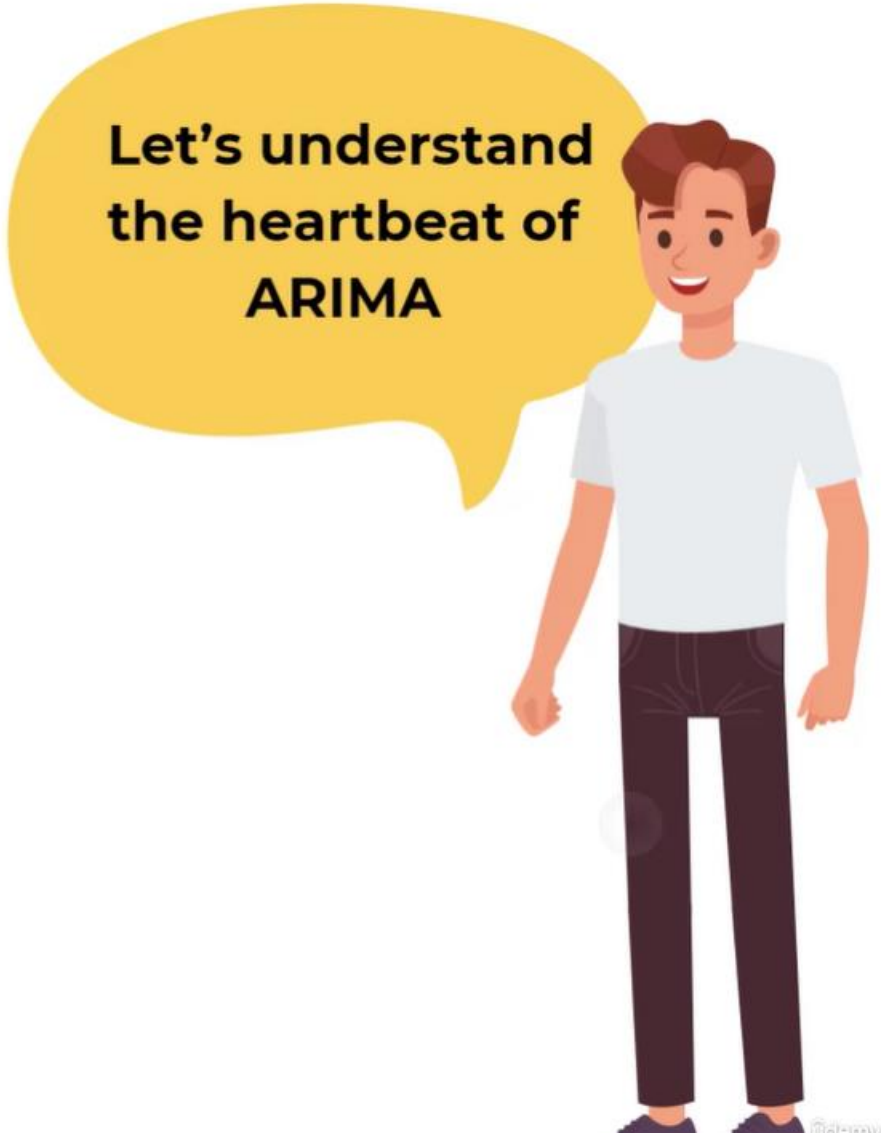
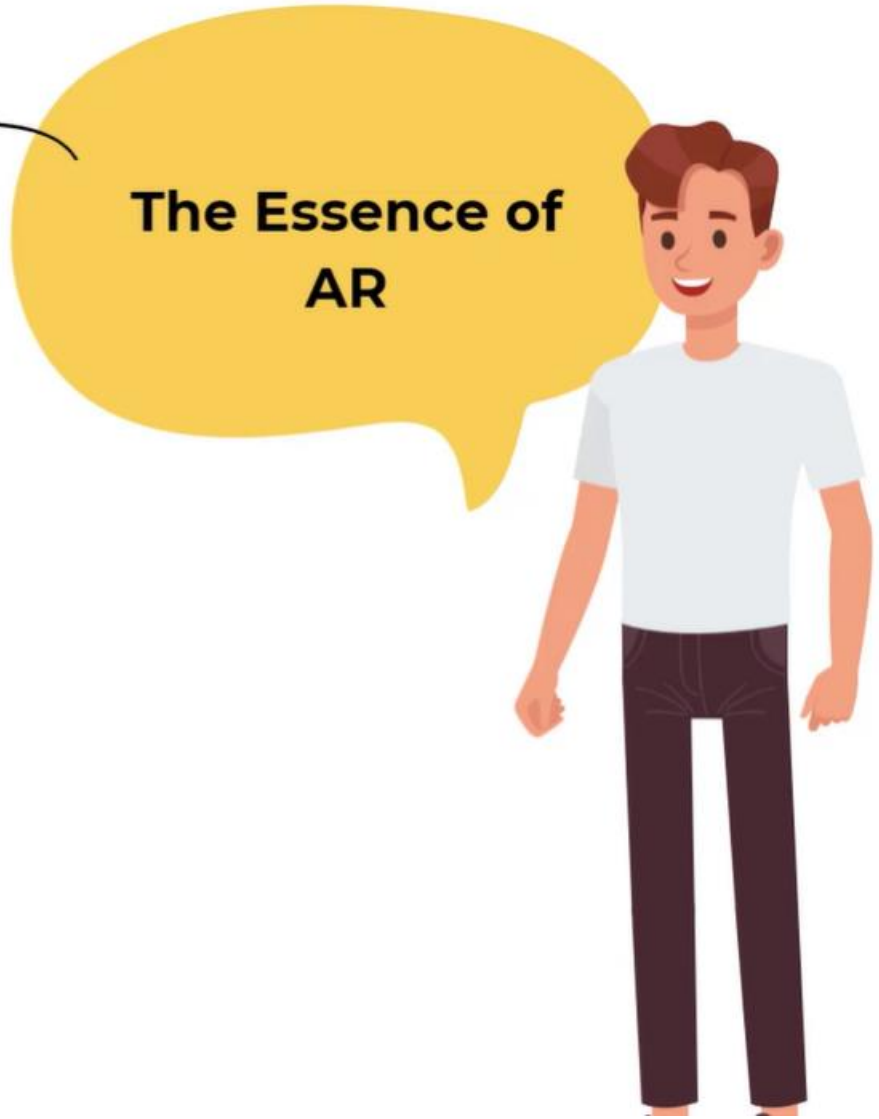
