

# TP Final

Análisis de Series Temporales

Florencia Priscilla Vela

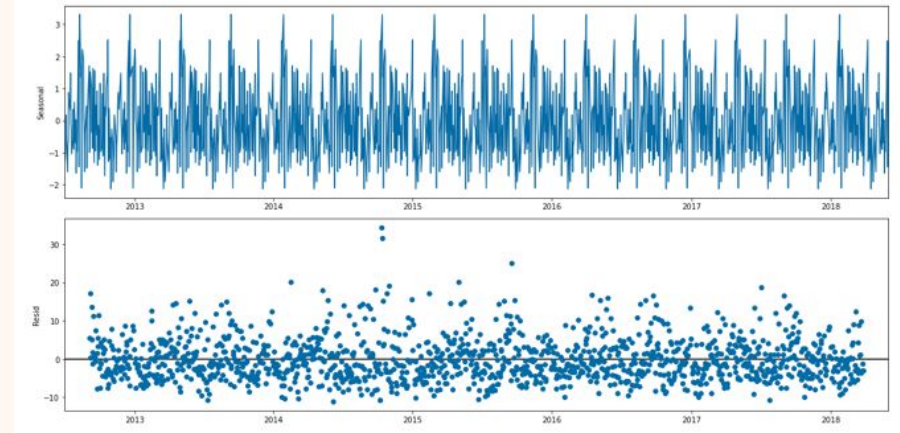
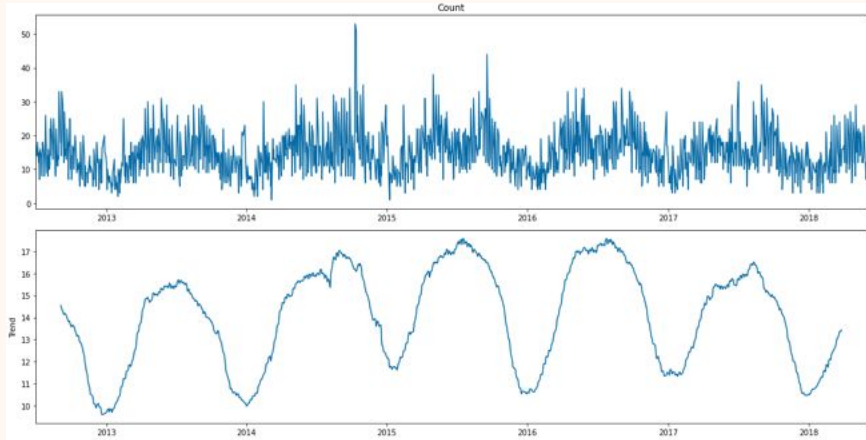


