Graphical user interface

Description automatically generated

Match the time series plots to their ACF: **1-B, 2-A, 3-D, 4-C**

**Graphical user interface, chart

Description automatically generated**

**ANSWER:** A. ETS(M,N,M) B. ETS(A,A,N) C. ETS(M,M,N) D. ETS(M,Ad,M)

**ETS(X,Y,Z), X – Error, Y – Trend, Z – Seasonal**

Trend = {N,A,Ad}

Seasonal = {N,A,M}

Error = {A,M}

**TBATS models for electricity demand**

As you saw in the video, a **TBATS model** is a special kind of time series model. It can be very slow to estimate, especially with multiple seasonal time series, so in this exercise you will try it on a simpler series to save time. Let's break down elements of a TBATS model in TBATS(1, {0,0}, -, {<51.18,14>}), one of the graph titles from the video:

| **Component** | **Meaning** |
| --- | --- |
| 1 | Box-Cox transformation parameter |
| {0,0} | ARMA error |
| - | Damping parameter |
| {\<51.18,14>} | Seasonal period, Fourier terms |

The gas data contains Australian monthly gas production. A plot of the data shows the variance has changed a lot over time, so it needs a transformation. The seasonality has also changed shape over time, and there is a strong trend. This makes it an ideal series to test the tbats() function which is designed to handle these features.

gas is available to use in your workspace.