

```
!pip install pystan~=2.14
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Collecting pystan~=2.14
  Downloading pystan-2.19.1.1.tar.gz (16.2 MB)
    16.2/16.2 MB 21.9 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
Requirement already satisfied: Cython!>=0.25.1,>=0.22 in /usr/local/lib/python3.9/dist-packages (from pystan~=2.14) (0.29.33)
Requirement already satisfied: numpy>=1.7 in /usr/local/lib/python3.9/dist-packages (from pystan~=2.14) (1.22.4)
Building wheels for collected packages: pystan
  Building wheel for pystan (setup.py) ... done
  Created wheel for pystan: filename=pystan-2.19.1.1-cp39-cp39-linux_x86_64.whl size=61826275 sha256=c3eccfd40112a59624c68030fb17906b15f
  Stored in directory: /root/.cache/pip/wheels/b8/36/bf/7ec7e363f796373cea3eb9ea94e83f5bb586d2edbf7e3417
Successfully built pystan
Installing collected packages: pystan
Successfully installed pystan-2.19.1.1
```

```
!pip install fbprophet
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Collecting fbprophet
  Downloading fbprophet-0.7.1.tar.gz (64 kB)
    64.0/64.0 KB 4.5 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
Requirement already satisfied: Cython>=0.22 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (0.29.33)
Collecting cmdstanpy==0.9.5
  Downloading cmdstanpy-0.9.5-py3-none-any.whl (37 kB)
Requirement already satisfied: pystan>=2.14 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (2.19.1.1)
Requirement already satisfied: numpy>=1.15.4 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (1.22.4)
Requirement already satisfied: pandas>=1.0.4 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (1.4.4)
Requirement already satisfied: matplotlib>=2.0.0 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (3.7.1)
Requirement already satisfied: LunarCalendar>=0.0.9 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (0.0.9)
Requirement already satisfied: convertdate>=2.1.2 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (2.4.0)
Requirement already satisfied: holidays>=0.10.2 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (0.21.13)
Collecting setuptools>=1.2
  Downloading setuptools_git-1.2-py2.py3-none-any.whl (10 kB)
Requirement already satisfied: python-dateutil>=2.8.0 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (2.8.2)
Requirement already satisfied: tqdm>=4.36.1 in /usr/local/lib/python3.9/dist-packages (from fbprophet) (4.65.0)
Requirement already satisfied: pymeeus<1,>=0.3.13 in /usr/local/lib/python3.9/dist-packages (from convertdate>=2.1.2->fbprophet) (0.5.1)
Requirement already satisfied: hijri-converter in /usr/local/lib/python3.9/dist-packages (from holidays>=0.10.2->fbprophet) (2.2.4)
Requirement already satisfied: korean-lunar-calendar in /usr/local/lib/python3.9/dist-packages (from holidays>=0.10.2->fbprophet) (0.3.1)
Requirement already satisfied: ephemeris>=3.7.5.3 in /usr/local/lib/python3.9/dist-packages (from LunarCalendar>=0.0.9->fbprophet) (4.1.4)
Requirement already satisfied: pytz in /usr/local/lib/python3.9/dist-packages (from LunarCalendar>=0.0.9->fbprophet) (2022.7.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.9/dist-packages (from matplotlib>=2.0.0->fbprophet) (1.0.7)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.9/dist-packages (from matplotlib>=2.0.0->fbprophet) (3.0.9)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.9/dist-packages (from matplotlib>=2.0.0->fbprophet) (23.0)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.9/dist-packages (from matplotlib>=2.0.0->fbprophet) (4.39.2)
Requirement already satisfied: importlib-resources>=3.2.0 in /usr/local/lib/python3.9/dist-packages (from matplotlib>=2.0.0->fbprophet) (3.2.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.9/dist-packages (from matplotlib>=2.0.0->fbprophet) (0.11.0)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.9/dist-packages (from matplotlib>=2.0.0->fbprophet) (1.4.4)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.9/dist-packages (from matplotlib>=2.0.0->fbprophet) (8.4.0)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.9/dist-packages (from python-dateutil>=2.8.0->fbprophet) (1.16.0)
Requirement already satisfied: zipp>=3.1.0 in /usr/local/lib/python3.9/dist-packages (from importlib-resources>=3.2.0->matplotlib>=2.0.0->fbprophet) (3.10.0)
Building wheels for collected packages: fbprophet
  Building wheel for fbprophet (setup.py) ... done
  Created wheel for fbprophet: filename=fbprophet-0.7.1-py3-none-any.whl size=9435716 sha256=e4eeca85c9e1ed86a3e05f39335a309ea4dd5a0a4f7
  Stored in directory: /root/.cache/pip/wheels/da/a4/bb/dbed5db92b2183a753dd96cc8a56706a61484ff3959988bdaa
Successfully built fbprophet
Installing collected packages: setuptools-git, cmdstanpy, fbprophet
  Attempting uninstall: cmdstanpy
    Found existing installation: cmdstanpy 1.1.0
    Uninstalling cmdstanpy-1.1.0:
      Successfully uninstalled cmdstanpy-1.1.0
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source
prophet 1.1.2 requires cmdstanpy>=1.0.4, but you have cmdstanpy 0.9.5 which is incompatible.
Successfully installed cmdstanpy-0.9.5 fbprophet-0.7.1 setuptools-git-1.2
```

```
!pip install yfinance
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: yfinance in /usr/local/lib/python3.9/dist-packages (0.2.13)
Requirement already satisfied: pandas>=1.3.0 in /usr/local/lib/python3.9/dist-packages (from yfinance) (1.4.4)
Requirement already satisfied: pytz>=2022.5 in /usr/local/lib/python3.9/dist-packages (from yfinance) (2022.7.1)
Requirement already satisfied: frozendict>=2.3.4 in /usr/local/lib/python3.9/dist-packages (from yfinance) (2.3.6)
Requirement already satisfied: multitasking>=0.0.7 in /usr/local/lib/python3.9/dist-packages (from yfinance) (0.0.11)
Requirement already satisfied: appdirs>=1.4.4 in /usr/local/lib/python3.9/dist-packages (from yfinance) (1.4.4)
Requirement already satisfied: lxml>=4.9.1 in /usr/local/lib/python3.9/dist-packages (from yfinance) (4.9.2)
Requirement already satisfied: requests>=2.26 in /usr/local/lib/python3.9/dist-packages (from yfinance) (2.27.1)
Requirement already satisfied: cryptography>=3.3.2 in /usr/local/lib/python3.9/dist-packages (from yfinance) (39.0.2)
```

