





## Curing Non-stationarity in the TSA

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**A**  $ARMA(20,21)$  stood on the top of the mountain, looking over the big country of the TSA. In front of him was the AR Capitol with its massive buildings. Behind him, on the other side of the mountain, was the glamorous MA Capitol. There were big walls around both capitols. You could only enter the MA Capitol if you could pass the ACF scanner; it only allowed pure MA citizens through. The same was true for the AR Capitol. You could only enter once you had passed the PACF scanner. The PACF scanner only cleared pure AR citizens.

Between the Capitols, around the mountain,  $ARMA(20,21)$  could see the rest of TSA. This was the place where the common ARMA people lived, like himself. They were farmers, miners, builders, and everything in between. They were not privileged enough to get into either capitol. These common ARMA people had to work hard to ensure the two capitols could live in luxury.

Right next to ARMA(20,21) was the peacekeeper's home. His name was White Noise. His purpose was to ensure a balance within this country of the TSA. Every month he met up with AR(1) and MA(1), the two presidents of the capitols. They talked about the good and the bad happening in the TSA, but the AR citizens just could not forget the past. They were mad about past wars, which meant that they couldn't reach an agreement that would unite all citizens of the TSA.

ARMA(20,21) walked down the mountain with a smile on his face after watching the beautiful sunset.

The next morning when ARMA(20,21) woke up, ready to go to work, he could sense something was not quite right. He looked out the window and saw several people being rushed to the hospital. His thoughts immediately jumped to ARMA(21,20). Was she okay? He was madly in love with her. They were a perfect fit for each other.

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ARMA(20,21) rushed to his beloved's house only to find it empty. His heart sank. In desperation, he went to the nearest hospital to find her. He found her in a large room filled with sick people. There weren't enough doctors to help all the sick. There were different types of ARMA people of all  $p$ - and  $q$ -values. ARMA(20,21) spotted a doctor running by and grabbed his arm. The doctor could provide no useful information besides telling him that this big plague was called Non-stationarity-19. This affected the phi-chromosome, which caused the sickness.

The citizens of the AR Capitol became infected, even within their high walls. One thing stood out for ARMA(20,21) as he dug deeper into the cause of Non-stationarity-19. Not a single person in the MA Capitol became infected. They must have had some vaccine. ARMA(20,21) pledged to find the cure to save his dear ARMA(21,20).

The first place that ARMA(20,21) was going to search was the MA Capitol. When he arrived there, everything seemed eerily quiet. There were no guards, and all gates were sealed off. It was almost like they were locked down. He decided to investigate. Around the corner of the gates, he spotted a ladder going over the wall. Somebody must have broken in.



The only option was to climb the ladder to get over the wall. When ARMA(20,21) reached the top and peeped over, he saw all the MA citizens gathered silently. In front of them stood a familiar-looking person holding a gun to MA(1)'s head. ARMA(20,21) could not determine why this person looked so familiar. Their president was in danger!

This armed person shouted, "Nobody move, or I'll shoot!"

ARMA(20,21) decided that he needed more help, and climbed back down the ladder. After a long day of travelling, ARMA(20,21) reached the top of the mountain in the dark. White Noise gladly welcomed him into his home, having spotted ARMA(20,21) outside his home several times, watching the sunset. After discussing the situation in the MA Capitol, the two of them decided to get help from the AR Capitol. White Noise had a helicopter at his disposal. They travelled quickly to meet up with AR(1). Although AR(1) was not fond of helping the MA Capitol, he agreed. They gathered some guards and headed straight to the other side of the mountain.

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The plan was to strike at dawn. The rescue party strategically entered through the back of the MA Capitol to ambush the intruder. ARMA(20,21), AR(1), and White Noise approached the intruder, still holding MA(1) hostage. Just as they stepped in front of the intruder, White Noise recognised him. It was his evil twin brother, Random Walk. He had escaped from the dungeons deep within the mountain.

White Noise said, "It's over, brother. We have you surrounded".

Random Walk had no choice but to give up. The MA Capitol was safe.

MA(1) told ARMA(20,21) that it was Random Walk that poisoned the drinking water with Non-stationarity-19. He didn't want the MA people to go and help the rest. The MA scientists did indeed have a vaccine, which they already gave to all the MA citizens at birth. MA(1) reassured ARMA(20,21) that ARMA(21,20) was going to be okay.

They got the vaccine to the rest of the TSA as quickly as possible. Everyone was back to full health within a few days. ARMA(20,21) was ecstatic that his beloved was cured. He had fulfilled his promise. ARMA(20,21) and ARMA(21,20) lived happily ever after.

At the next monthly meeting, White Noise, AR(1), and MA(1) decided to upgrade the locks in the dungeon and double the number of guards. Very importantly, AR(1) and MA(1) decided to restrict access to the capitols no longer.

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To celebrate their differences. The whole TSA had a day off and held huge parties. Everywhere in the streets, you could hear the AR, MA, and ARMA people singing together repeatedly, "Born in the TSA".

Everything was good. They were safe from Non-stationarity, for now...



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