```
import pandas as pd
import numpy as np
from fbprophet import Prophet
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
import plotly as pt
from sklearn.metrics import mean_squared_error
from statsmodels.tools.eval_measures import rmse
import warnings
warnings.filterwarnings("ignore")


data = pd.read_excel(r'POCM_HISTORICAL.xlsx')
df1 = data[["Checkout_Date","Order_Quantity"]]


df1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 160577 entries, 0 to 160576
Data columns (total 2 columns):
 #   Column          Non-Null Count   Dtype
---  ------          --------------   -----
 0   Checkout_Date   160577 non-null  datetime64[ns]
 1   Order_Quantity  160577 non-null  int64
dtypes: datetime64[ns](1), int64(1)
memory usage: 2.5 MB
```

```
df1
```

	Checkout_Date	Order_Quantity
0	2018-12-04	1
1	2018-12-04	1
2	2018-12-05	5
3	2018-12-05	10
4	2018-12-05	20
...	...	...
160572	2020-05-15	5
160573	2020-05-15	20

```
df = df1.groupby(["Checkout_Date"])['Order_Quantity'].sum().reset_index()
df.tail()
```

	Checkout_Date	Order_Quantity
465	2020-05-11	2749
466	2020-05-12	3366
467	2020-05-13	1491
468	2020-05-14	6631
469	2020-05-15	1018

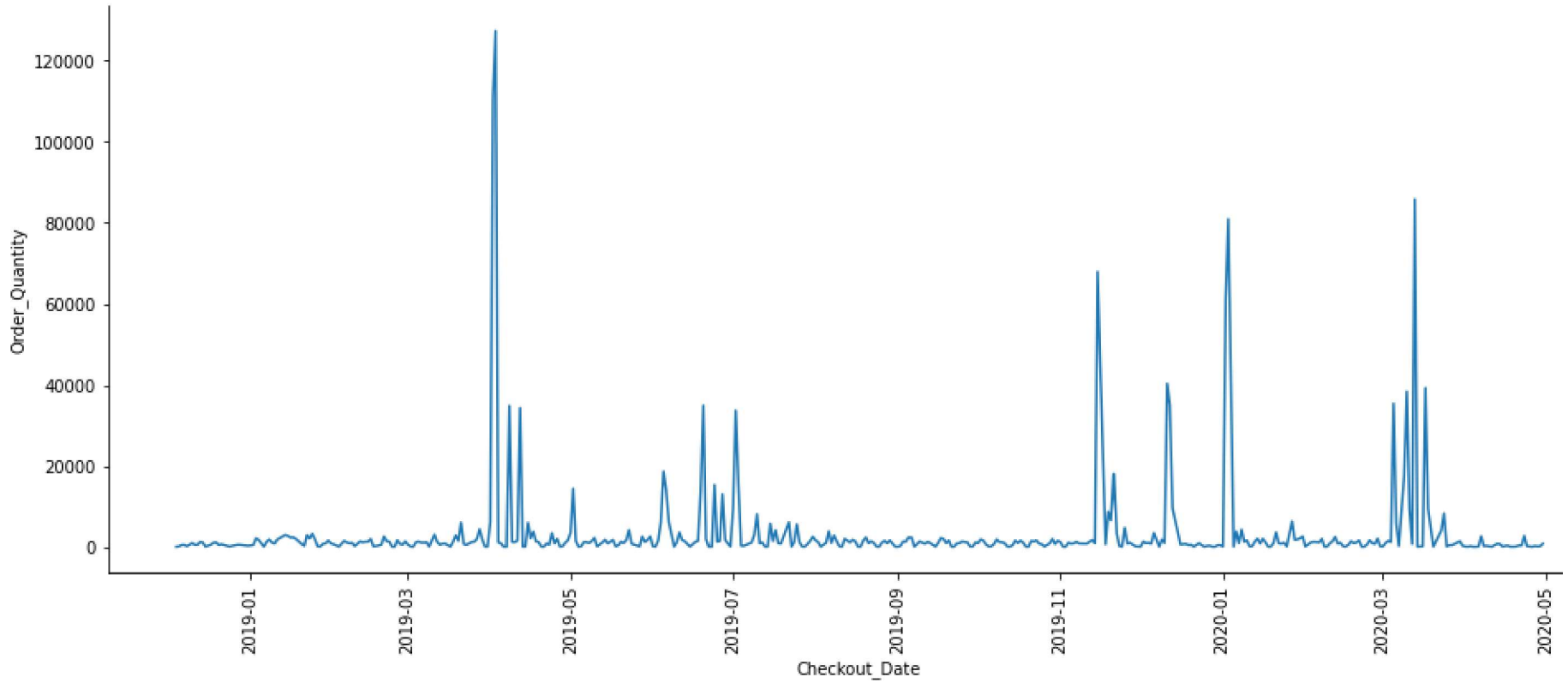
```
#selecting a time specific data, we can consider it as our train data
daily1 = df.loc[df['Checkout_Date'].between('2018-12-04','2020-04-30', inclusive=True)]

#we can consider it as test data after training and getting prediction of the previous data.
daily2 = df.loc[df['Checkout_Date'].between('2020-05-01','2020-05-15', inclusive=True)]


daily1.tail()
```