Requirement already satisfied: numpy>=1.16.5 in /usr/local/lib/python3.9/dist-packages (from yfinance) (1.22.4)
Requirement already satisfied: beautifulsoup4>=4.11.1 in /usr/local/lib/python3.9/dist-packages (from yfinance) (4.11.2)
Requirement already satisfied: html5lib>=1.1 in /usr/local/lib/python3.9/dist-packages (from yfinance) (1.1)
Requirement already satisfied: soupsieve>1.2 in /usr/local/lib/python3.9/dist-packages (from beautifulsoup4>=4.11.1->yfinance) (2.4)
Requirement already satisfied: cffi>=1.12 in /usr/local/lib/python3.9/dist-packages (from cryptography>=3.3.2->yfinance) (1.15.1)
Requirement already satisfied: six>=1.9 in /usr/local/lib/python3.9/dist-packages (from html5lib>=1.1->yfinance) (1.16.0)
Requirement already satisfied: webencodings in /usr/local/lib/python3.9/dist-packages (from html5lib>=1.1->yfinance) (0.5.1)
Requirement already satisfied: python-dateutil>=2.8.1 in /usr/local/lib/python3.9/dist-packages (from pandas>=1.3.0->yfinance) (2.8.2)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /usr/local/lib/python3.9/dist-packages (from requests>=2.26->yfinance) (1.26.15)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.9/dist-packages (from requests>=2.26->yfinance) (3.4)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.9/dist-packages (from requests>=2.26->yfinance) (2022.12.7)
Requirement already satisfied: charset-normalizer~=2.0.0 in /usr/local/lib/python3.9/dist-packages (from requests>=2.26->yfinance) (2.0.12)
Requirement already satisfied: pycparser in /usr/local/lib/python3.9/dist-packages (from cffi>=1.12->cryptography>=3.3.2->yfinance) (2.2.1)

```
import fbprophet as fb
import yfinance as yf
import pandas as pd
```

```
df = yf.download('BTC-USD')
```

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

df

	Open	High	Low	Close	Adj Close	Vo
Date						
2014-09-17	465.864014	468.174011	452.421997	457.334015	457.334015	2105
2014-09-18	456.859985	456.859985	413.104004	424.440002	424.440002	3448
2014-09-19	424.102997	427.834991	384.532013	394.795990	394.795990	3791
2014-09-20	408.903992	408.903992	389.882996	408.903992	408.903992	3686
2014-09-21	408.903992	412.420995	393.181000	398.821014	398.821014	2658
...
2023-03-24	28324.111328	28388.437500	27039.265625	27493.285156	27493.285156	2598031
2023-03-25	27487.337891	27791.826172	27196.234375	27494.707031	27494.707031	1338300

```
df.reset_index(inplace=True)
df = df[['Date', 'Adj Close']]
df.head()
```

