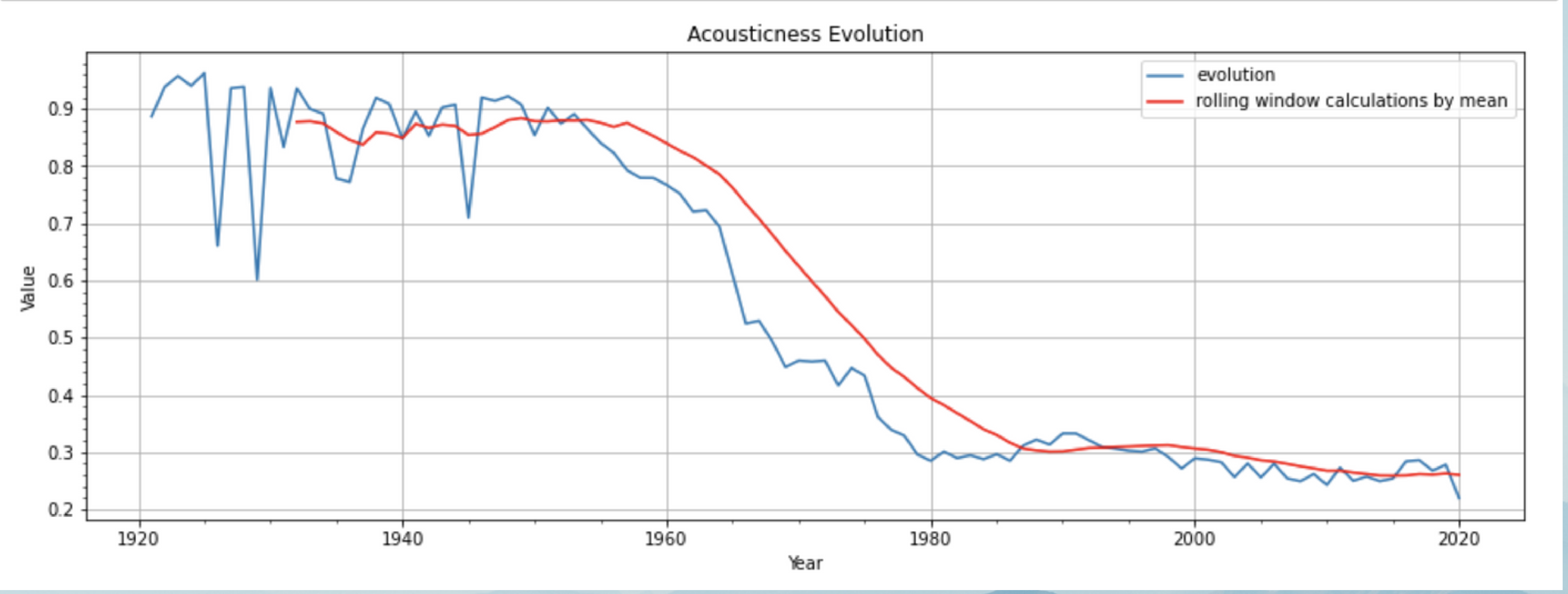
Análisis de la historia contemporánea de la música

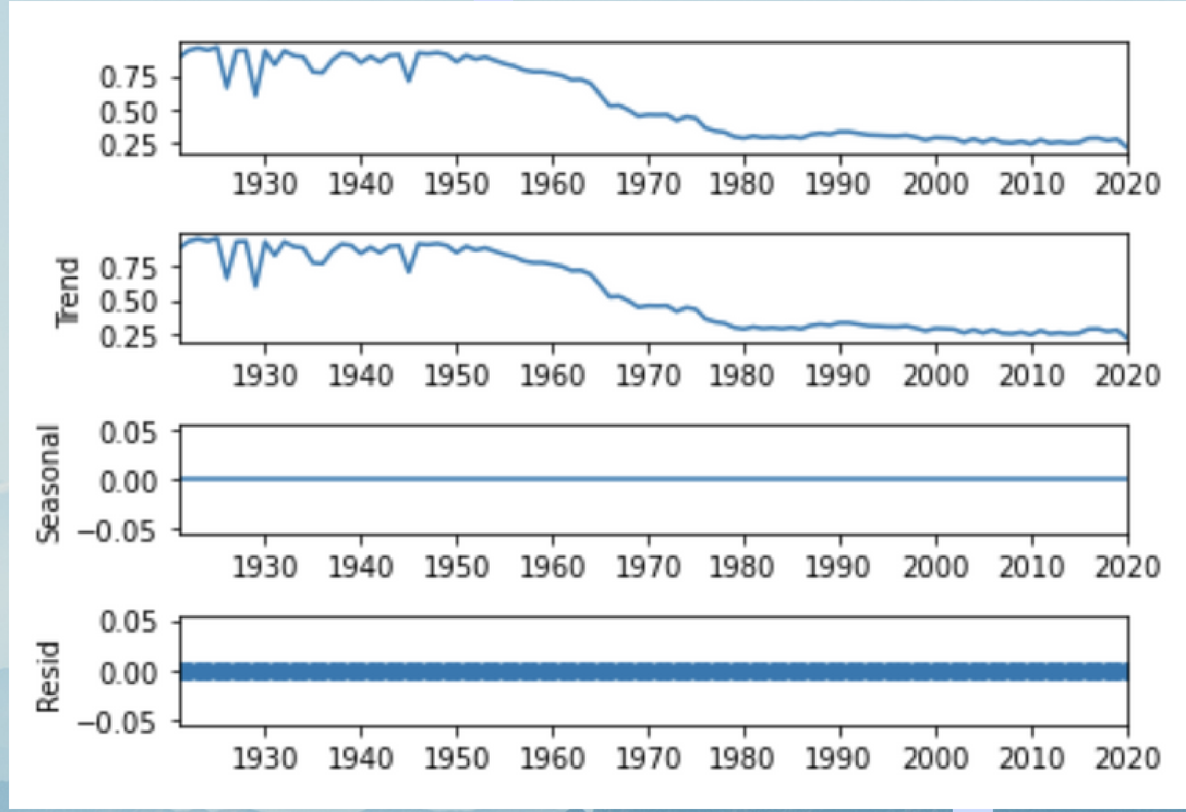
Time Series Forecasting - ARIMA (Autoregressive Integrated Moving Average Model)

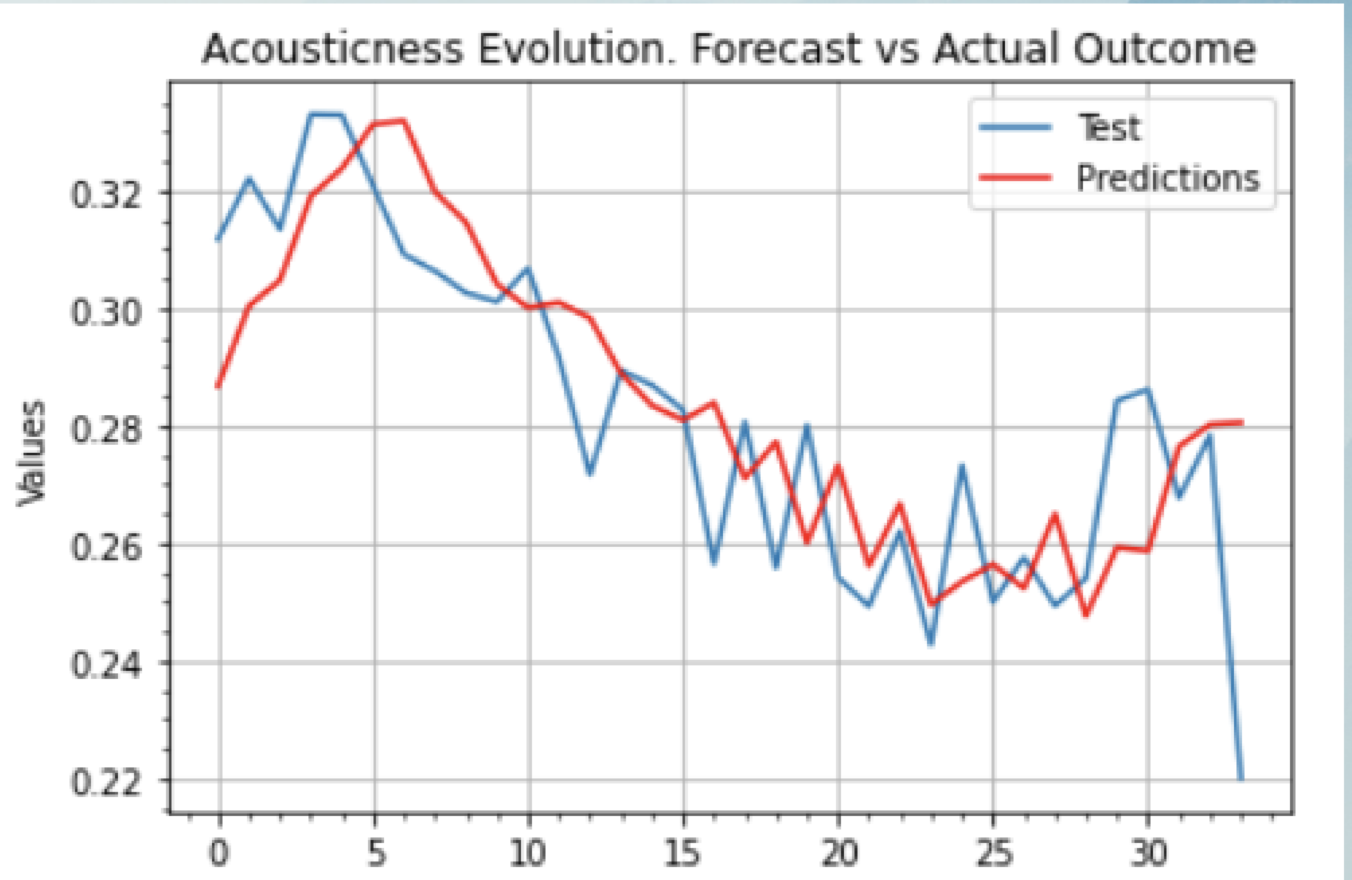
Parámetros analizados:

- Acousticness
- Danzability
- Loudness
- Energy

Accousticness







Test RMSE: 0.018

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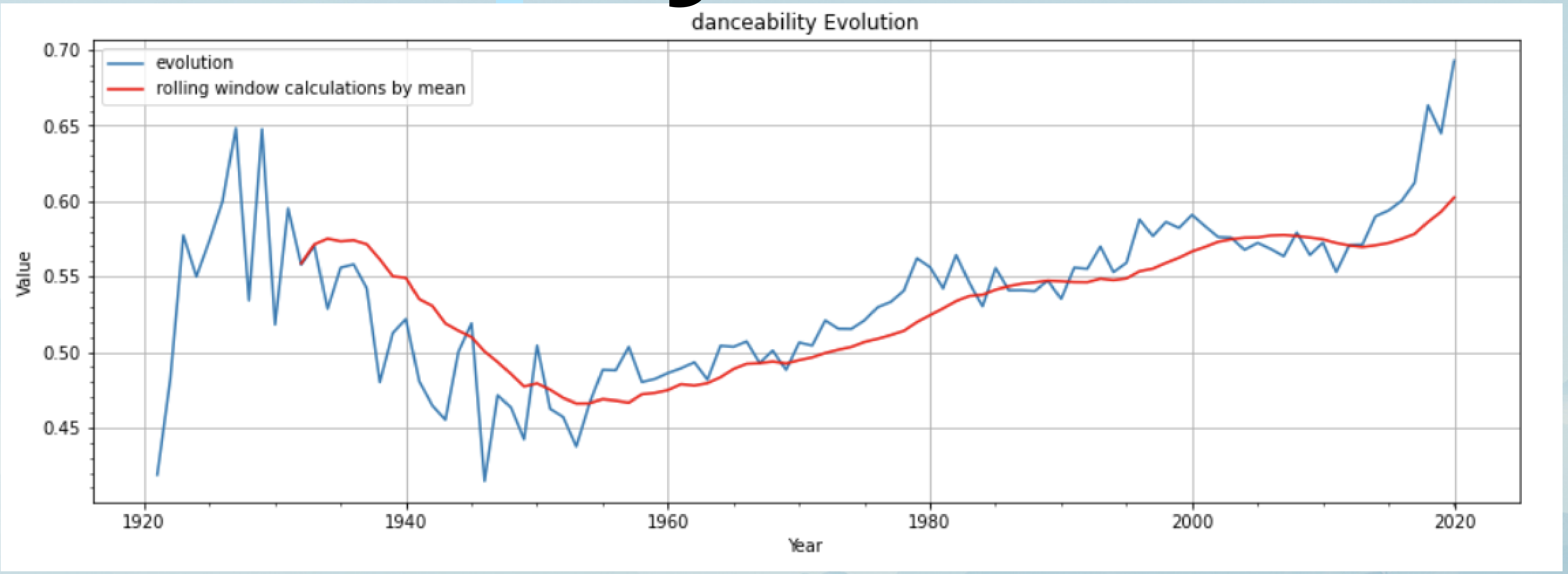
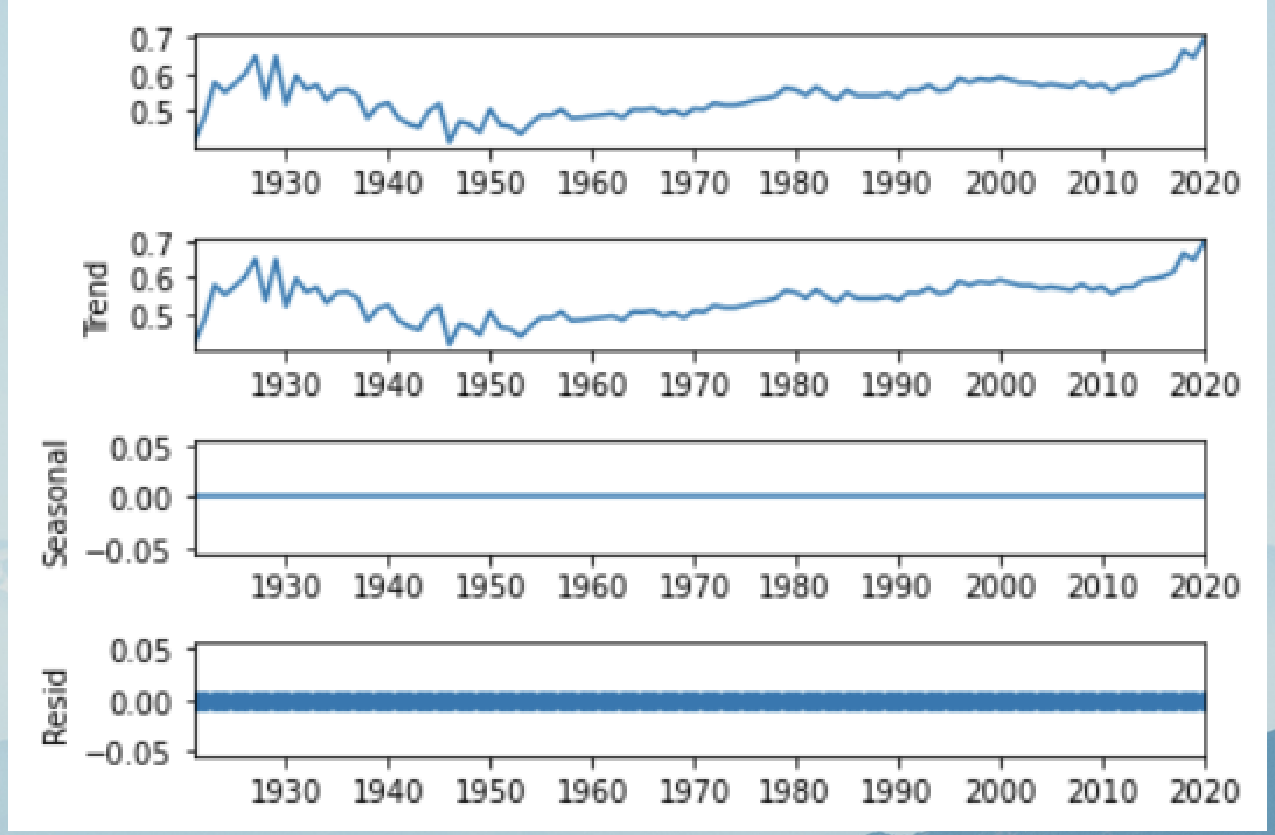
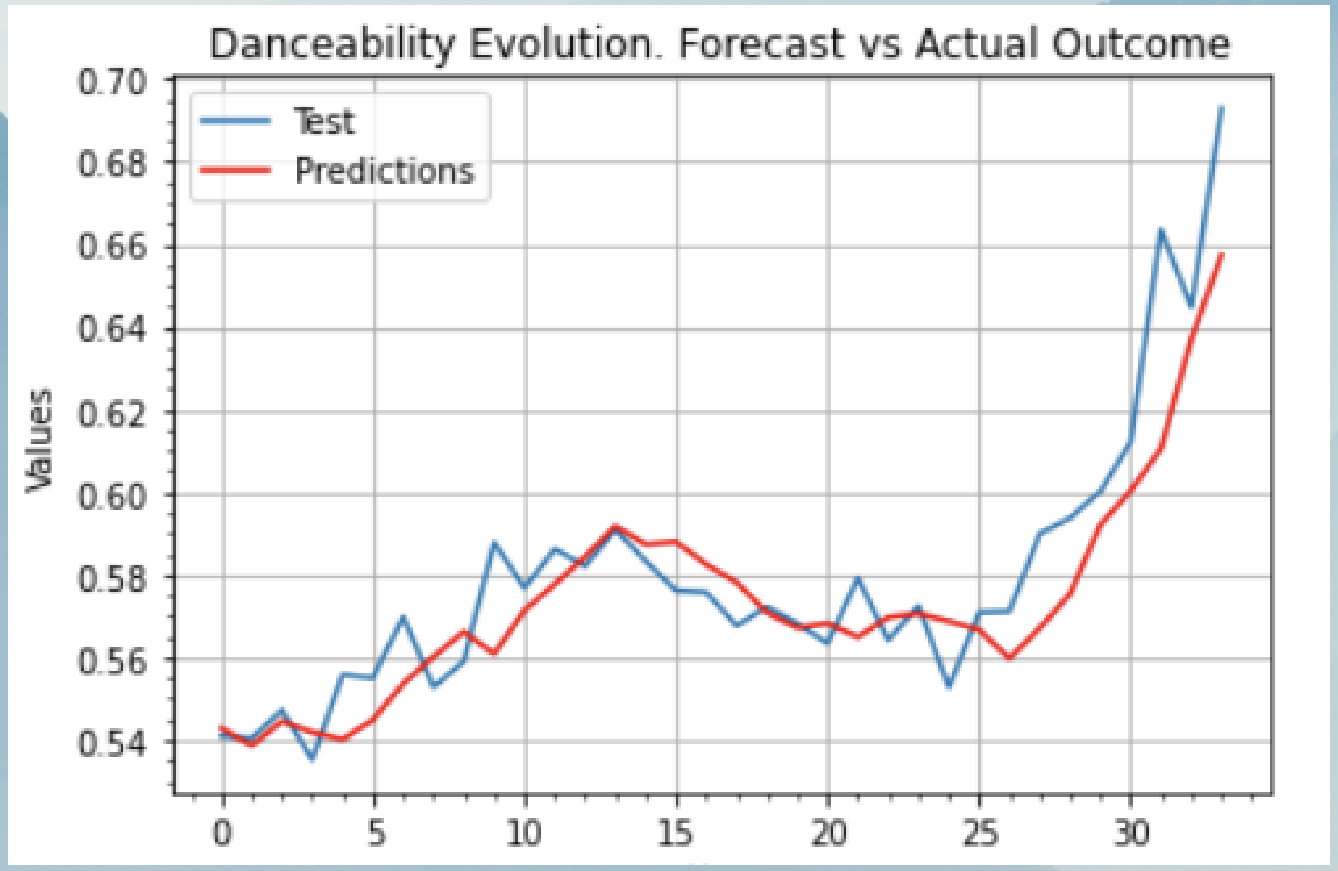
                               SARIMAX Results
==============================================================================
Dep. Variable:           acousticness   No. Observations:                  100
Model:                 ARIMA(5, 1, 0)   Log Likelihood                 135.618
Date:                Tue, 15 Dec 2020   AIC                           -259.236
Time:                        13:43:05   BIC                           -243.666
Sample:                    01-01-1921   HQIC                          -252.936
