

AUTOREGRESSIVE

ANALYSIS

ENERGY CONSUMPTION OF APPLIANCES

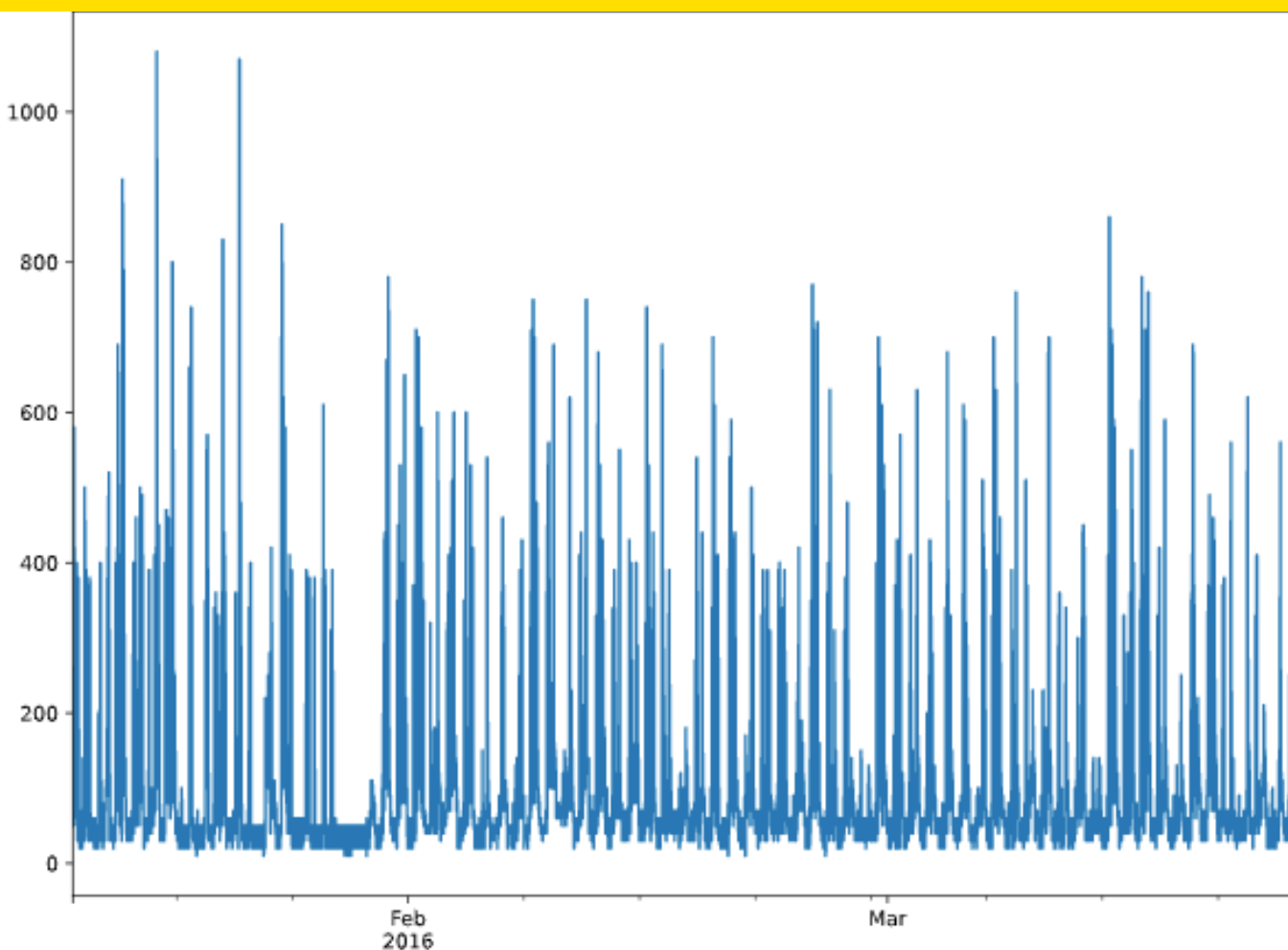
ASSIGNMENT #1

BY-YOHANNIS KIFLE TELILA

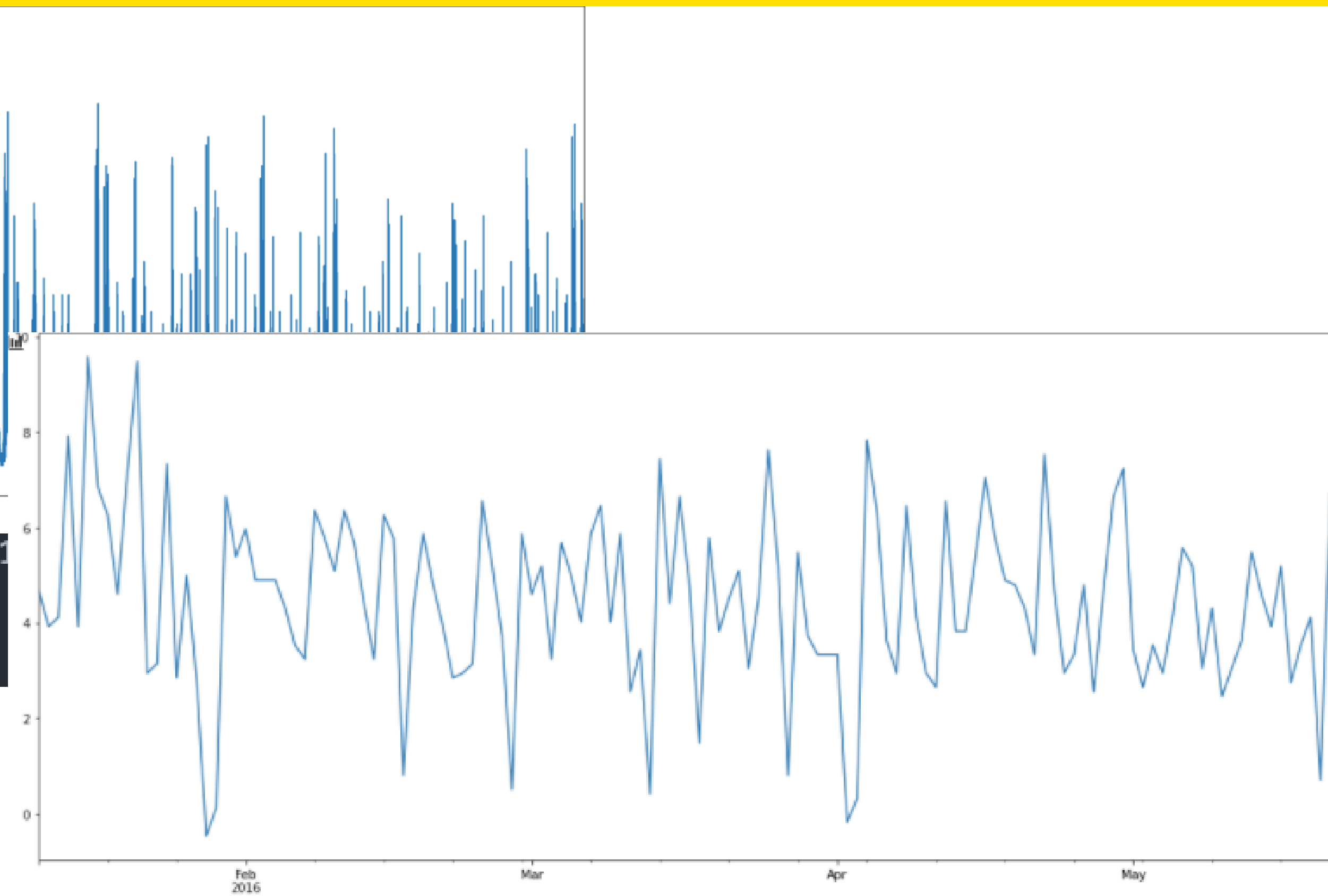
29 MAR



PRE-PROCESSING



```
ADF Test Statistic : -21.6163781980361  
p-value : 0.0  
#Lags Used : 11  
Number of Observations Used : 19723
```



TRAINING

```
[13] ▶ MI  
autoModel = auto_arima(trainArima, trace=True, max_P=30, max_D=5, max_q=5, seasonal=False)
```

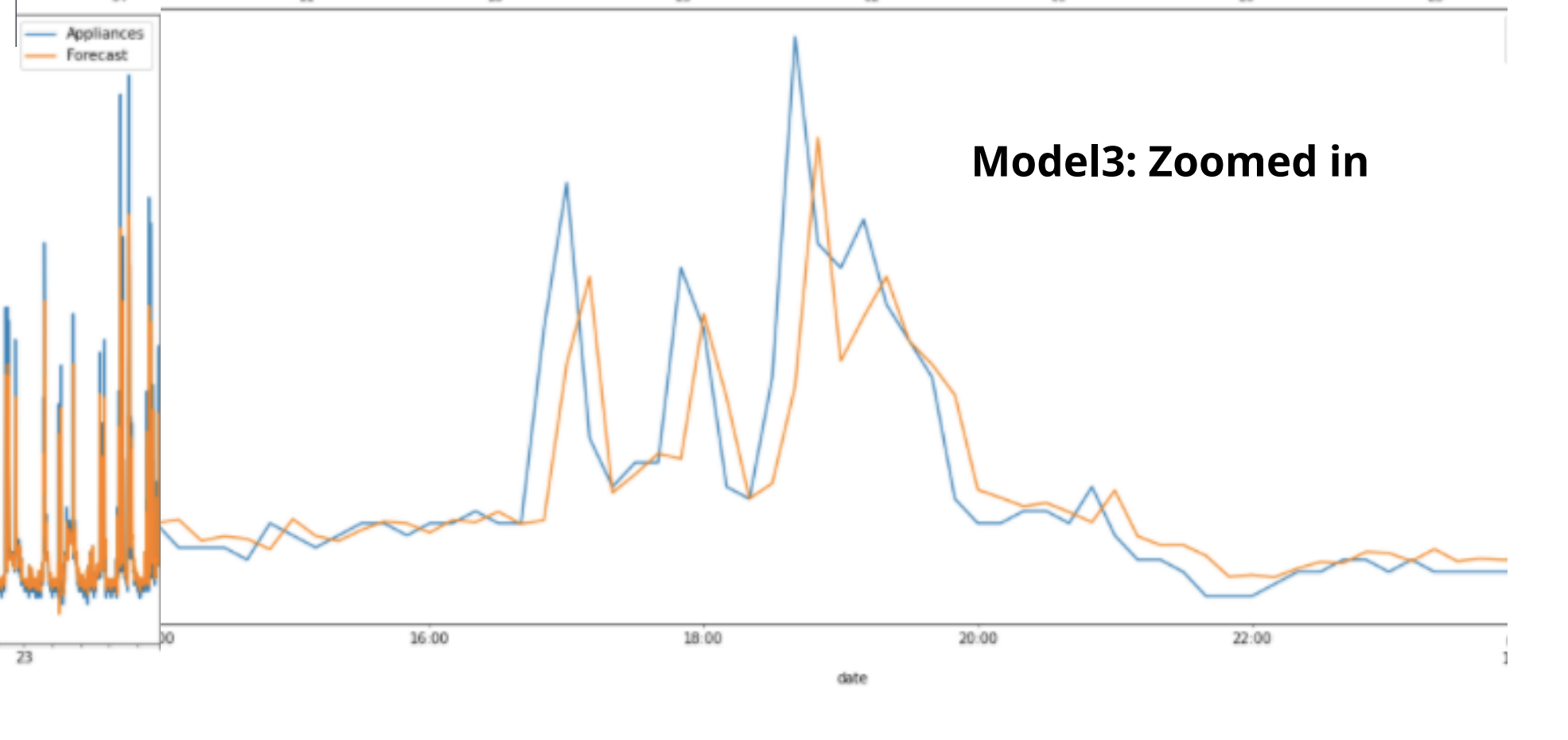
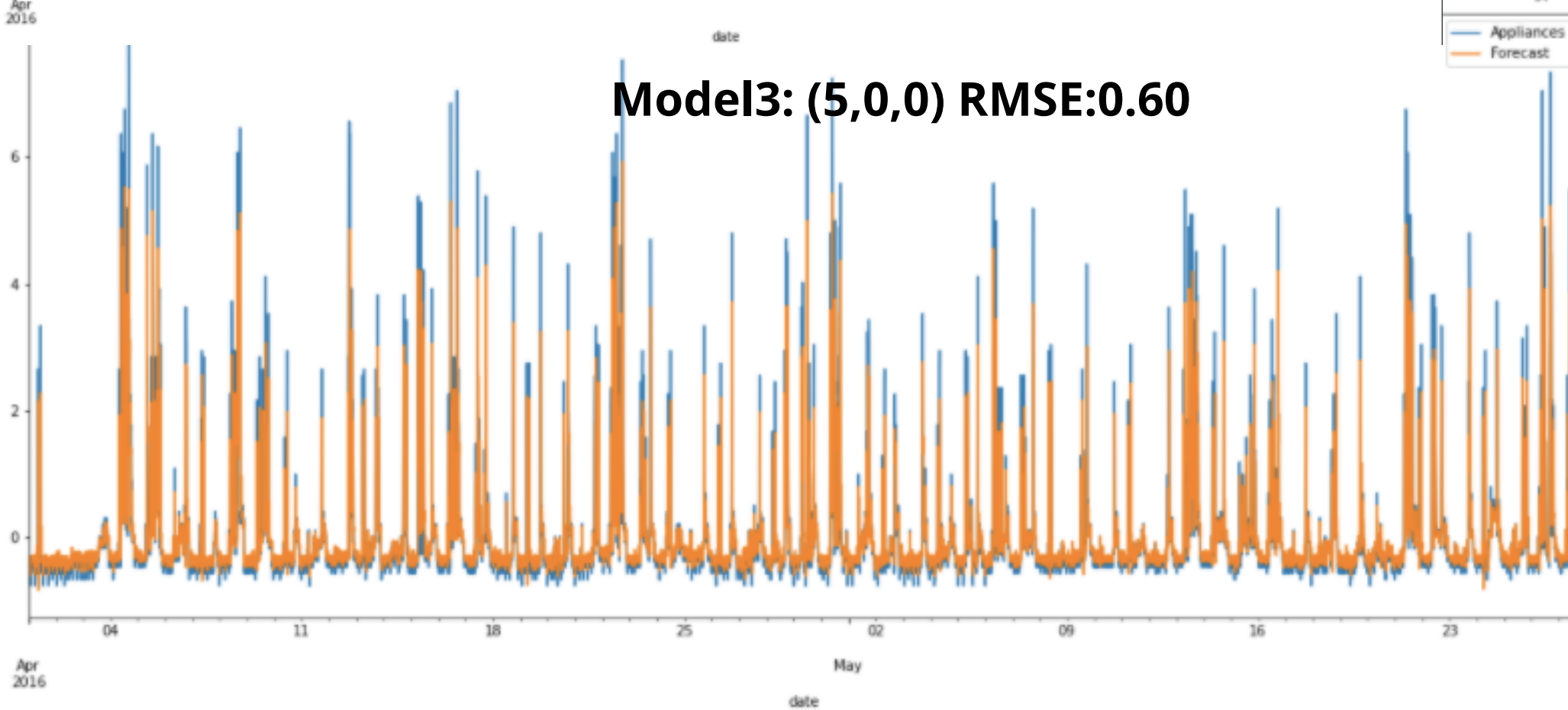
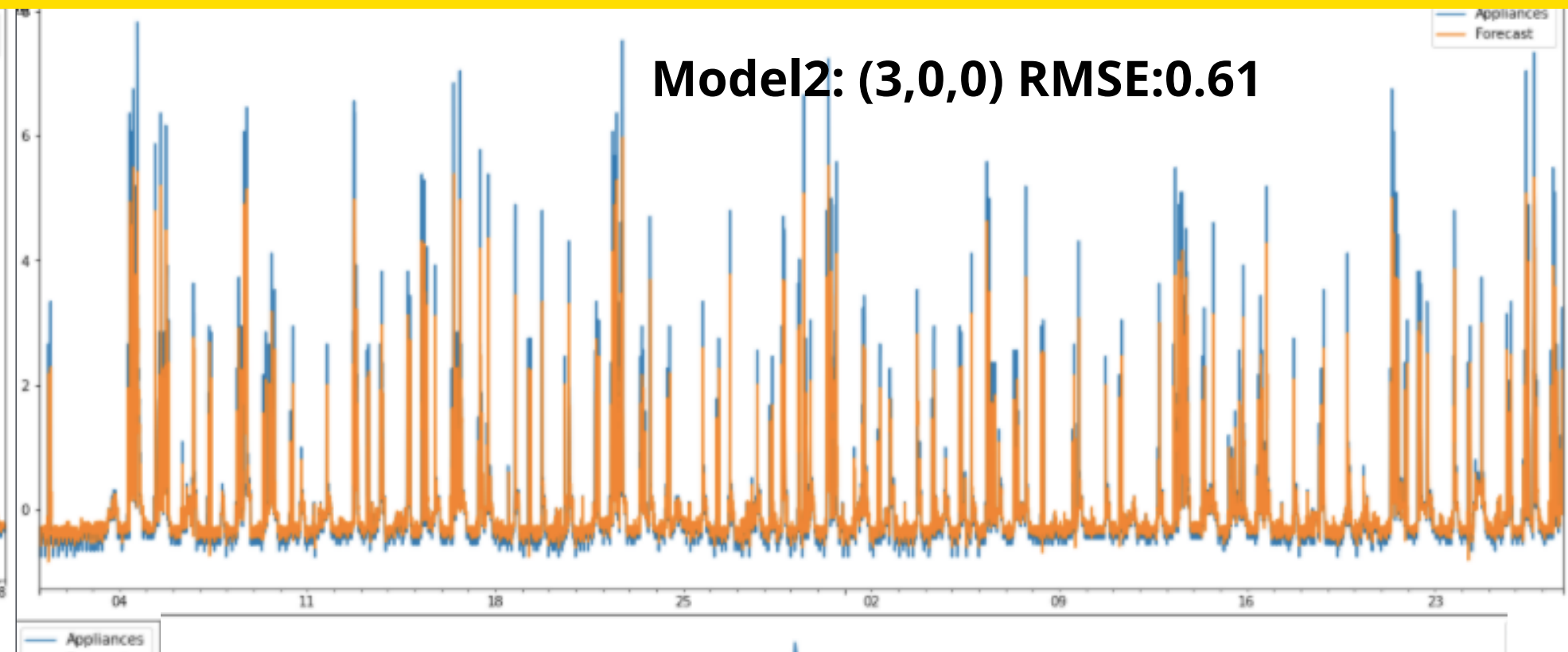
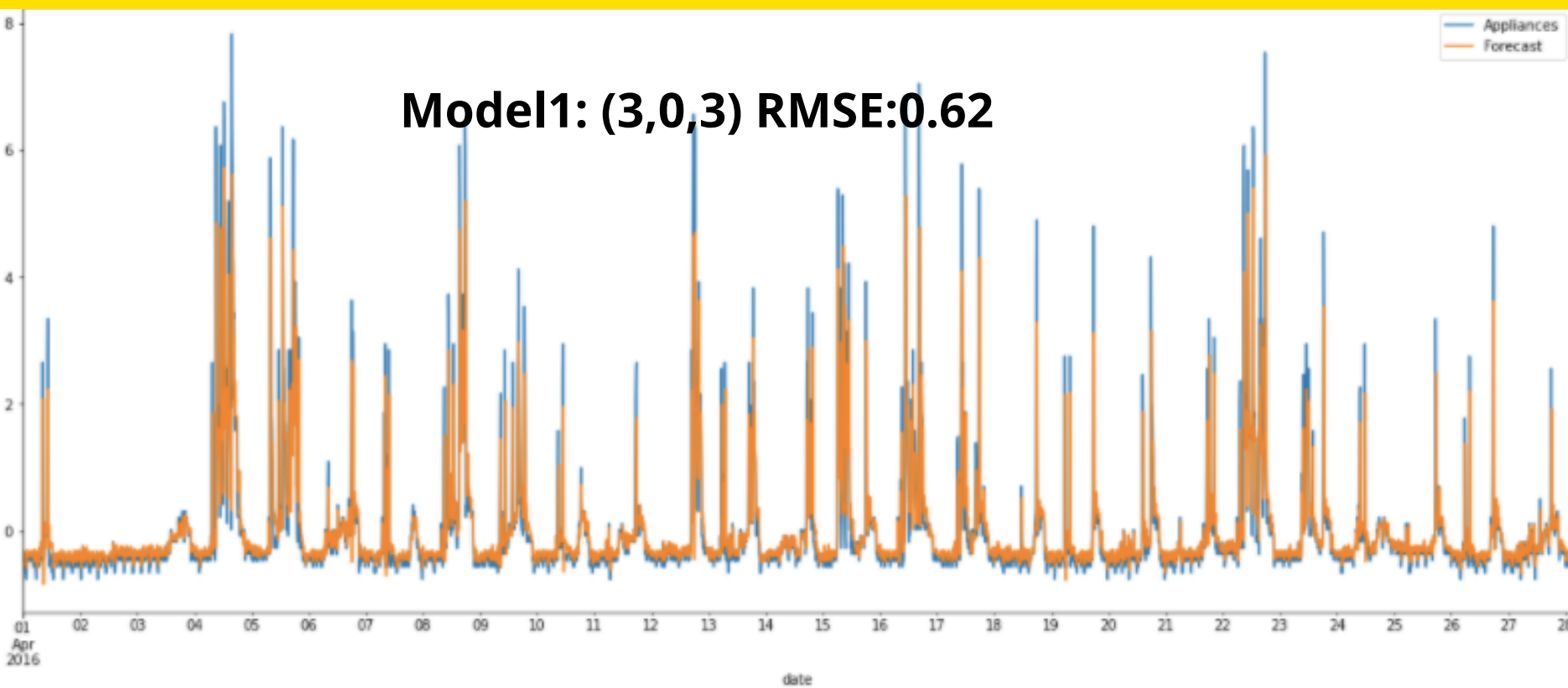
```
ARIMA(2,0,1)(0,0,0)[0] : AIC=23803.063, Time=2.65 sec  
ARIMA(3,0,2)(0,0,0)[0] : AIC=23513.131, Time=8.58 sec  
ARIMA(3,0,1)(0,0,0)[0] : AIC=23514.063, Time=6.06 sec  
ARIMA(4,0,2)(0,0,0)[0] : AIC=23514.389, Time=14.13 sec  
