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```
# 0) Install required packages (run once in Colab)
!pip install --quiet pmdarima statsmodels matplotlib seaborn joblib

# sometimes colab has pandas mismatch warnings; ignore
```

```
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```

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
data=pd.read_csv('bitcoin_data_2014_to_2025.csv')
data.head()
```

	Date	Close	High	Low	Open	Volume
0	2014-09-17	457.334015	468.174011	452.421997	465.864014	21056800
1	2014-09-18	424.440002	456.859985	413.104004	456.859985	34483200
2	2014-09-19	394.795990	427.834991	384.532013	424.102997	37919700
3	2014-09-20	408.903992	423.295990	389.882996	394.673004	36863600
4	2014-09-21	398.821014	412.425995	393.181000	408.084991	26580100

Next steps: Generate code with data | New interactive sheet

```
data.columns
```

```
Index(['Date', 'Close', 'High', 'Low', 'Open', 'Volume'], dtype='object')
```

```
data=data.drop(columns=['High','Low','Open','Volume'])
data.head()
```

	Date	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

Next steps: Generate code with data | New interactive sheet

```
data=data.rename(columns={'Date':'ds','Close':'y'})
data.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

Next steps: Generate code with data | New interactive sheet

```
data['ds']=pd.to_datetime(data['ds'])
print(data.head())
data.dtypes
```

```
          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
```

	0
ds	datetime64[ns]
y	float64

dtype: object

```
data['returns']=data['y'].pct_change()
print(data.head())
data.tail()
```

```
          ds           y   returns
0 2014-09-17  457.334015       NaN
1 2014-09-18  424.440002 -0.071926
2 2014-09-19  394.795990 -0.069843
3 2014-09-20  408.903992  0.035735
4 2014-09-21  398.821014 -0.024659
```

	ds	y	returns
4090	2025-11-28	90919.265625	-0.004011
4091	2025-11-29	90851.757812	-0.000743
4092	2025-11-30	90394.312500	-0.005035
4093	2025-12-01	86321.570312	-0.045055
4094	2025-12-02	87785.914062	0.016964

```
data['log_returns']=np.log(data['y']).diff()
print(data.head())
data.tail()
```

```
          ds           y   returns  log_returns
0 2014-09-17  457.334015       NaN          NaN
1 2014-09-18  424.440002 -0.071926    -0.074643
2 2014-09-19  394.795990 -0.069843    -0.072402
3 2014-09-20  408.903992  0.035735     0.035111
4 2014-09-21  398.821014 -0.024659    -0.024968
```

	ds	y	returns	log_returns
4090	2025-11-28	90919.265625	-0.004011	-0.004019
4091	2025-11-29	90851.757812	-0.000743	-0.000743
4092	2025-11-30	90394.312500	-0.005035	-0.005048
4093	2025-12-01	86321.570312	-0.045055	-0.046102
4094	2025-12-02	87785.914062	0.016964	0.016822

```
temp_data=pd.read_csv('bitcoin_data_2014_to_2025.csv')
data['volatility']=temp_data['High']-temp_data['Low']
print(data.head())
print(data.tail())
```

```
          ds           y   returns  log_returns  volatility
0 2014-09-17  457.334015       NaN          NaN   15.752014
1 2014-09-18  424.440002 -0.071926    -0.074643   43.755981
2 2014-09-19  394.795990 -0.069843    -0.072402   43.302979
3 2014-09-20  408.903992  0.035735     0.035111   33.412994
4 2014-09-21  398.821014 -0.024659    -0.024968   19.244995
             ds            y   returns  log_returns   volatility
4090 2025-11-28  90919.265625 -0.004011    -0.004019  2711.968750
4091 2025-11-29  90851.757812 -0.000743    -0.000743   927.429688
4092 2025-11-30  90394.312500 -0.005035    -0.005048  1570.734375
4093 2025-12-01  86321.570312 -0.045055    -0.046102  6535.906250
4094 2025-12-02  87785.914062  0.016964     0.016822  1562.312500
```

```
data['volume_norm']=(temp_data['Volume']-temp_data['Volume'].mean())/temp_da
print(data.head())
print(data.tail())
```

```
          ds           y   returns  log_returns  volatility  volume_norm
0 2014-09-17  457.334015       NaN          NaN   15.752014    -0.939431
1 2014-09-18  424.440002 -0.071926    -0.074643   43.755981    -0.938843
2 2014-09-19  394.795990 -0.069843    -0.072402   43.302979    -0.938693
3 2014-09-20  408.903992  0.035735     0.035111   33.412994    -0.938739
4 2014-09-21  398.821014 -0.024659    -0.024968   19.244995    -0.939189
             ds             y   returns  log_returns   volatility  volume_nor
4090 2025-11-28  90919.265625 -0.004011    -0.004019  2711.968750     1.72814
4091 2025-11-29  90851.757812 -0.000743    -0.000743   927.429688     0.72140
4092 2025-11-30  90394.312500 -0.005035    -0.005048  1570.734375     0.74665
4093 2025-12-01  86321.570312 -0.045055    -0.046102  6535.906250     2.91424
4094 2025-12-02  87785.914062  0.016964     0.016822  1562.312500     2.12590
```

```
data['ma7'] = temp_data['Close'].rolling(7).mean()
print(data.head())
print(data.tail())
```

```
          ds           y   returns  log_returns  volatility  volume_norm  ma7
0 2014-09-17  457.334015       NaN          NaN   15.752014    -0.939431  NaN
1 2014-09-18  424.440002 -0.071926    -0.074643   43.755981    -0.938843  NaN
2 2014-09-19  394.795990 -0.069843    -0.072402   43.302979    -0.938693  NaN
3 2014-09-20  408.903992  0.035735     0.035111   33.412994    -0.938739  NaN
4 2014-09-21  398.821014 -0.024659    -0.024968   19.244995    -0.939189  NaN
             ds             y   returns  log_returns   volatility  \
4090 2025-11-28  90919.265625 -0.004011    -0.004019  2711.968750
4091 2025-11-29  90851.757812 -0.000743    -0.000743   927.429688
4092 2025-11-30  90394.312500 -0.005035    -0.005048  1570.734375
4093 2025-12-01  86321.570312 -0.045055    -0.046102  6535.906250
4094 2025-12-02  87785.914062  0.016964     0.016822  1562.312500

      volume_norm           ma7
4090     1.728146  88541.261161
4091     0.721406  89427.460938
4092     0.746652  89940.218750
4093     2.914245  89661.791295
4094     2.125907  89725.223214
```

```
data['returns'] = data['returns'].fillna(0)
data['log_returns'] = data['log_returns'].fillna(0)
print(data.head())
print(data.tail())
```

```
          ds           y   returns  log_returns  volatility  volume_norm  ma7
0 2014-09-17  457.334015  0.000000     0.000000   15.752014    -0.939431  NaN
1 2014-09-18  424.440002 -0.071926    -0.074643   43.755981    -0.938843  NaN
2 2014-09-19  394.795990 -0.069843    -0.072402   43.302979    -0.938693  NaN
3 2014-09-20  408.903992  0.035735     0.035111   33.412994    -0.938739  NaN
4 2014-09-21  398.821014 -0.024659    -0.024968   19.244995    -0.939189  NaN
             ds             y   returns  log_returns   volatility  \
4090 2025-11-28  90919.265625 -0.004011    -0.004019  2711.968750
4091 2025-11-29  90851.757812 -0.000743    -0.000743   927.429688
```

```
4092 2025-11-30  90394.312500 -0.005035    -0.005048  1570.734375
4093 2025-12-01  86321.570312 -0.045055    -0.046102  6535.906250
4094 2025-12-02  87785.914062  0.016964     0.016822  1562.312500

      volume_norm           ma7
4090     1.728146  88541.261161
4091     0.721406  89427.460938
4092     0.746652  89940.218750
4093     2.914245  89661.791295
4094     2.125907  89725.223214
```

```
data.head(10)
```

	ds	y	returns	log_returns	volatility	volume_norm	m
0	2014-09-17	457.334015	0.000000	0.000000	15.752014	-0.939431	Na
1	2014-09-18	424.440002	-0.071926	-0.074643	43.755981	-0.938843	Na
2	2014-09-19	394.795990	-0.069843	-0.072402	43.302979	-0.938693	Na
3	2014-09-20	408.903992	0.035735	0.035111	33.412994	-0.938739	Na
4	2014-09-21	398.821014	-0.024659	-0.024968	19.244995	-0.939189	Na
5	2014-09-22	402.152008	0.008352	0.008317	9.785980	-0.939297	Na
6	2014-09-23	435.790985	0.083647	0.080333	45.360016	-0.938378	417.4625
7	2014-09-24	423.204987	-0.028881	-0.029306	14.980011	-0.939012	412.5869
8	2014-09-25	411.574005	-0.027483	-0.027868	14.052002	-0.939179	410.7489
9	2014-09-26	404.424988	-0.017370	-0.017523	14.928986	-0.939414	412.1245

Next steps: Generate code with data | New interactive sheet

```
data = data.dropna(subset=['ma7']).reset_index(drop=True)
print(data.head())
print(data.tail())
```

```
          ds           y   returns  log_returns  volatility  volume_norm  \
0 2014-09-23  435.790985  0.083647     0.080333   45.360016    -0.938378
1 2014-09-24  423.204987 -0.028881    -0.029306   14.980011    -0.939012
2 2014-09-25  411.574005 -0.027483    -0.027868   14.052002    -0.939179
3 2014-09-26  404.424988 -0.017370    -0.017523   14.928986    -0.939414
```

```
4 2014-09-27  399.519989 -0.012128    -0.012202    9.250977    -0.939696

          ma7
0  417.462572
1  412.586997
2  410.748997
3  412.124568
4  410.783997
             ds             y   returns  log_returns   volatility  \
4084 2025-11-28  90919.265625 -0.004011    -0.004019  2711.968750
4085 2025-11-29  90851.757812 -0.000743    -0.000743   927.429688
4086 2025-11-30  90394.312500 -0.005035    -0.005048  1570.734375
4087 2025-12-01  86321.570312 -0.045055    -0.046102  6535.906250
4088 2025-12-02  87785.914062  0.016964     0.016822  1562.312500

      volume_norm           ma7
4084     1.728146  88541.261161
4085     0.721406  89427.460938
4086     0.746652  89940.218750
4087     2.914245  89661.791295
4088     2.125907  89725.223214
```

```
data.columns
```

```
Index(['ds', 'y', 'returns', 'log_returns', 'volatility', 'volume_norm',
       'ma7'],
      dtype='object')
```

```
from prophet import Prophet
model=Prophet()
model.add_regressor('returns')
model.add_regressor('log_returns')
model.add_regressor('volatility')
model.add_regressor('volume_norm')
model.add_regressor('ma7')
```

```
<prophet.forecaster.Prophet at 0x7cbfd8b19160>
```

```
model.fit(data)
```

```
INFO:prophet:Disabling daily seasonality. Run prophet with daily_seasonality=
<prophet.forecaster.Prophet at 0x7cbfd8b19160>
```

```
data.to_csv('prophet_prepared_data.csv',index=False)
```

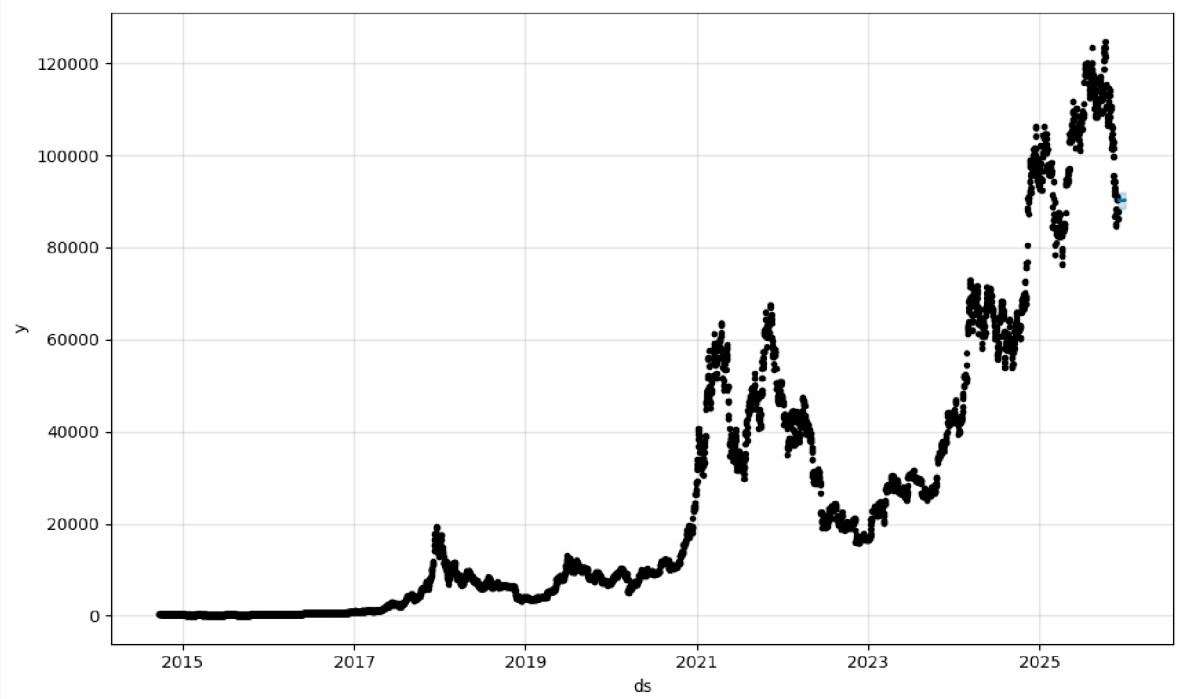
```
# get last row of your df
last = data.iloc[-1]

future_dates = pd.date_range(start=data.iloc[-1]['ds'] + pd.Timedelta(days=1
periods=30, freq='D')
```

```
# create future df
future = pd.DataFrame({'ds': future_dates})
```

```
# repeat last known regressor values
future['returns'] = last['returns']
future['log_returns'] = last['log_returns']
future['volatility'] = last['volatility']
future['volume_norm'] = last['volume_norm']
future['ma7'] = last['ma7']
```

```
forecast = model.predict(future)
```

```
model.plot(forecast)
plt.show()
```




```
import pickle

with open("prophet_model.pkl", "wb") as f:
    pickle.dump(model, f)
```

```
Start coding or generate with AI.
```

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