                         - 01-01-2020
Covariance Type:                  opg
==============================================================================
                 coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------
ar.L1         -0.6274      0.089     -7.054      0.000      -0.802      -0.453
ar.L2         -0.3310      0.123     -2.692      0.007      -0.572      -0.090
ar.L3          0.0928      0.113      0.818      0.413      -0.129       0.315
ar.L4          0.0457      0.117      0.392      0.695      -0.183       0.274
ar.L5          0.1918      0.056      3.423      0.001       0.082       0.302
sigma2         0.0038      0.000     13.028      0.000       0.003       0.004
===================================================================================
Ljung-Box (Q):                       34.21   Jarque-Bera (JB):               150.96
Prob(Q):                              0.73   Prob(JB):                         0.00
Heteroskedasticity (H):               0.04   Skew:                            -1.45
Prob(H) (two-sided):                  0.00   Kurtosis:                         8.31
===================================================================================
```

Danzability







Test RMSE: 0.015

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                               SARIMAX Results
==============================================================================
Dep. Variable:           danceability   No. Observations:                  100
Model:                 ARIMA(5, 1, 0)   Log Likelihood                 212.740
Date:                Tue, 15 Dec 2020   AIC                           -413.479
Time:                        11:14:24   BIC                           -397.908
Sample:                    01-01-1921   HQIC                          -407.179
                         - 01-01-2020
Covariance Type:                  opg
==============================================================================
                 coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------
ar.L1         -0.5835      0.083     -7.062      0.000      -0.745      -0.422
ar.L2         -0.0145      0.092     -0.158      0.875      -0.195       0.166
ar.L3          0.1980      0.128      1.546      0.122      -0.053       0.449
ar.L4          0.3634      0.089      4.085      0.000       0.189       0.538
ar.L5          0.1628      0.088      1.849      0.064      -0.010       0.335
sigma2         0.0008   6.27e-05     12.594      0.000       0.001       0.001
===================================================================================
Ljung-Box (Q):                       18.22   Jarque-Bera (JB):               103.68
Prob(Q):                              1.00   Prob(JB):                         0.00
Heteroskedasticity (H):               0.11   Skew:                             0.00
Prob(H) (two-sided):                  0.00   Kurtosis:                         8.01
===================================================================================
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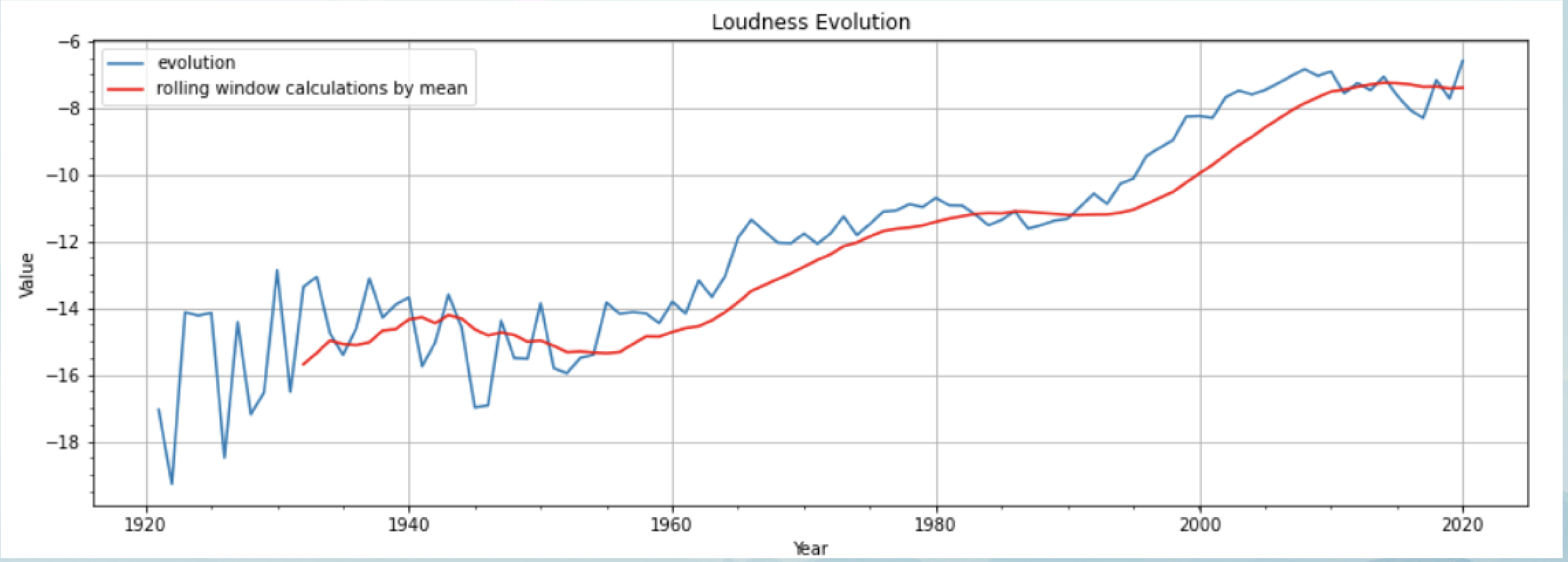
