: Close Price

Date	
2020-01-02	49.307655
2020-01-03	49.038654
2020-01-06	49.020718
2020-01-07	48.644123
2020-01-08	48.733780
2020-01-09	49.621487
2020-01-10	49.791851
2020-01-13	50.329857
2020-01-14	50.213284
2020-01-15	50.840942

```
In [12]: mydata1=mydata1.reset_index()
mydata1[['ds','y']] = mydata1[['Date','Close Price']]
mydata1
```

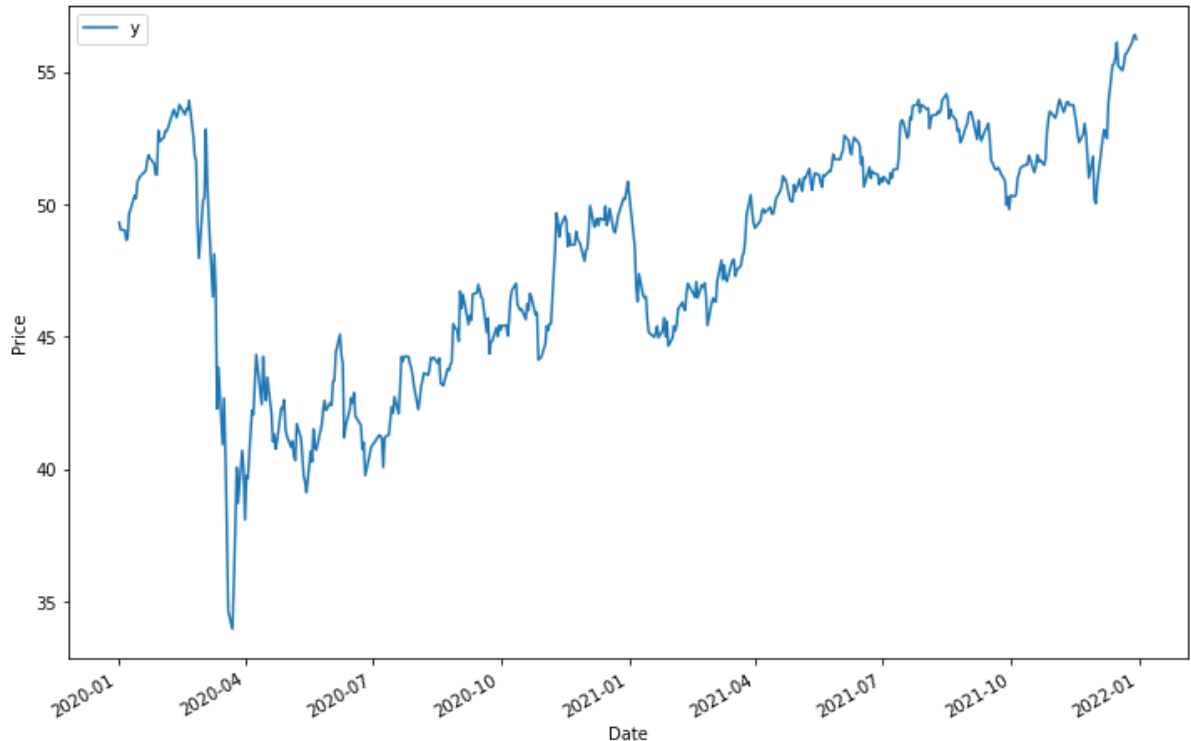
Out[12]:

	Date	Close Price	ds	y
0	2020-01-02	49.307655	2020-01-02	49.307655
1	2020-01-03	49.038654	2020-01-03	49.038654
2	2020-01-06	49.020718	2020-01-06	49.020718
3	2020-01-07	48.644123	2020-01-07	48.644123
4	2020-01-08	48.733780	2020-01-08	48.733780
...
499	2021-12-23	55.692444	2021-12-23	55.692444
500	2021-12-27	56.103775	2021-12-27	56.103775
501	2021-12-28	56.323795	2021-12-28	56.323795
502	2021-12-29	56.390751	2021-12-29	56.390751
503	2021-12-30	56.228130	2021-12-30	56.228130