	Date	Adj Close
0	2014-09-17	457.334015
1	2014-09-18	424.440002
2	2014-09-19	394.795990
3	2014-09-20	408.903992
4	2014-09-21	398.821014

```
df['Adj Close'].plot()
```



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

```
Date      0
Adj Close  0
dtype: int64
```

```
df.rename(columns= {'Date':'ds','Adj Close':'y'},inplace=True)
```

```
<ipython-input-10-cfa78aa1cda7>:1: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame
```

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
df.rename(columns= {'Date':'ds','Adj Close':'y'},inplace=True)
```

```
df.head()
```

	ds	y
0	2014-09-17	457.334015
1	2014-09-18	424.440002
2	2014-09-19	394.795990
3	2014-09-20	408.903992
4	2014-09-21	398.821014

```
from fbprophet import Prophet
model = Prophet()
model.fit(df)
```

Saving...

seasonality. Run prophet with daily_seasonality=True to override this.

```
/usr/local/lib/python3.9/dist-packages/fbprophet/forecaster.py:891: FutureWarning: The frame.append method is deprecated and will be removed in a future version. Use .append() instead.
components = components.append(new_comp)
<fbprophet.forecaster.Prophet at 0x7f8a7cb62cd0>
```

```
pred = model.predict()
```

```
/usr/local/lib/python3.9/dist-packages/fbprophet/forecaster.py:891: FutureWarning: The frame.append method is deprecated and will be removed in a future version. Use .append() instead.
components = components.append(new_comp)
/usr/local/lib/python3.9/dist-packages/fbprophet/forecaster.py:891: FutureWarning: The frame.append method is deprecated and will be removed in a future version. Use .append() instead.
components = components.append(new_comp)
```

```
future_predict = model.make_future_dataframe(periods=20)
```

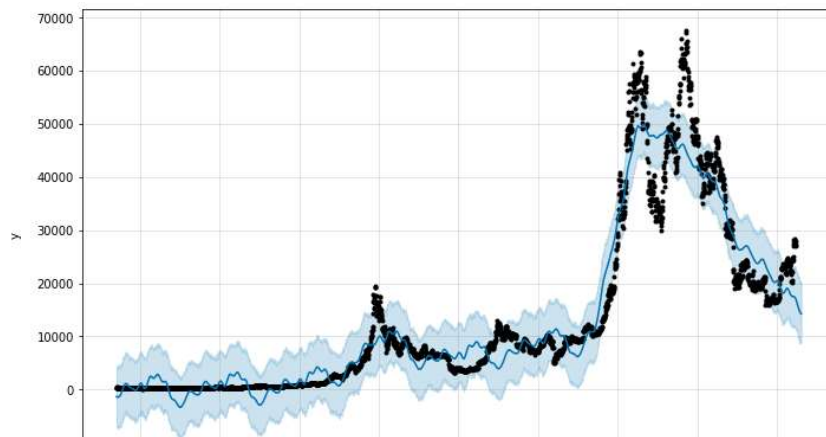
```
# create a future data frame
```

