

= White Noise =

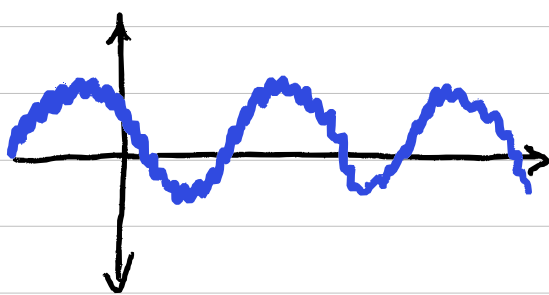
White noise is a very important concept in time series because it is highly related with the answer of the question:

When should I stop fitting my model?

- A time series is classified as white noise if:

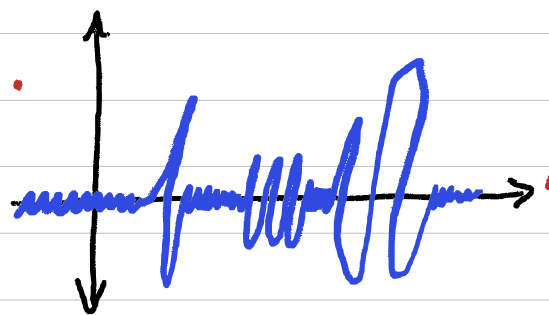
- Mean = 0
- Std. dev = cte.
- Correlation between lags is 0

1.



$\mu = 0$ ✓
 $\sigma = \text{cte.}$ ✓
✗ Correlation between lags is violated because if the value in a certain moment is high, it is likely to be high in the next time period.

2.



✗ $\sigma \neq \text{cte.}$ with time

White noise is a great measure that gives us the chance to know if we could do it better or not in order to capture the dynamics better. If it is truly white noise we cannot have done any better.

Because one of the biggest properties of white noise is that it is **NOT PREDICTABLE**.

Why is it important?

$$Y_t = \text{Signal} + \text{Noise}$$

→ The point is that if we can prove that our residuals are white noise or really close to it, then we can say that the model fits really good the data.

Test for White Noise

- 1. Visual test
- 2. Global vs Local test
- 3. Check ACF