504 rows × 4 columns

```
In [13]: model1=prophet.Prophet()
prophet_mydata1=mydata1.drop(['Date', 'Close Price'], axis=1)
```

```
In [14]: ax1 = prophet_mydata1.set_index('ds').plot(figsize=(12,8))
ax1.set_ylabel('Price')
ax1.set_xlabel('Date')
plt.show()
```



```
In [15]: model1.fit(prophet_mydata1)
```

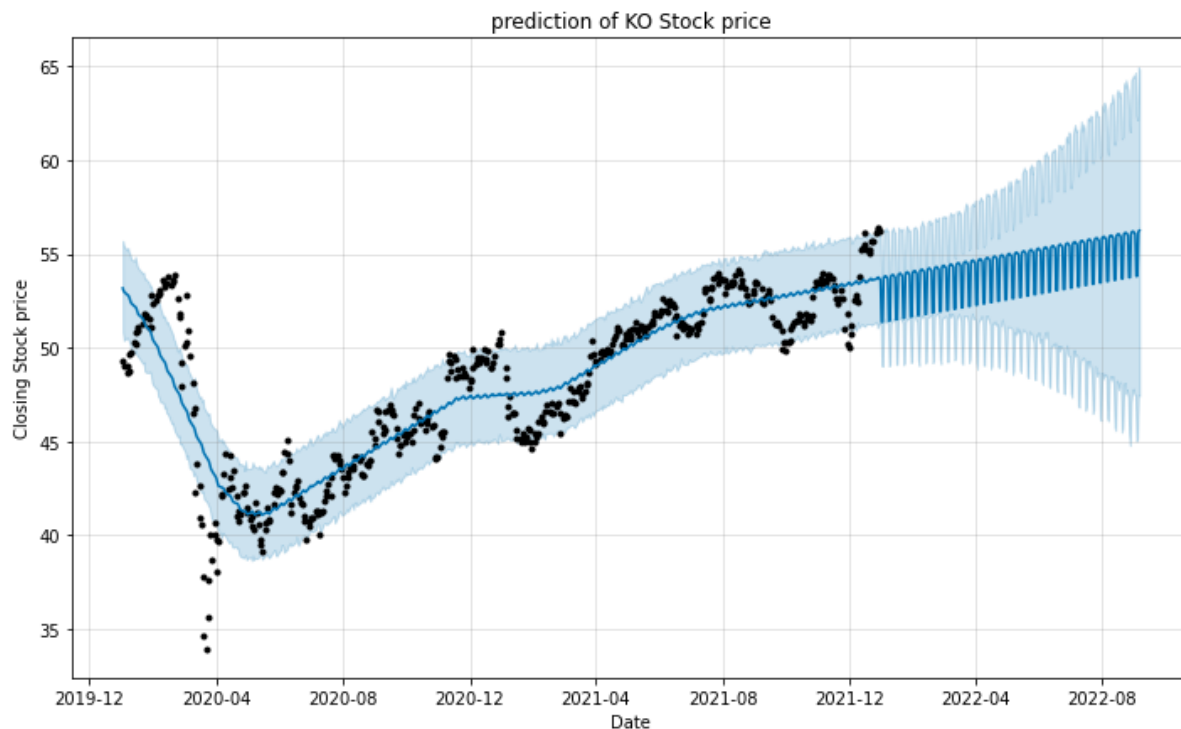
```
17:19:07 - cmdstanpy - INFO - Chain [1] start processing
17:19:07 - cmdstanpy - INFO - Chain [1] done processing
```

```
Out[15]: <prophet.forecaster.Prophet at 0x11f410ca0>
```



```
In [16]: future1=model1.make_future_dataframe(periods=250)
```

