





# Downtown Braamfontein

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**I**n a busy, colourful, and vibrant central Johannesburg in Braamfontein lived a PhD student who knew all about desire and feeling desired, the freedom of letting your mind run wild with ideas. This story is of destruction, of wanting to have the best of both worlds, all at the same time.

85

The people we meet daily are in no way without a past - be it friends, family, or our significant others - we all have baggage from our lagged previous lives, which shows up in our present, and even our future selves.

When AR(1) met MA(1), he had no idea that his life would change significantly. You see, MA(1) and AR(1) were polar opposites in every sense of the word. AR(1) was more of a linear guy. Some people would even call him straightforward or uptight. He wanted things to be as clear as possible. He was the type of guy who regressed himself, meaning he predicted what happened in his present and future life using past experiences. It's a bad habit he had because he was just so obsessed with control. MA(1), on the other hand, was the type of girl who would always provide you with stationarity (stability). You didn't have to look for it, but she wasn't perfect either - she lived with her own

errors that she had made in the past and was not as straightforward as AR(1). One might even say she was the kind of girl who loved a good experience occasionally. Amid the love-hate relationship, the two were blessed with ARMA(1,1), who possessed the qualities of both AR(1) and MA(1). It seemed, for a little while, like there would be some hope for our two lovers because ARMA(1,1) had stationed (stabilised) the two, much like his mother, MA(1), did. Could this have been the happiest ever after we're all looking for?

Nothing in life is what it seems, and we can never assume normality as we do. As this relationship progressed over the years, we learn that one of these two had compromised some of their values and principles. We find out that there have been some differencing operations (non-stationarity and cheating) in the relationship.

Now, things became dicey as we discover that MA(1) had stepped out of the relationship, thus resulting in ARIMA(1,1,1). Two people were originally in the relationship, and one more was introduced on the side ( $d = 1$ ). The autocorrelation (bond) between AR(1) and MA(1) through ARMA(1,1) had gradually died out; it exhibited an exponential decay towards zero. The bond, the love, and the connection were no longer there. Can we blame them, or was something sinister lurking in the background that pushed MA(1) to do what she did?

86

Questions start to race in our minds: Did the relationship between AR(1) and MA(1) return to where it was? Was there a way to pinpoint where things went sour for MA(1) to commit such an atrocious sin? How sure are we that it was just with one person? Who exactly were those people? Was it ARI(2), ARI(3), IMA(2), or IMA(3) maybe?

As the saying goes: "When two bulls fight, the grass suffers." Differences needed to be put aside to remedy the situation and prioritise the well-being of ARMA(1,1) - to provide the stationarity (stability) that was so needed.

MA(1) was such a tricky character, right? So, let's break down why she did what she did. In a world full of judgement and hatred, how was she supposed to show her true self when all she ever wanted was to truly be with the girl who set her heart on fire? Her affair with IMA(1)

was not a coincidence, but merely a desire to want the best of the two worlds. A world in which AR(1) provided security in some form or the other and one in which IMA(1) provided the thrill, the experience of non-stationarity (no stability), where every event was just based on some random feeling that rose at that given point in time, be it in the past (lagged), present or future.

A solution, an answer, was needed to solve this. But what? How do we remove IMA(1) from the equation? How do we remove  $d = 1$  from the ARIMA(1,1)? How do we un-integrate ARIMA(1,1)?

The best solution was first-differencing ARIMA(1,1,1) through mediation, therapy, and counselling, as this would enable AR(1) to come to terms with the issue. We can only hope that the relationship between AR(1) and MA(1) ended in reconciliation and had some stationary (stable) consistency with no seasonality (no extramarital activities).