# Marriages

- Guilford County Register
- 2012 - 2018

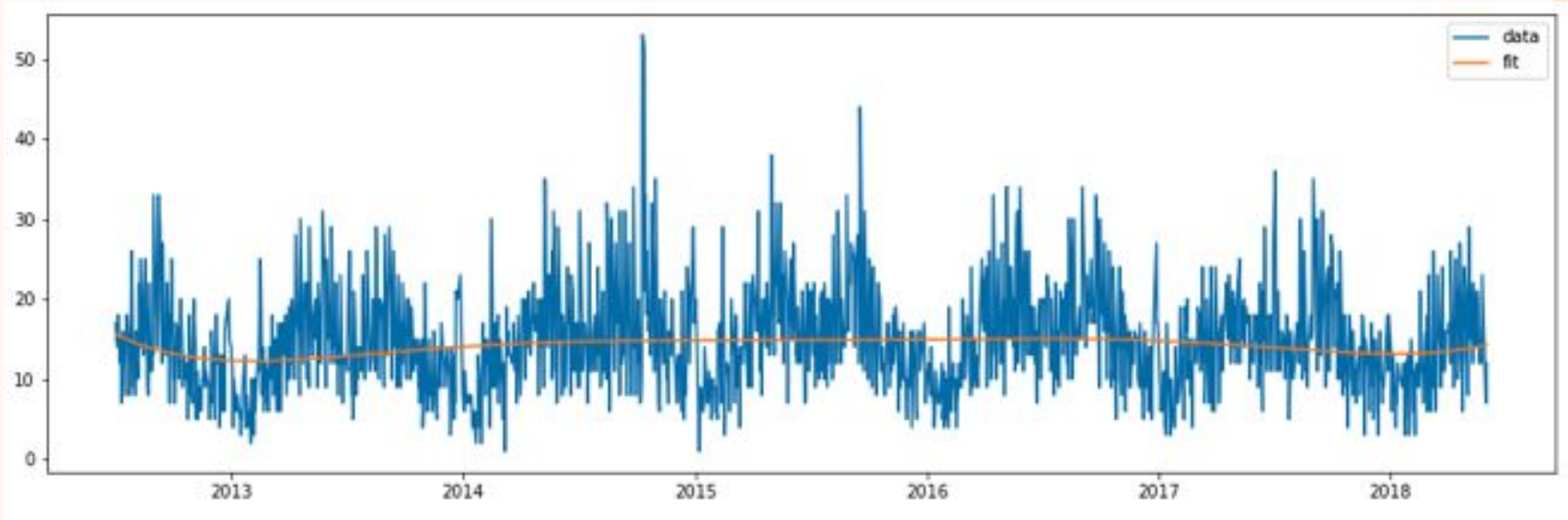


# Descomponiendo con el modelo aditivo de cuatro componentes



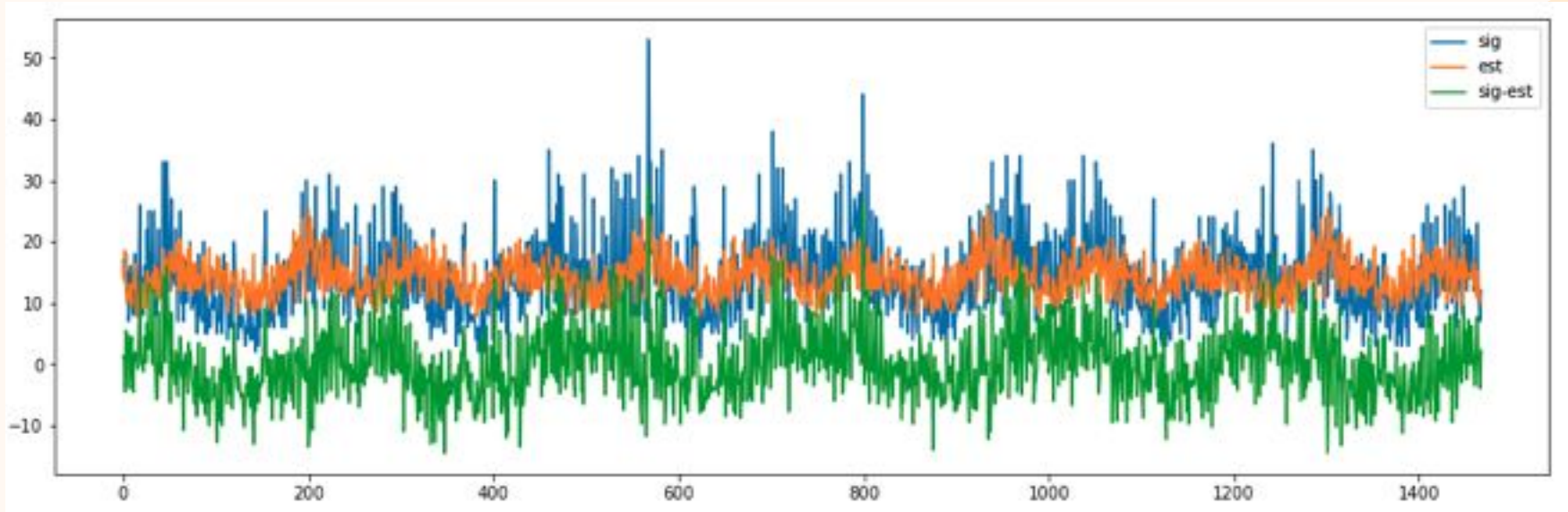
# Modelo Deterministico

Con polyfit de grado 6



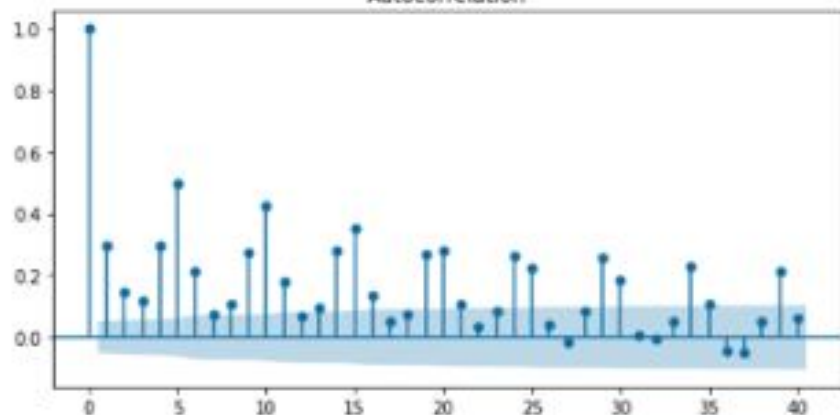
# Modelo Deterministico

N=365 dias

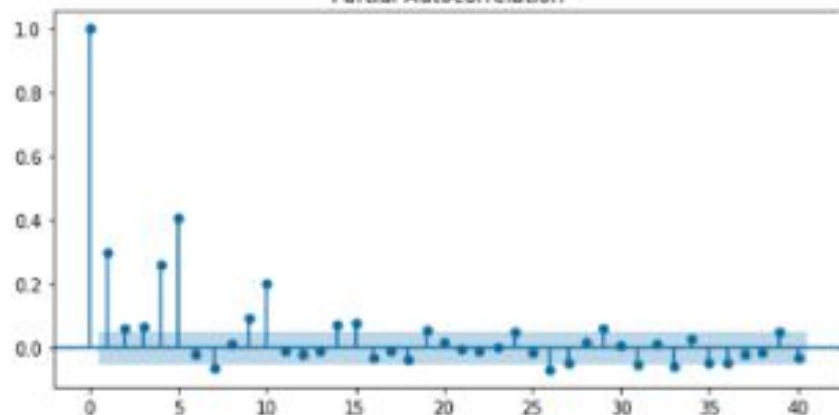


# Estacionariedad

Autocorrelation



Partial Autocorrelation



```
1 adfuller(df)
```

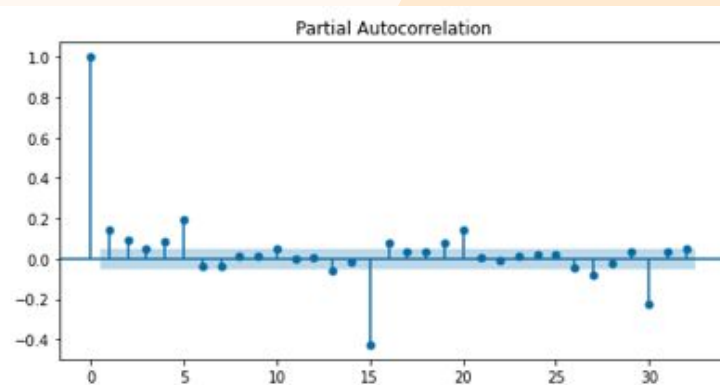
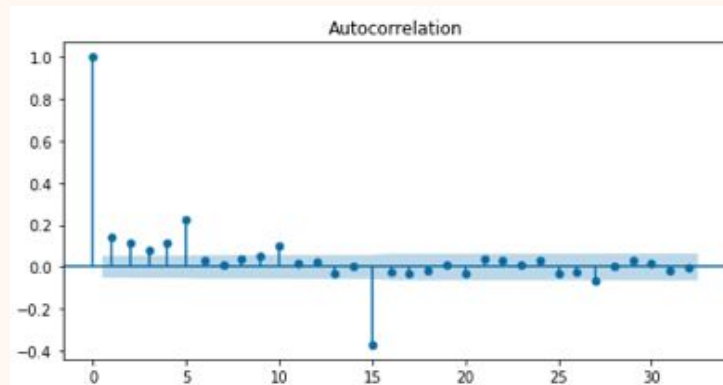
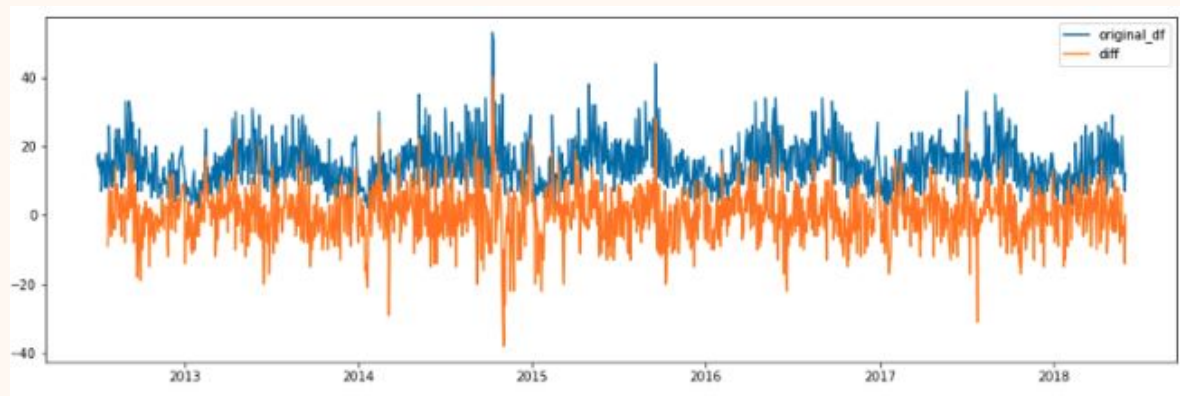
```
(-4.556225434673008,  
0.00015541750711865724,  
18,  
1449,  
{'1%': -3.4348709954268384,  
'5%': -2.863536715724964,  
'10%': -2.567833035595811},  
8863.203639985491)
```

```
1 kpss(df)
```

```
(0.14876840210703635,  
0.1,  
24,  
{'10%': 0.347, '5%': 0.463, '2.5%': 0.574, '1%': 0.739})
```

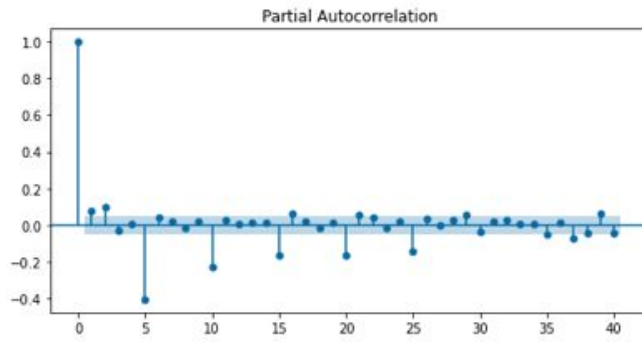
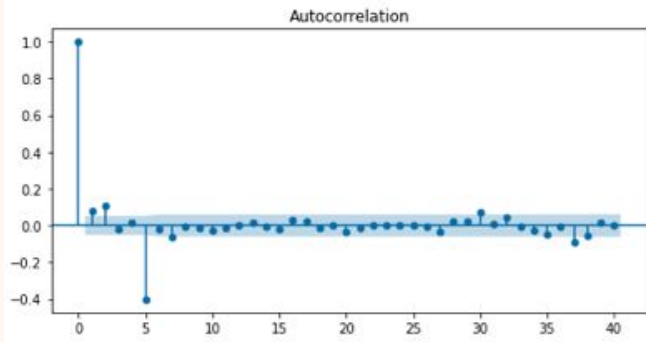
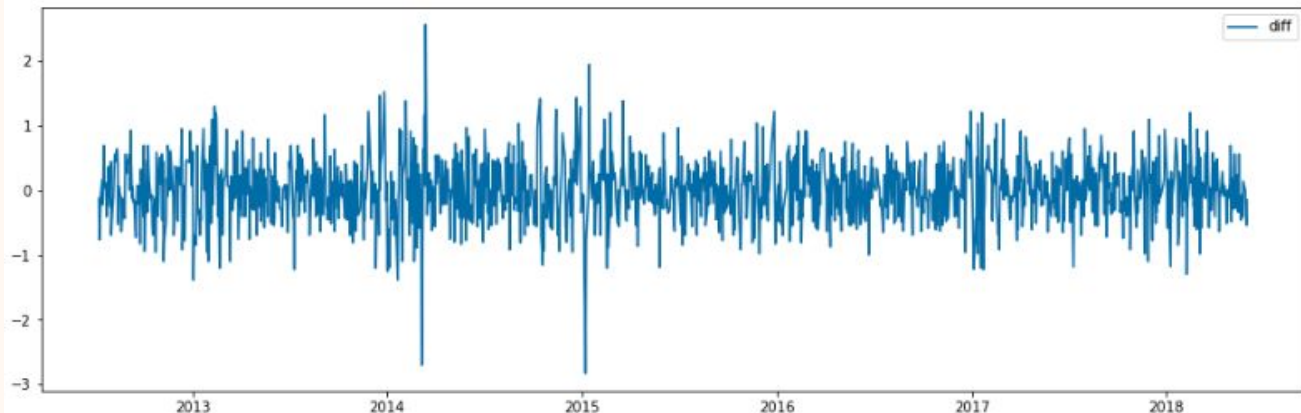
# Preprocesamiento

Diferenciando con 15 días



# Preprocesamiento

Diferenciando  
con 5 días!!







03

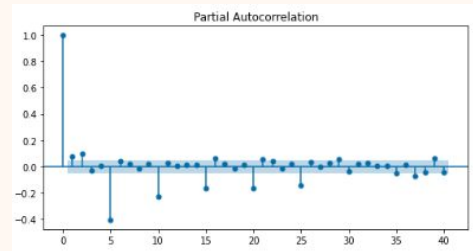
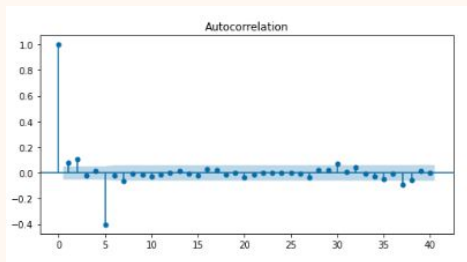
# Modelos Propuestos



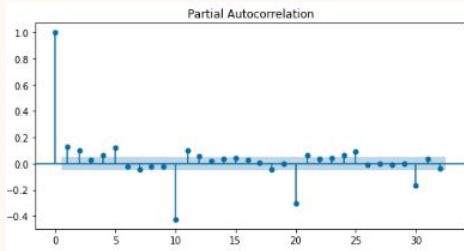
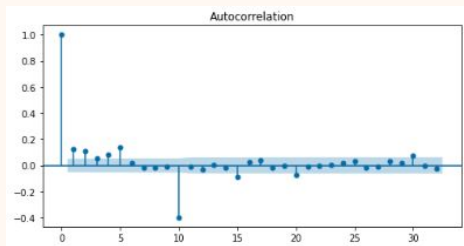
# Modelos Propuestos



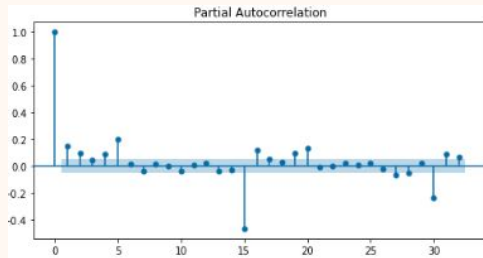
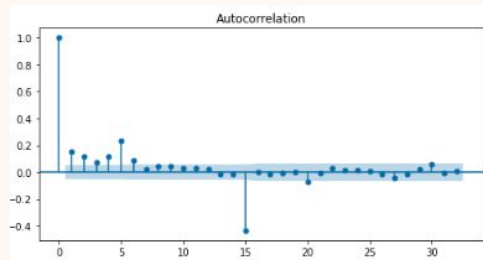
order=(2,0,2),  
seasonal\_order=  
(0,1,0,5)



order=(5,0,5),  
seasonal\_order=  
(0,1,2,10)



order=(6,0,5),  
seasonal\_order=  
(0,1,5,15)



# Modelos Propuestos

order=(2,0,2),  
seasonal\_order=  
(0,1,0,5)

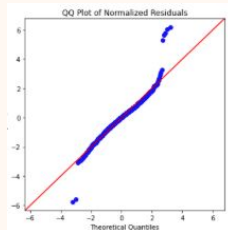
**AIC** 1753.933

**BIC** 1780.374

Ljung-Box (L1) (Q): 2.42 Jarque-Bera (JB): 255.92

Prob(Q): 0.12 Prob(JB): 0.00

**Kurtosis:** 4.89



order=(5,0,5),  
seasonal\_order=  
(0,1,2,10)