	ds	y
454	2020-04-26	2
455	2020-04-27	170
456	2020-04-28	78
457	2020-04-29	115
458	2020-04-30	750

```
sns.relplot(x = 'Checkout_Date', y = 'Order_Quantity', data = daily1, kind = 'line', height = 5.5, aspect = 2.5)
plt.xticks(rotation='vertical')
plt.show()
```



```
model = Prophet()
daily1.columns = ['ds', 'y']
```

```
daily1.tail()
```

	ds	y
454	2020-04-26	2
455	2020-04-27	170
456	2020-04-28	78
457	2020-04-29	115
458	2020-04-30	750

```
model = model.fit(daily1)
```

```
INFO:fbprophet:Disabling yearly seasonality. Run prophet with yearly_seasonality=True to override this.
INFO:fbprophet:Disabling daily seasonality. Run prophet with daily_seasonality=True to override this.
```

```
future = model.make_future_dataframe(periods= 15)
future.tail()
```

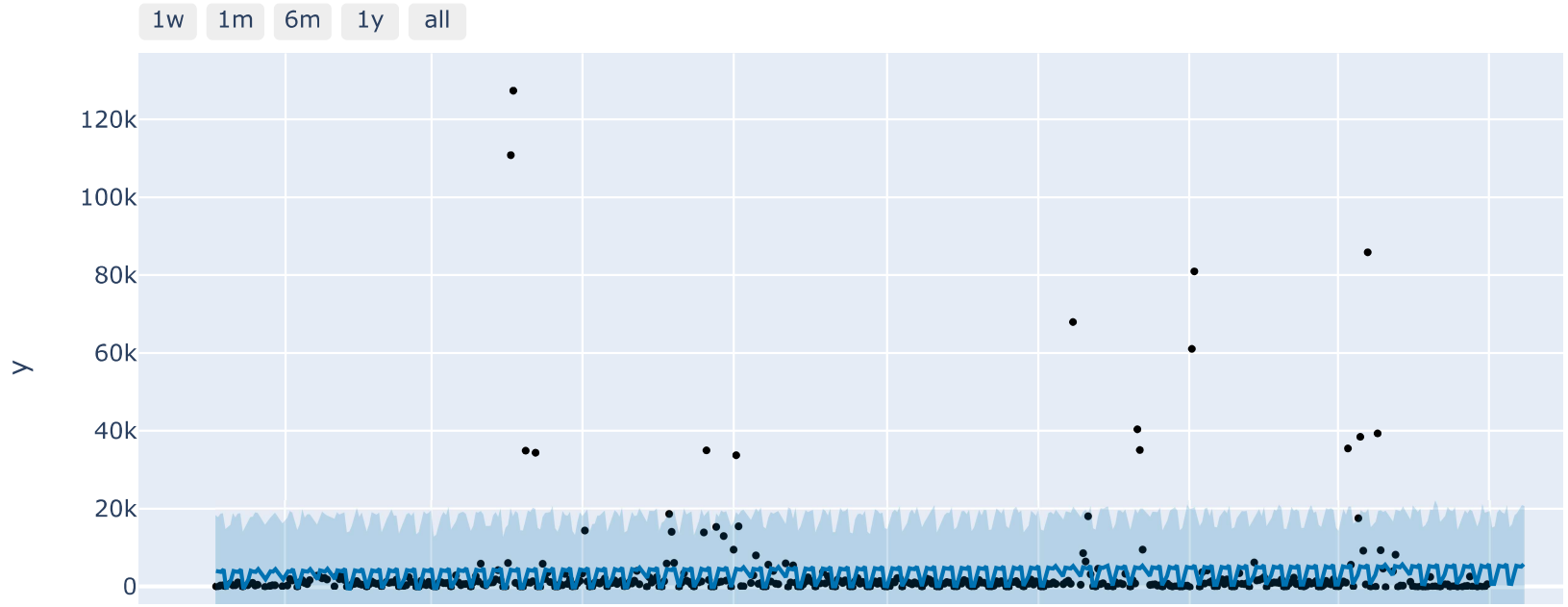
	ds
469	2020-05-11
470	2020-05-12
471	2020-05-13
472	2020-05-14
473	2020-05-15