ARIMA(3,0,3)(0,0,0)[0] : AIC=23507.987, Time=13.53 sec  
ARIMA(2,0,3)(0,0,0)[0] : AIC=23513.949, Time=6.51 sec  
ARIMA(4,0,3)(0,0,0)[0] : AIC=23511.961, Time=17.00 sec  
ARIMA(3,0,4)(0,0,0)[0] : AIC=23510.741, Time=17.02 sec  
ARIMA(2,0,4)(0,0,0)[0] : AIC=inf, Time=34.15 sec  
ARIMA(4,0,4)(0,0,0)[0] : AIC=23522.797, Time=12.75 sec  
ARIMA(3,0,3)(0,0,0)[0] intercept : AIC=23511.650, Time=32.65 sec
```

```
Best model: ARIMA(3,0,3)(0,0,0)[0]  
Total fit time: 173.035 seconds
```

```
model = ARIMA(trainArima, order=(3,0,3))  
model_fit = model.fit()  
model_fit.summary()
```

```
SARIMAX Results  
Dep. Variable:    Appliances  No. Observations:    11559  
Model:    ARIMA(3, 0, 3)    Log Likelihood    -11746.973  
Date:    Wed, 24 Mar 2021    AIC    23509.946  
Time:    19:23:17    BIC    23568.788
```

RESULTS



END

References

- <https://www.statsmodels.org/stable/generated/statsmodels.tsa.arima.model.ARIMA.html>
- https://alkaline-ml.com/pmdarima/user_guide.html#user-guide
- <https://www.kaggle.com/c/web-traffic-time-series-forecasting/discussion/43795>
- <https://docs.python.org/3/library/datetime.html#strptime-and-strftime-behavior>
- <https://www.kaggle.com/timmate/autoregressive-model>

 github.com/joekifle