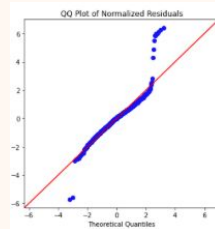
**AIC** 1466.096

**BIC** 1534.799

Ljung-Box (L1) (Q): 0.70 Jarque-Bera (JB): 411.49

Prob(Q): 0.40 Prob(JB): 0.00

**Kurtosis:** 5.29



order=(6,0,5),  
seasonal\_order=  
(0,1,5,15)

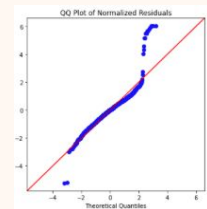
**AIC** 1474.964

**BIC** 1564.748

Ljung-Box (L1) (Q): 0.00 Jarque-Bera (JB): 346.45

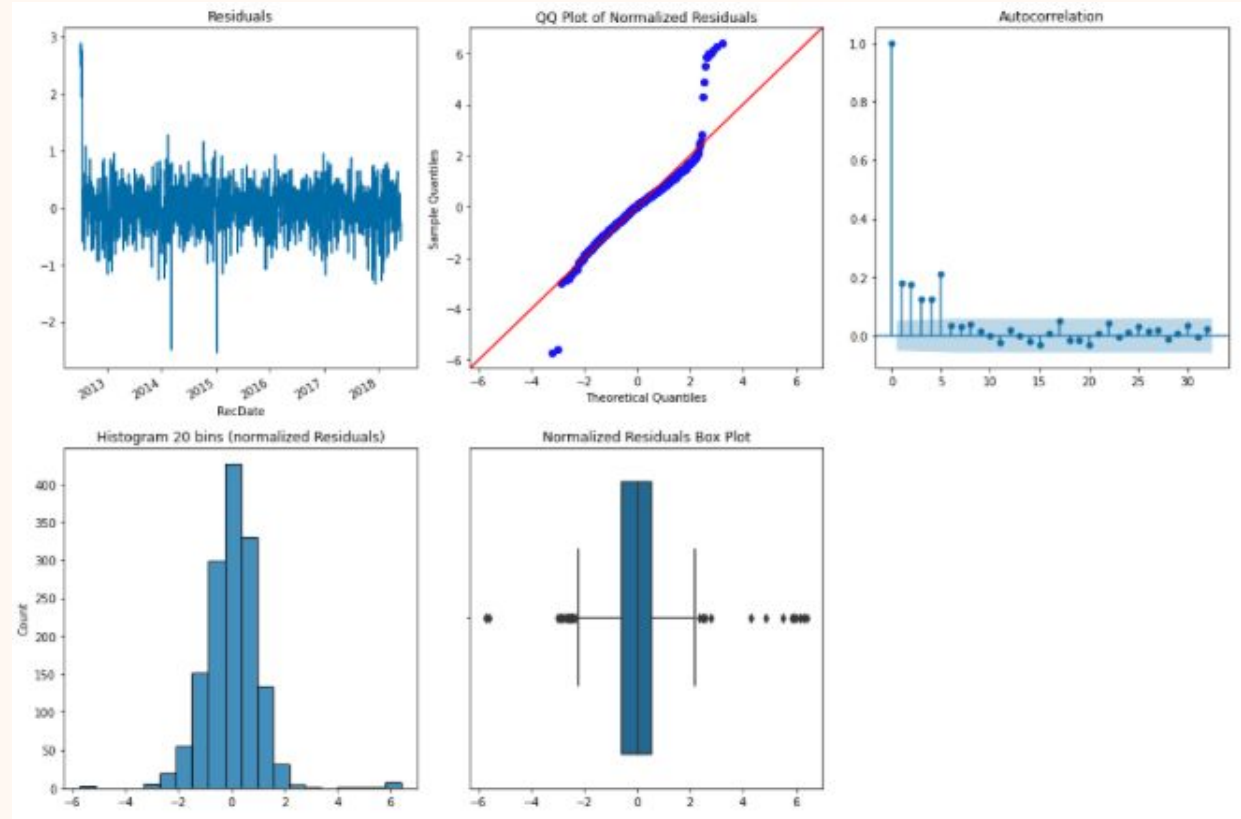