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

	ds	trend	yhat_lower	yhat_upper	trend_lower	trend_upper	additive_terms	additive_terms_lower	adc
469	2020-05-11	3656.899539	-10716.160561	18244.981180	3656.870981	3656.931046	-583.424374	-583.424374	
470	2020-05-12	3659.399482	-9669.415555	18828.306724	3659.364802	3659.435262	1648.870184	1648.870184	
471	2020-05-13	3661.899425	-8867.285475	19572.495283	3661.853154	3661.942083	1471.131418	1471.131418	
472	2020-05-14	3664.399367	-9657.396345	20864.139435	3664.346838	3664.449569	1388.198489	1388.198489	
473	2020-05-15	3666.899310	-9453.904577	20583.584990	3666.837808	3666.954865	2039.183785	2039.183785	

```
from fbprophet.plot import plot_plotly, plot_components_plotly

plot_plotly(model, forecast)
```




```
plot_components_plotly(model, forecast)
```

```
f1 = forecast.loc[forecast['ds'].between('2020-05-01','2020-05-15', inclusive=True)][['ds', 'yhat']]
f1 = f1.set_index('ds')
f1 = f1[(f1.index.dayofweek < 5)]
f1
```

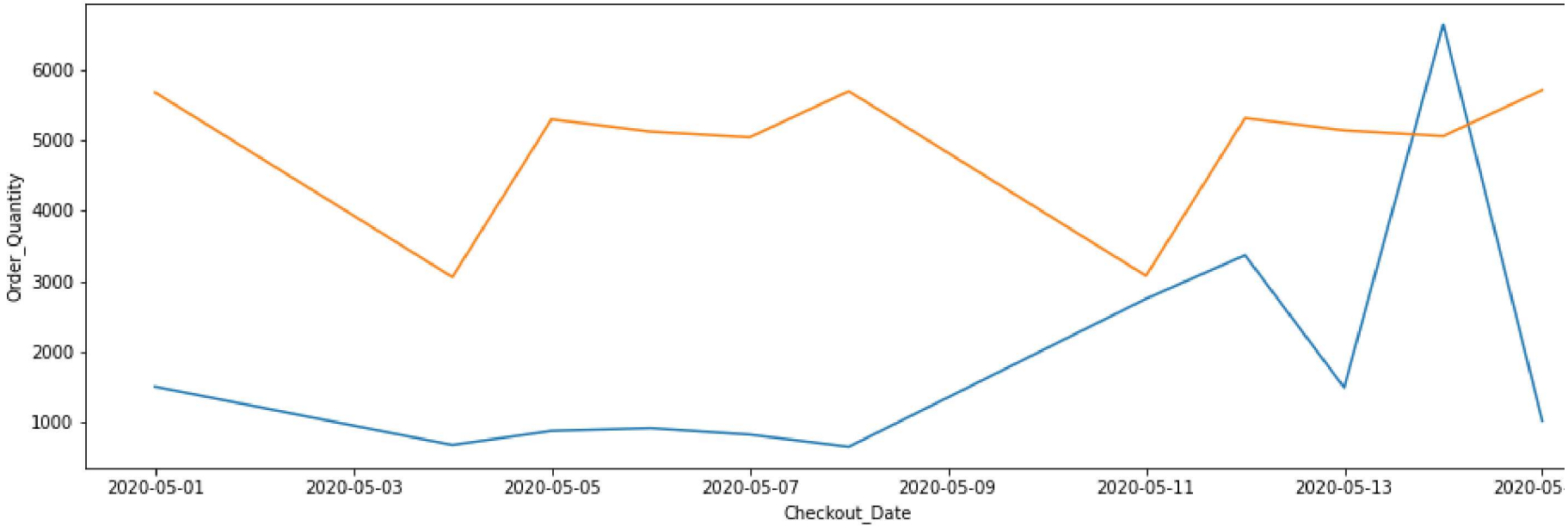
ds	yhat
2020-05-01	5671.083898
2020-05-04	3055.975567
2020-05-05	5290.770068
2020-05-06	5115.531245
2020-05-07	5035.098258
2020-05-08	5688.583497
2020-05-11	3073.475165
2020-05-12	5308.269666
2020-05-13	5133.030843
2020-05-14	5052.597856
2020-05-15	5706.083095

```
#Comparing the forecasted and original data plots

plt.figure(figsize=(16,5))
```

```
sns.lineplot(x= daily2['Checkout_Date'], y= daily2["Order_Quantity"])
sns.lineplot(x= f1.index, y = f1.yhat)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f009317ca90>
```




```
# Checking Evaluation/Performance Metrics

prophet_rmse_error = rmse(daily2['Order_Quantity'], f1["yhat"])
prophet_mse_error = prophet_rmse_error**2
mean_value = df['Order_Quantity'].mean()

print(f'MSE Error: {prophet_mse_error}\nRMSE Error: {prophet_rmse_error}\nMean: {mean_value}')
```

```
MSE Error: 13166503.243065955
RMSE Error: 3628.5676572259135
Mean: 3314.923404255319
```