





Series Temporalis

by Tanya Kleingeld

The sun was rising, and the null and alternative hypothesis guards filled the castle grounds. Their mission was to keep everything statistically sound, and they rejected anything that threatened their perfect kingdom.

57

The day had finally arrived. Models from around the Time-Series world gathered to celebrate $ARIMA(1,0,1)$'s coronation ceremony. She would become queen over Series Temporalis, the colossal capital city of the Time-Series world. $ARIMA(1,0,1)$ had a younger sister. Her name was Non-Stationary $ARMA(1,1)$, but people called her NS for short. By the kingdom's standard, she was not the most beautiful model since she was not stationary.

She always felt worthless, like she should not be time-series royalty. She always loved her sister, but she became exceedingly jealous over the years and finally decided that she would have her revenge and become the nasty process that everyone thought she was. So, she started devising her plan. She would destroy every single stationary process, including her sister.

ARIMA(1,0,1), blissfully unaware of what her sister was planning, was getting ready with MA(1) — one of her closest friends — in one of the rooms on the castle’s east side. ARIMA(1,0,1) was worried about her sister.

“I don’t know why she is acting the way she does”, ARIMA(1,0,1) said to MA(1) with tears in the corner of her eye.

MA(1) sighed and said, “Maybe she just doesn’t like change. And this is quite a big one. You are going to become queen over Series Temporalis. Don’t worry. Your sister will be fine”.

ARIMA(1,0,1) felt sad and did not know what to make of everything, but she kept smiling, hoping that her sister would one day accept everything.

58 NS did not stop her planning. She was busy gathering all the non-stationary processes that she could find. She tried to convince some of the guards to take her side, but they cared too much about the statistical well-being of the castle. She even went to the ACF, but he was too close to all the MA processes. He didn’t even want to listen to NS. NS was desperate, she needed to find more people who did not like the stationary processes. She just didn’t know where to go anymore. She went outside to sit on one of the benches in the yard near the Ljung-Box tree. She never really liked the tree, but she could not sit anywhere else, and then, unexpectedly, the Random Walk process came to her. She had nothing against him as a process, but she always found his way of walking strange and aimless. At least he understood and respected her as a process. If anyone could understand her, it was him. He finally stood still and started talking to NS.

“Hi NS, I hear you are starting a mission. I know it’s difficult to find processes to stand up against those stationary ones, but I have a plan. There’s a small town just a few time intervals away. The town is full of processes that aren’t happy with themselves. Maybe you should go there and see if you can find anyone else to join your cause.”

NS started to smile, things were finally looking up, and her plan to destroy every single stationary process was starting to fall into place.

But she was curious to discover how Random Walk discovered this place, so she asked him.

He smiled and replied, “Well, I don’t really have a choice, going up and down like a drunkard all the time”. He then stood up and walked in that funny manner again.

NS was excited; everything was falling into place.

She arrived in the town that was filled with all sorts of processes. The processes in the town looked very sad and mad. She saw an upward trend time-series process walking toward her. NS stopped her and started telling her about her plan. She could see that this upward trend was ready for anything. All the processes assembled themselves and started marching towards the castle. Everyone stopped before the gate, shouting for $ARIMA(1,0,1)$ to come out. $ARIMA(1,0,1)$ saw her sister and ran outside as fast as possible. But NS was surprised when she saw a small non-stationary $AR(2)$ process walking with $ARIMA(1,0,1)$.

$AR(2)$ could see how confused NS was, so he decided to explain himself, “NS, I know you’re angry, but you really have no reason to be. We’re all processes. I was made the way I am for a reason. You can’t just discard yourself and tell yourself that you are less important because you don’t meet the kingdom’s time-series beauty standards. We’re all part of this amazing city called Series Temporal!”.

59

$AR(2)$ then glanced at the other processes and continued, “Stop thinking that no one wants you or that you aren’t good enough because you are. Upward trend, you are a time-series process that someone wants to see when it comes to their sales over time. You can make someone’s day by just being you. Don’t stop being yourself for someone who can’t see your worth.”

She cried, realising that together they formed the Time-Series world, and there was peace in the kingdom once again. All thanks to the $AR(2)$ process, who stood up and realised he was more than enough.