Prob(Q): 0.99 Prob(JB): 0.00

**Kurtosis:** 5.08

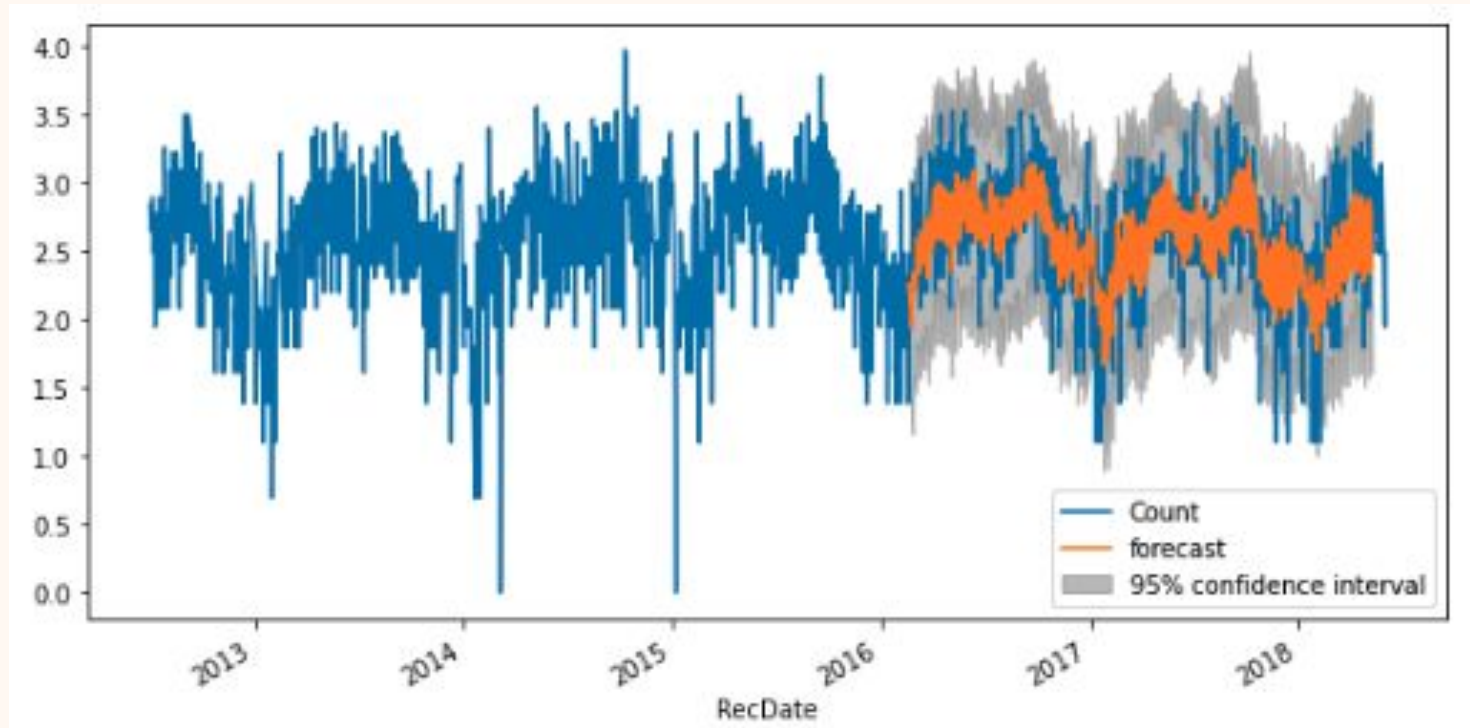


# Modelo Elegido

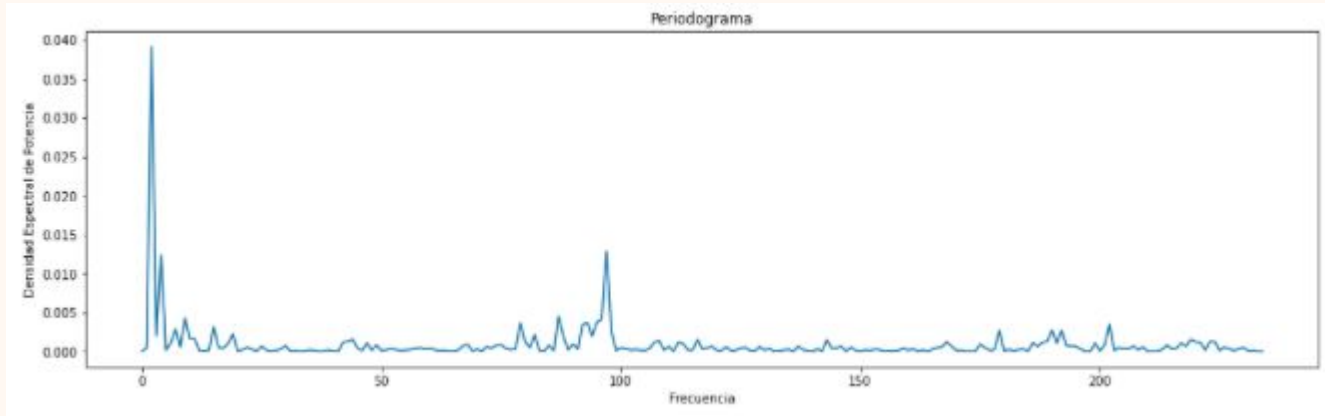
`order=(5,0,5),`  
`seasonal_order=`  
`(0,1,2,10)`



# Predicciones



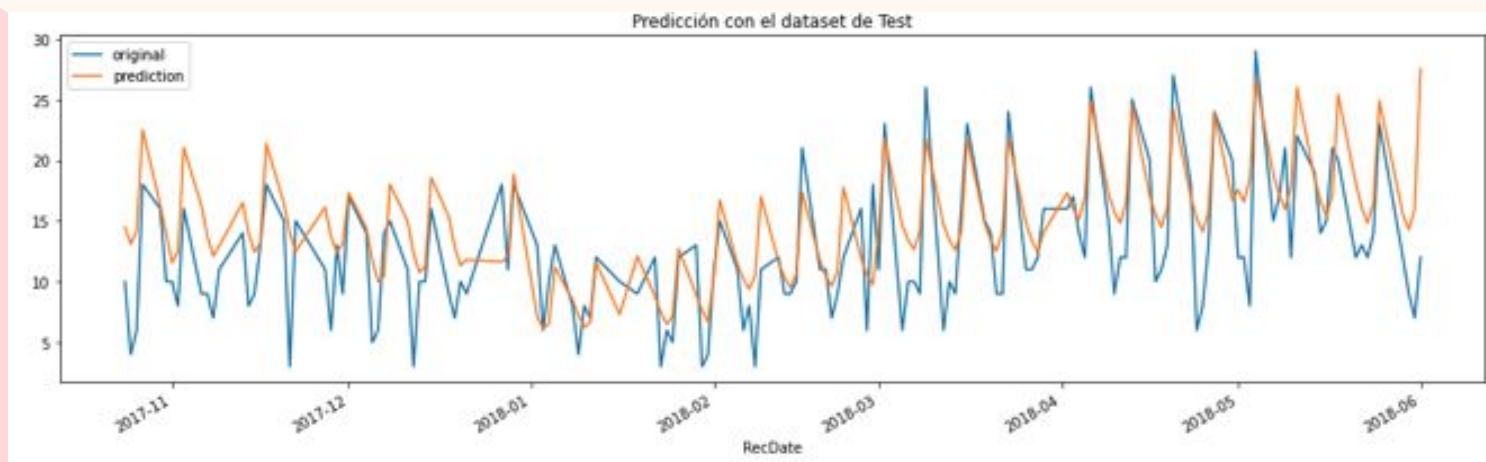
# Análisis Espectral



Pico muy grande en 235 (makes sense!)

Segundo pico en 5

# LSTM



```
LSTM(4, 64, num_layers=3, batch_first=True, dropout=0.2)
```

## Args:

`input_dim (int)`: The number of nodes in the input layer  
`hidden_dim (int)`: The number of nodes in each layer  
`layer_dim (int)`: The number of layers in the network  
`output_dim (int)`: The number of nodes in the output layer  
`dropout_prob (float)`: The probability of nodes being dropped out



Gracias!