

7. For this problem, use the population dataset, and perform the following:

- 1. EDA on the time series to find trends and seasonality.
- 2. Forecast the population on the given dataset for the next 6 months

```
from fbprophet import Prophet
```

```
import pandas as pd
import numpy as np
```

```
df=pd.read_csv('/content/popdata.csv')
```

```
df.head()
```

	value	date
0	127299.0	1952-01-01
1	127517.0	1952-02-01
2	127721.0	1952-03-01
3	127933.0	1952-04-01
4	128130.0	1952-05-01

+ Code

+ Text

```
df.describe()
```

	value
count	816.000000
mean	214837.767826
std	50519.140567
min	127299.000000
25%	172715.250000
50%	210547.500000
75%	260354.250000
max	301299.946000

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 816 entries, 0 to 815
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype
---  -
 0   value   816 non-null     float64
 1   date    816 non-null     object
dtypes: float64(1), object(1)
memory usage: 12.9+ KB
```

```
columns = df.columns
```

```
df.columns
```

```
Index(['value', 'date'], dtype='object')
```

```
#swap columns in the dataframe
columnsTitles=['date','value']
```

```
df=df.reindex(columns=columnsTitles)
```

```
df.head()
```

	date	value
0	1952-01-01	127299.0
1	1952-02-01	127517.0
2	1952-03-01	127721.0
3	1952-04-01	127933.0
4	1952-05-01	128130.0

```
df.columns=['ds','y']
df.head()
```

	ds	y
0	1952-01-01	127299.0
1	1952-02-01	127517.0
2	1952-03-01	127721.0
3	1952-04-01	127933.0
4	1952-05-01	128130.0

```
#model fit
model=Prophet()
model.fit(df)
```

```
INFO:fbprophet:Disabling weekly seasonality. Run prophet with weekly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with daily_seasonality=True to override this.
<fbprophet.forecaster.Prophet at 0x7f59a7920e10>
```

future\_predction of 6 months or 180days  
future\_dates=model.make\_future\_dataframe(periods=180)

future\_dates

	ds
0	1952-01-01
1	1952-02-01
2	1952-03-01
3	1952-04-01
4	1952-05-01
...	...
991	2020-05-25
992	2020-05-26
993	2020-05-27
994	2020-05-28
995	2020-05-29

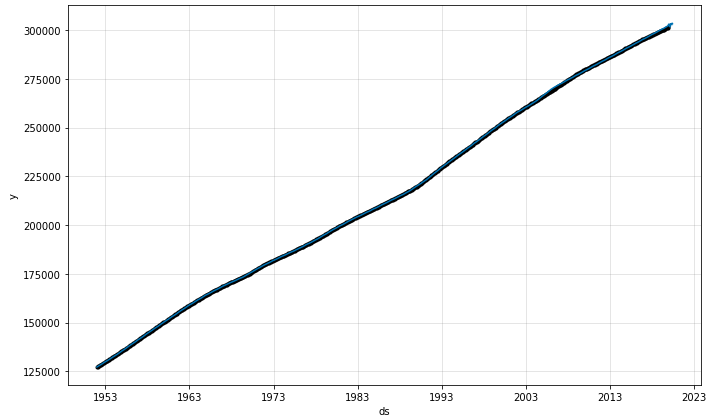
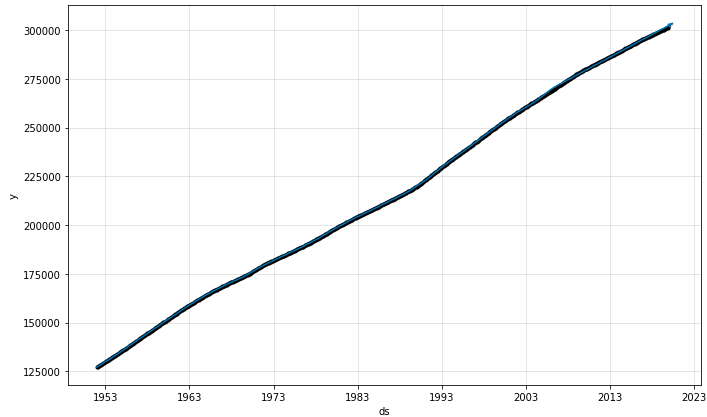
996 rows × 1 columns

##--predction  
future\_predction=model.predict(future\_dates)

future\_predction.head()

	ds	trend	yhat_lower	yhat_upper	trend_lower	trend_upper	additive_terms	additive_terms_lower	additive_terms_upper
0	1952-01-01	127237.775743	126996.390352	127550.117894	127237.775743	127237.775743	43.820000	43.820000	43.820000
1	1952-02-01	127467.066588	127193.791709	127788.327161	127467.066588	127467.066588	23.119322	23.119322	23.119322
2	1952-03-01	127681.564475	127388.455963	127972.879825	127681.564475	127681.564475	-6.247950	-6.247950	-6.247950
3	1952-04-01	127910.855320	127562.692213	128169.791661	127910.855320	127910.855320	-38.939724	-38.939724	-38.939724
4	1952-05-01	128132.749685	127750.561375	128364.021220	128132.749685	128132.749685	-63.284843	-63.284843	-63.284843

#ploting the predction  
model.plot(future\_predction)



#visuval plot  
model.plot\_components(future\_predction)