```
future = model.make_future_dataframe(periods=25)
forecast = model.predict(future)
```

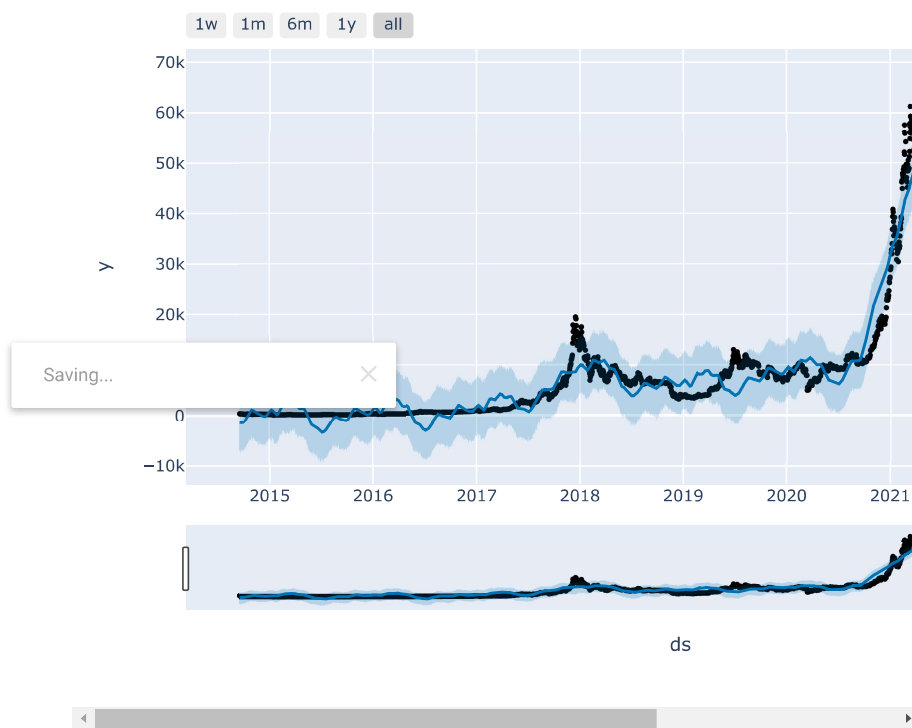
```
/usr/local/lib/python3.9/dist-packages/fbprophet/forecaster.py:891: FutureWarning: The frame.append method is deprecated and will be removed in a future version. Use .append() instead.
components = components.append(new_comp)
/usr/local/lib/python3.9/dist-packages/fbprophet/forecaster.py:891: FutureWarning: The frame.append method is deprecated and will be removed in a future version. Use .append() instead.
components = components.append(new_comp)
```

```
forecast[['ds', 'yhat', 'yhat_lower', 'yhat_upper']].head()
```

```
# plot
fig = model.plot(forecast)
```



```
from fbprophet.plot import plot_plotly
plot_plotly(model, pred)
```

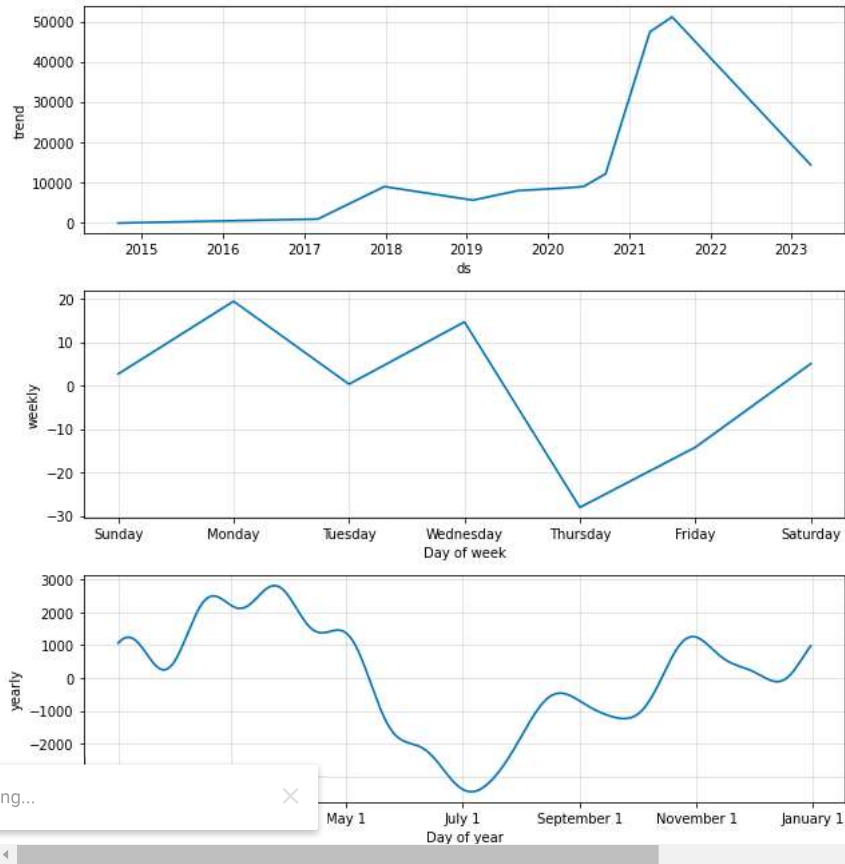


```
fig2 = model.plot_components(pred)
```



```
/usr/local/lib/python3.9/dist-packages/fbprophet/forecaster.py:891: FutureWarning:
The frame.append method is deprecated and will be removed from pandas in a future versio

/usr/local/lib/python3.9/dist-packages/fbprophet/forecaster.py:891: FutureWarning:
The frame.append method is deprecated and will be removed from pandas in a future versio
```



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✓ 3s completed at 9:45 AM