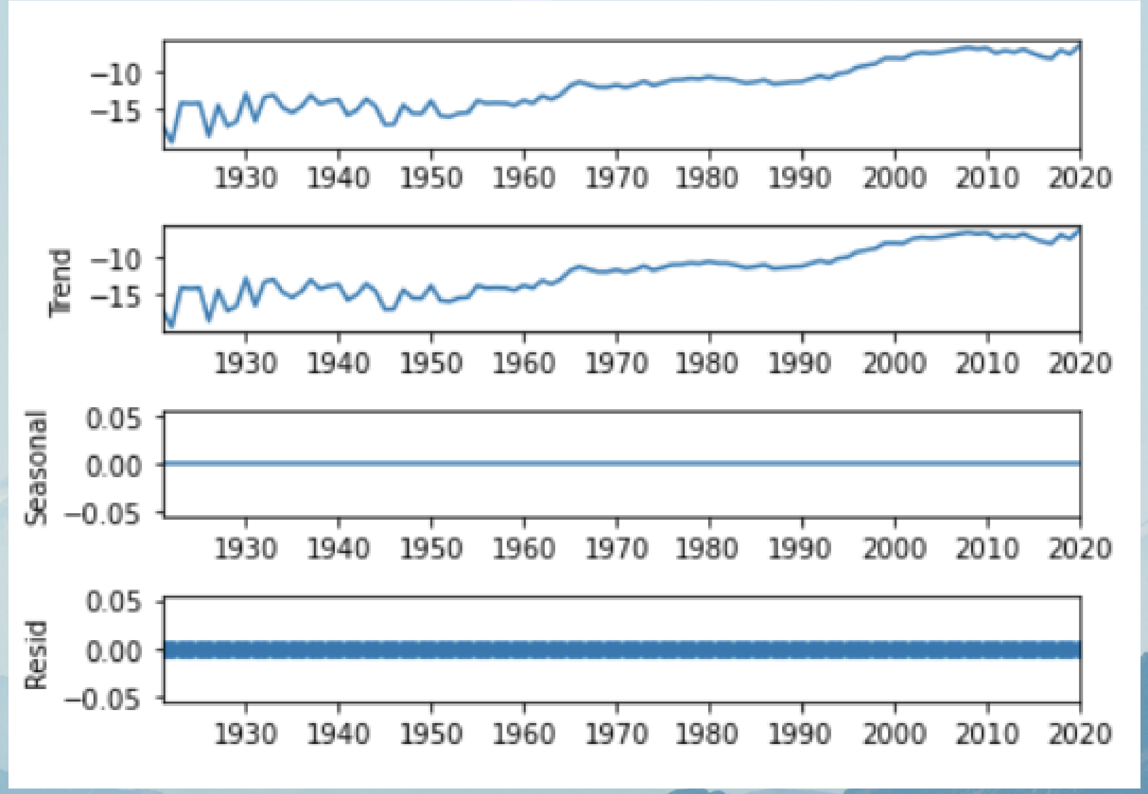
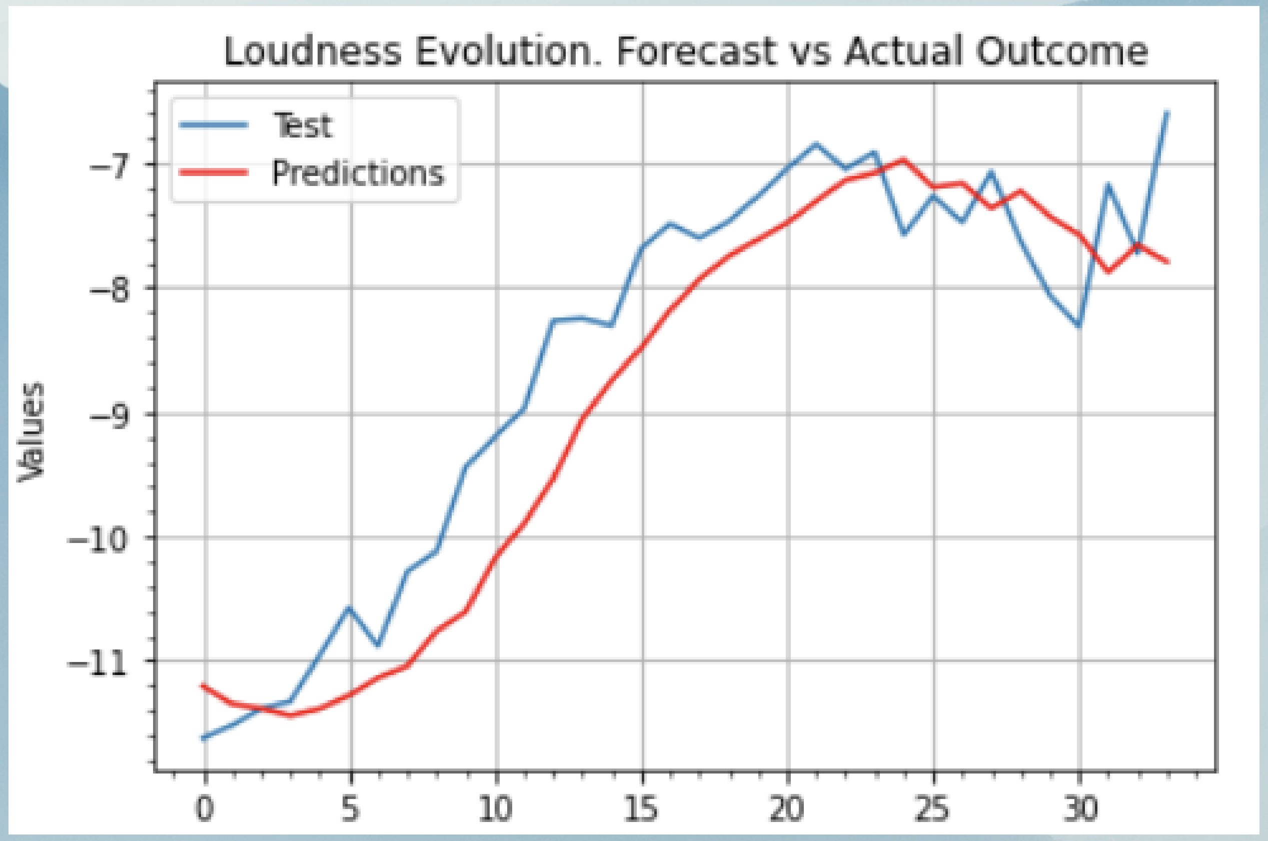
Loudness







Test RMSE: 0.619

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                               SARIMAX Results
==============================================================================
Dep. Variable:               loudness   No. Observations:                  100
Model:                 ARIMA(5, 1, 0)   Log Likelihood                -147.019
Date:                Wed, 16 Dec 2020   AIC                            306.038
Time:                        11:05:33   BIC                            321.609
Sample:                    01-01-1921   HQIC                           312.338
                         - 01-01-2020
Covariance Type:                  opg
==============================================================================
                 coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------
ar.L1         -0.6567      0.078     -8.440      0.000      -0.809      -0.504
ar.L2         -0.4654      0.095     -4.924      0.000      -0.651      -0.280
ar.L3         -0.2093      0.101     -2.073      0.038      -0.407      -0.011
ar.L4         -0.1268      0.104     -1.215      0.224      -0.331       0.078
ar.L5         -0.0412      0.079     -0.523      0.601      -0.196       0.113
sigma2         1.1349      0.132      8.602      0.000       0.876       1.393
===================================================================================
Ljung-Box (Q):                       32.91   Jarque-Bera (JB):                33.18
Prob(Q):                              0.78   Prob(JB):                         0.00
Heteroskedasticity (H):               0.13   Skew:                            -0.09
Prob(H) (two-sided):                  0.00   Kurtosis:                         5.83
===================================================================================
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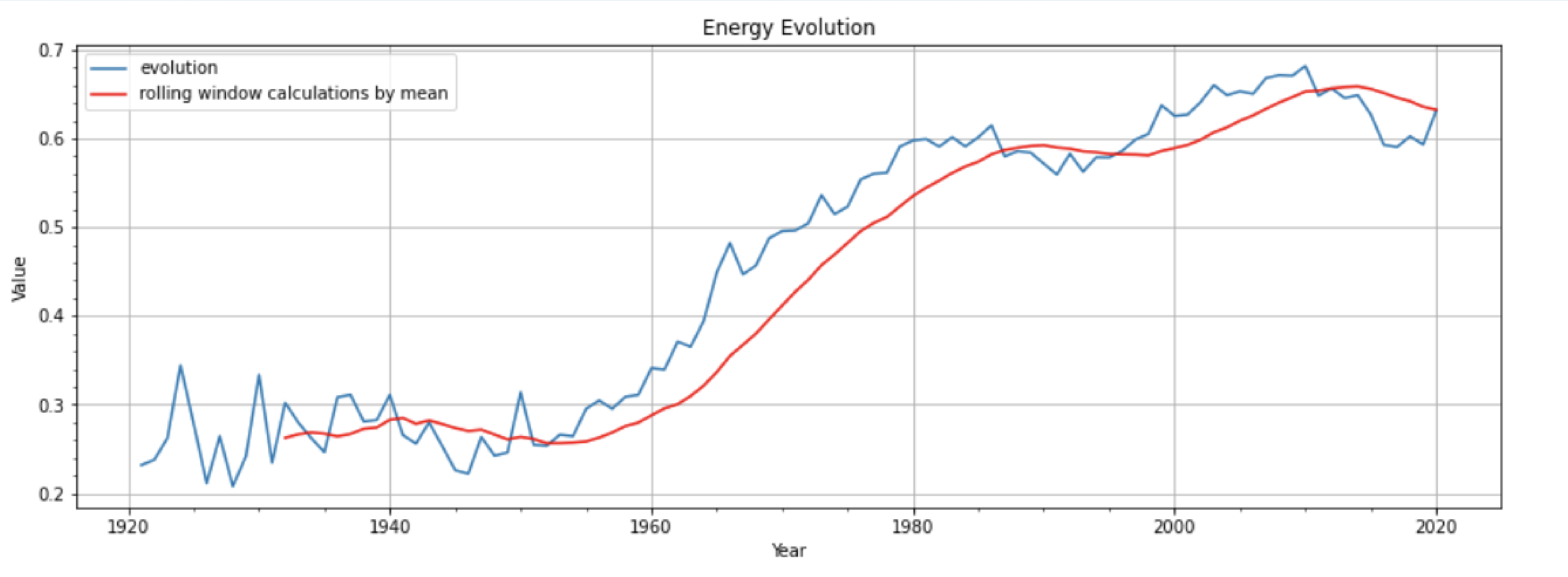
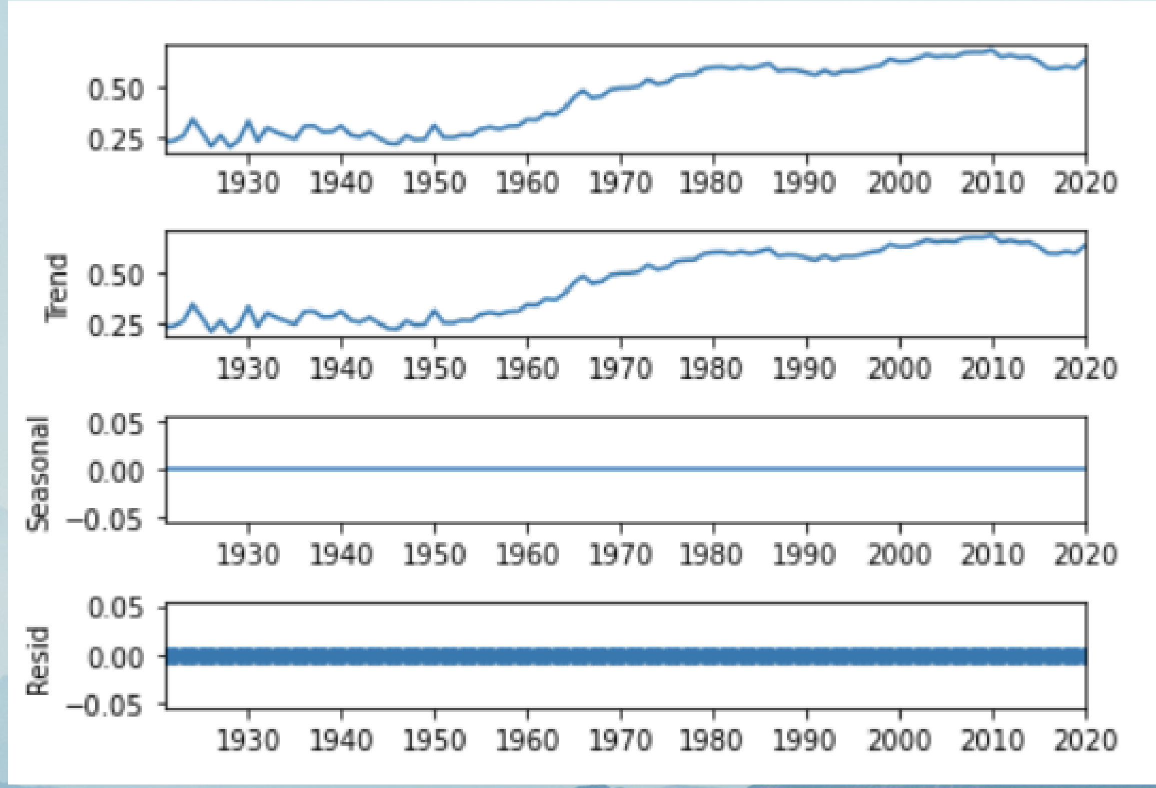
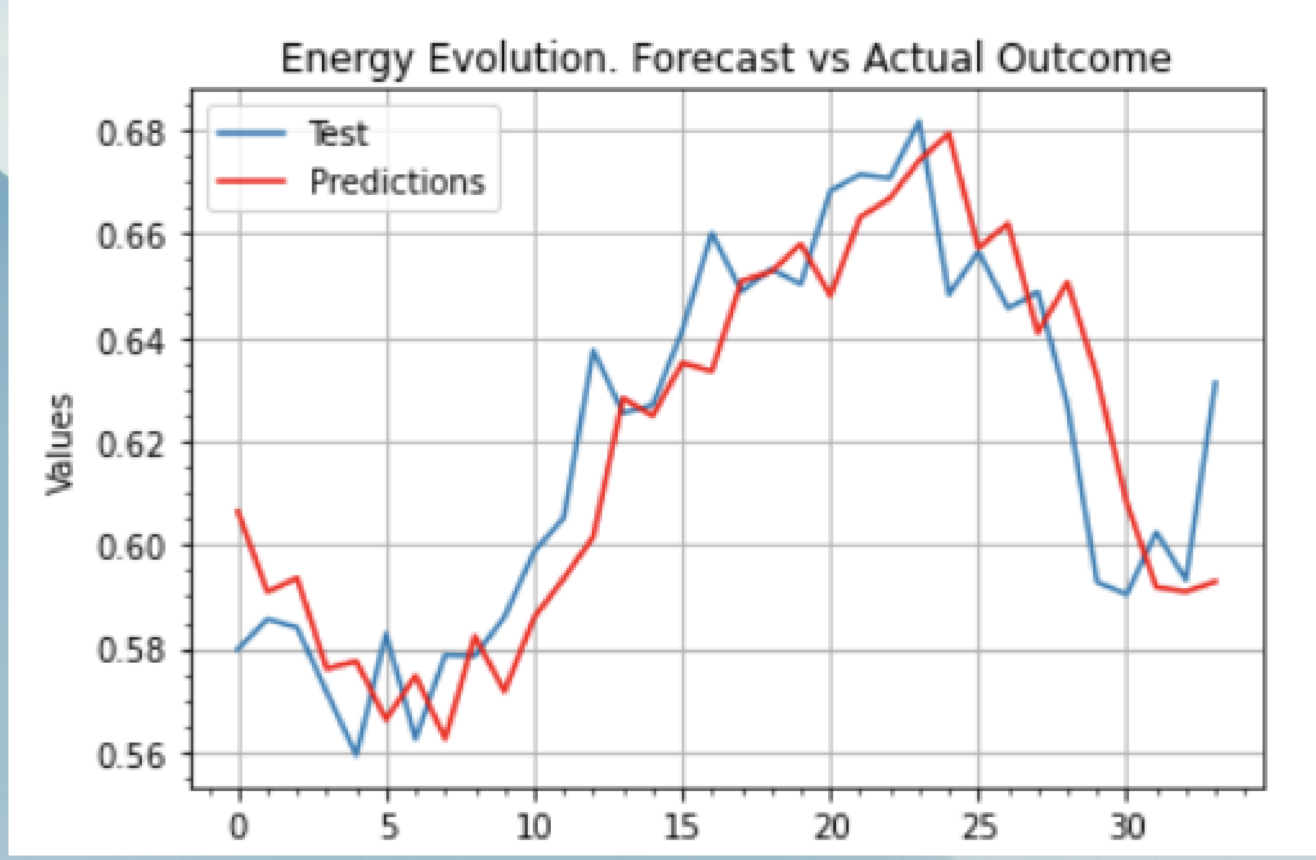
Energy







Test RMSE: 0.017

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                               SARIMAX Results
==============================================================================
Dep. Variable:                 energy   No. Observations:                  100
Model:                 ARIMA(5, 1, 0)   Log Likelihood                 214.953
Date:                Thu, 17 Dec 2020   AIC                           -417.905
Time:                        17:49:21   BIC                           -402.334
Sample:                    01-01-1921   HQIC                          -411.605
                         - 01-01-2020
Covariance Type:                  opg
==============================================================================
                 coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------
ar.L1         -0.3183      0.082     -3.867      0.000      -0.480      -0.157
ar.L2         -0.1576      0.085     -1.846      0.065      -0.325       0.010
ar.L3          0.2090      0.100      2.097      0.036       0.014       0.404
ar.L4         -0.0026      0.094     -0.028      0.978      -0.187       0.182
ar.L5         -0.0271      0.079     -0.345      0.730      -0.181       0.127
sigma2         0.0008   9.97e-05      7.604      0.000       0.001       0.001
===================================================================================
Ljung-Box (Q):                       31.61   Jarque-Bera (JB):                 5.80
Prob(Q):                              0.83   Prob(JB):                         0.06
Heteroskedasticity (H):               0.19   Skew:                             0.21
Prob(H) (two-sided):                  0.00   Kurtosis:                         4.11
===================================================================================
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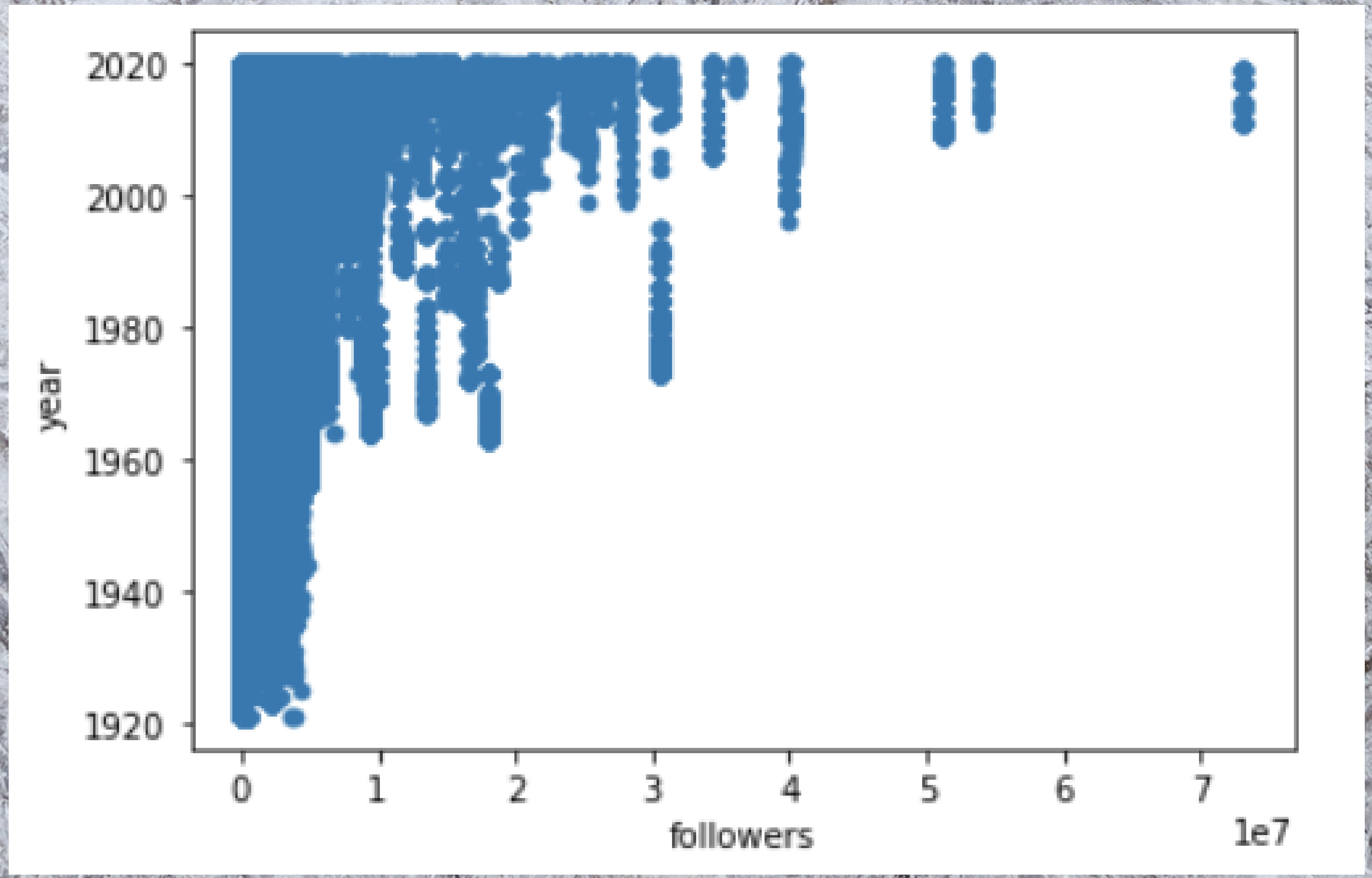
Predicción de número de followers mediante Maching Learning

Random Forest Regression

RMSE=4.417.028,35336

Regresión Lineal

RMSE=21.523.002,45




Thank you!
cold, smooth & tasty.