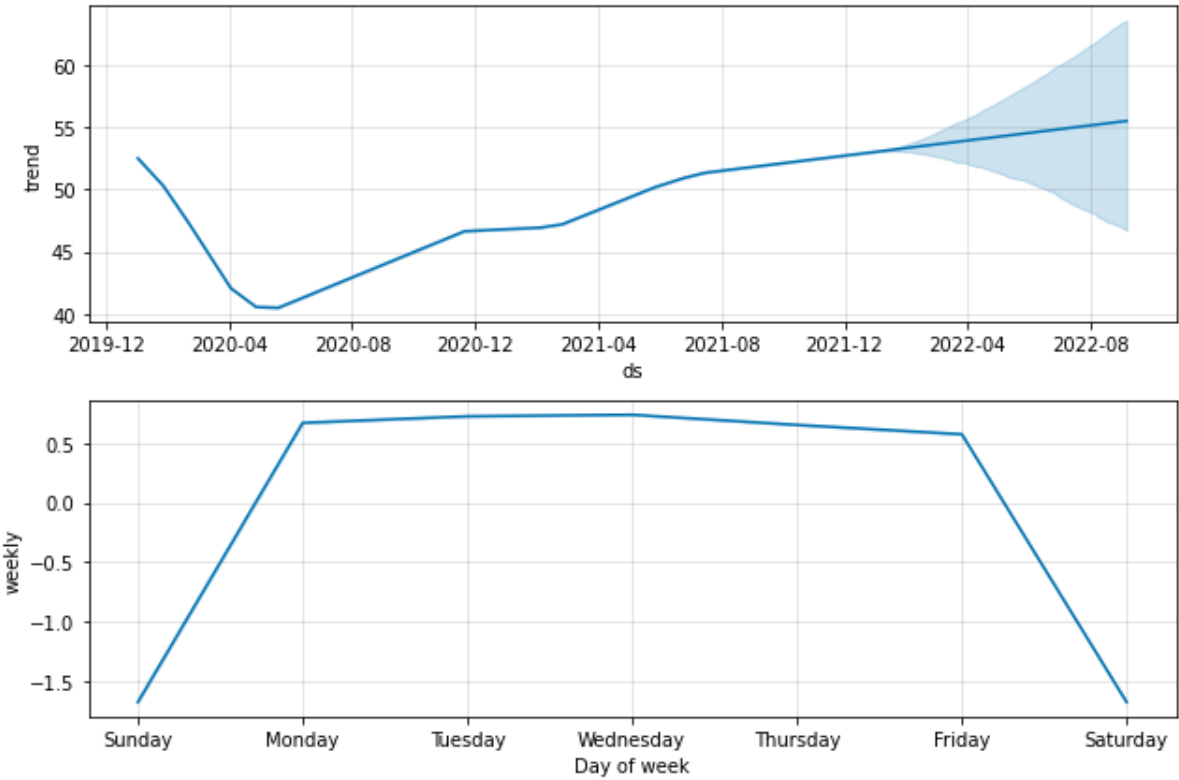
```
In [17]: predictions1=model1.predict(future1)
model1.plot(predictions1)
plt.title("prediction of KO Stock price")
plt.xlabel("Date")
plt.ylabel("Closing Stock price")
plt.show()
predictions1[['ds','yhat','yhat_lower','yhat_upper']].tail()
```



```
Out[17]:
```

	ds	yhat	yhat_lower	yhat_upper
749	2022-09-02	56.056539	47.499611	64.660475
750	2022-09-03	53.813638	45.016099	62.407943
751	2022-09-04	53.823632	45.120440	62.161768
752	2022-09-05	56.182099	47.482189	64.967373
753	2022-09-06	56.247636	47.443087	64.829897

```
In [18]: model1.plot_components(predictions1)
plt.show()
```



In []: