

Currency Exchange Rate Prediction (USD to INR)

0. Install and Import the required dependencies

```
In [33]: !pip install pystan
!pip install fbprophet
```

...

```
In [21]: import pandas as pd
from fbprophet import Prophet
```

```
In [2]: #As Prophet mostly gives non hazardous warnings all the time, it is better to sil

import warnings
warnings.simplefilter('ignore')
```

1. Read and Process the data

```
In [3]: df = pd.read_csv('dataset.csv')
```

```
In [4]: df.columns
```

```
Out[4]: Index(['Date', 'Algerian Dinar', 'Australian Dollar', 'Bahrain Dinar',
              'Bolivar Fuerte', 'Botswana Pula', 'Brazilian Real', 'Brunei Dollar',
              'Canadian Dollar', 'Chilean Peso', 'Chinese Yuan', 'Colombian Peso',
              'Czech Koruna', 'Danish Krone', 'Euro', 'Hungarian Forint',
              'Icelandic Krona', 'Indian Rupee', 'Indonesian Rupiah', 'Iranian Rial',
              'Israeli New Sheqel', 'Japanese Yen', 'Kazakhstani Tenge', 'Korean Won',
              'Kuwaiti Dinar', 'Libyan Dinar', 'Malaysian Ringgit', 'Mauritian Rupee',
              'Mexican Peso', 'Nepalese Rupee', 'New Zealand Dollar',
              'Norwegian Krone', 'Nuevo Sol', 'Pakistani Rupee', 'Peso Uruguayo',
              'Philippine Peso', 'Polish Zloty', 'Qatar Riyal', 'Rial Omani',
              'Russian Ruble', 'Saudi Arabian Riyal', 'Singapore Dollar',
              'South African Rand', 'Sri Lanka Rupee', 'Swedish Krona', 'Swiss Franc',
              'Thai Baht', 'Trinidad And Tobago Dollar', 'Tunisian Dinar',
              'U.A.E. Dirham', 'U.K. Pound Sterling', 'U.S. Dollar'],
              dtype='object')
```

```
In [5]: df = df[['Date', 'Indian Rupee']]
df
```

Out[5]:

	Date	Indian Rupee
0	1995-1-2	NaN
1	1995-1-3	31.3700
2	1995-1-4	31.3700
3	1995-1-5	31.3700
4	1995-1-6	31.3700
...
5973	2018-4-26	66.8299
5974	2018-4-27	66.7801
5975	2018-4-30	66.7801
5976	2018-5-1	NaN
5977	2018-5-2	NaN

5978 rows × 2 columns

```
In [6]: df.isna().sum()
```

Out[6]: Date 0
Indian Rupee 429
dtype: int64

```
In [7]: df = df.dropna()
df.head()
```

Out[7]:

	Date	Indian Rupee
1	1995-1-3	31.37
2	1995-1-4	31.37
3	1995-1-5	31.37
4	1995-1-6	31.37
5	1995-1-9	31.37

```
In [8]: df[df.duplicated()].sum()
```

Out[8]: Date 0.0
Indian Rupee 0.0
dtype: float64

```
In [9]: df.columns = ['ds', 'y']
```

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

```
Out[10]:
```

	ds	y
1	1995-1-3	31.37
2	1995-1-4	31.37
3	1995-1-5	31.37
4	1995-1-6	31.37
5	1995-1-9	31.37

2. Training the Machine Learning Model

```
In [23]: m = Prophet(daily_seasonality = 0.95)
m.fit(df)
```

```
Out[23]: <fbprophet.forecaster.Prophet at 0x19efcbc8370>
```

3. Future rate prediction

```
In [25]: future = m.make_future_dataframe(periods=365,freq='D')
forecast = m.predict(future)
forecast.tail()
```

```
Out[25]:
```

	ds	trend	yhat_lower	yhat_upper	trend_lower	trend_upper	additive_terms	additive_terms
9	2019-04-26	69.071098	65.355514	71.447606	66.760574	71.697403	-0.603096	-0.
0	2019-04-27	69.075279	65.492877	71.727203	66.753003	71.711501	-0.452996	-0.
1	2019-04-28	69.079460	65.666475	71.615535	66.744232	71.725599	-0.442961	-0.
2	2019-04-29	69.083641	65.623699	71.501547	66.726354	71.739697	-0.586886	-0.
3	2019-04-30	69.087822	65.776199	71.612876	66.707412	71.753796	-0.540968	-0.



In [27]: df

Out[27]:

	ds	y
1	1995-1-3	31.3700
2	1995-1-4	31.3700
3	1995-1-5	31.3700
4	1995-1-6	31.3700
5	1995-1-9	31.3700
...
5971	2018-4-24	66.3622
5972	2018-4-25	66.6983
5973	2018-4-26	66.8299
5974	2018-4-27	66.7801
5975	2018-4-30	66.7801

5549 rows × 2 columns

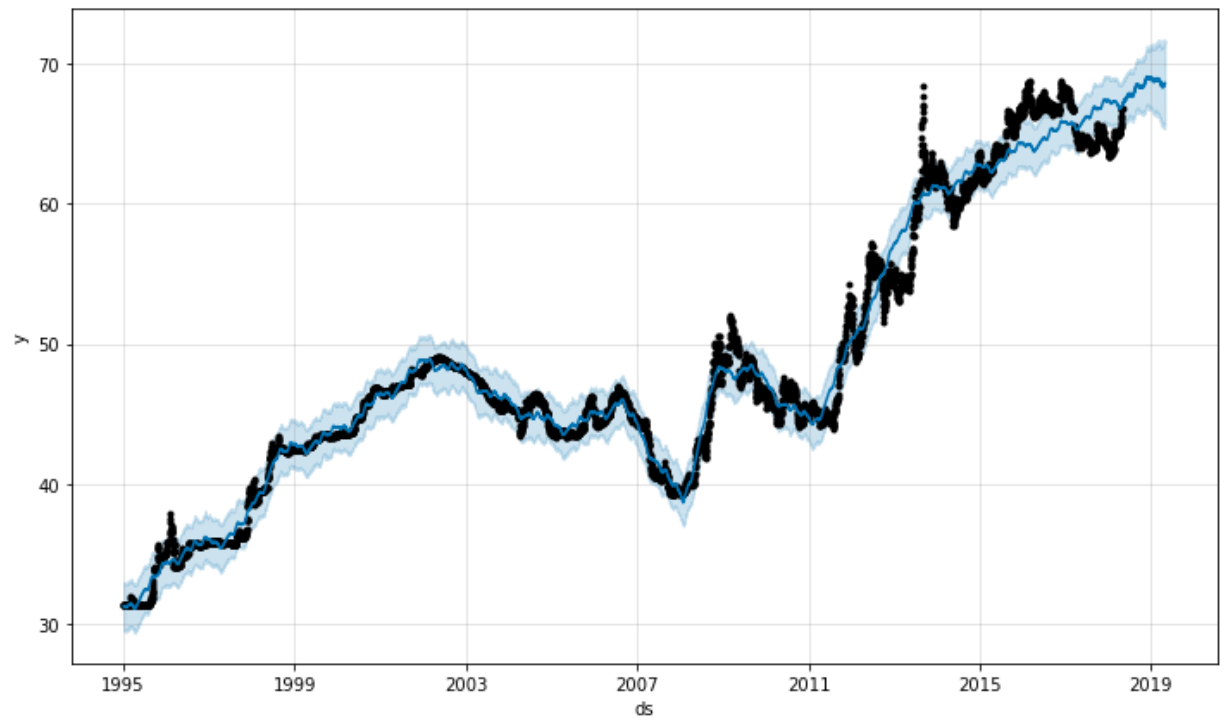
In [30]: prediction = forecast[['ds', 'yhat']]
prediction

Out[30]:

	ds	yhat
0	1995-01-03	31.311022
1	1995-01-04	31.326226
2	1995-01-05	31.304475
3	1995-01-06	31.290270
4	1995-01-09	31.266651
...
5909	2019-04-26	68.468002
5910	2019-04-27	68.622283
5911	2019-04-28	68.636499
5912	2019-04-29	68.496754
5913	2019-04-30	68.546853

5914 rows × 2 columns

```
In [31]: plot1 = m.plot(forecast)
```



```
In [32]: plot2 = m.plot_components(forecast)
```