Cognate/Professional Electives

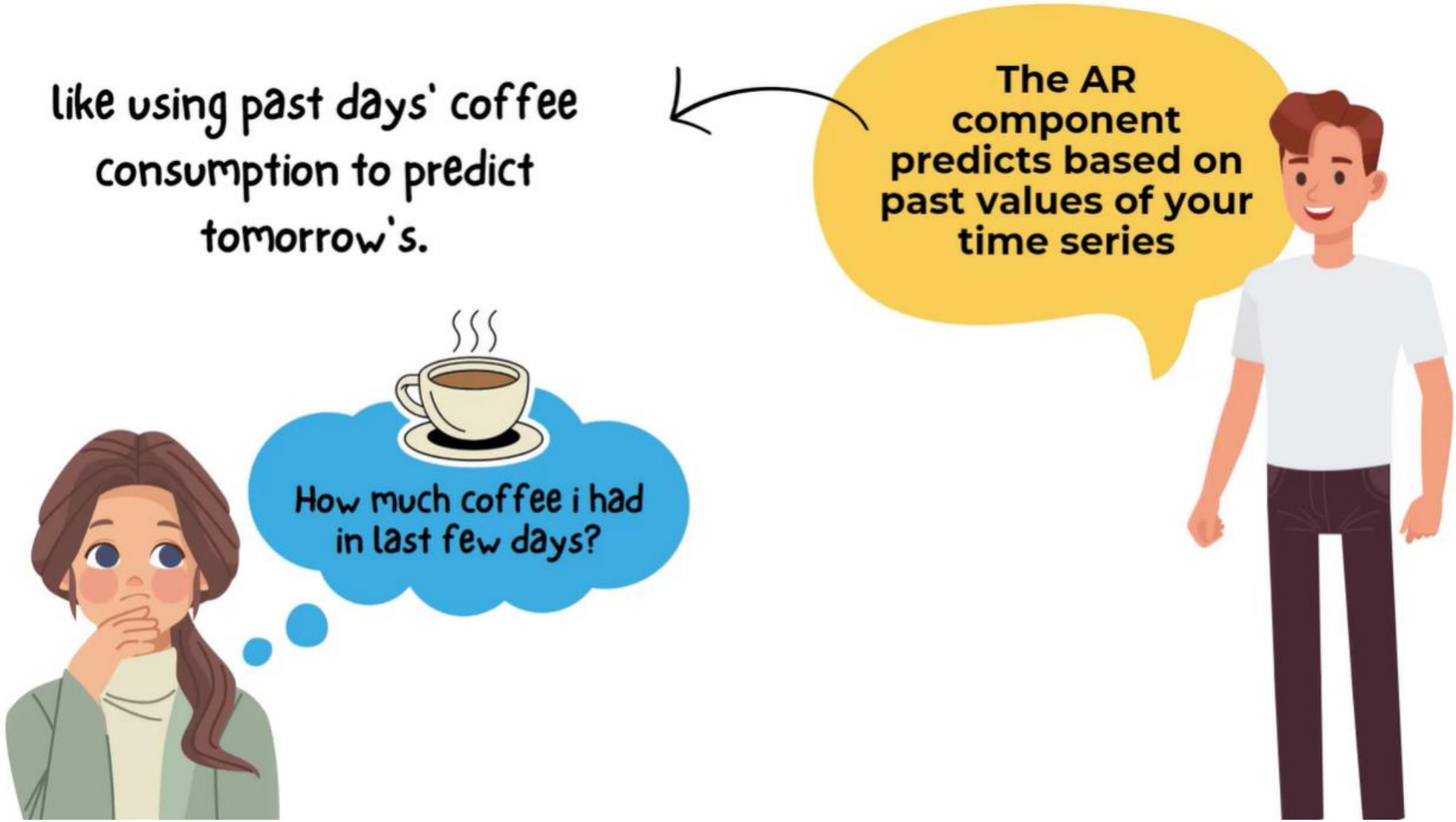


Cognate/Professional Electives

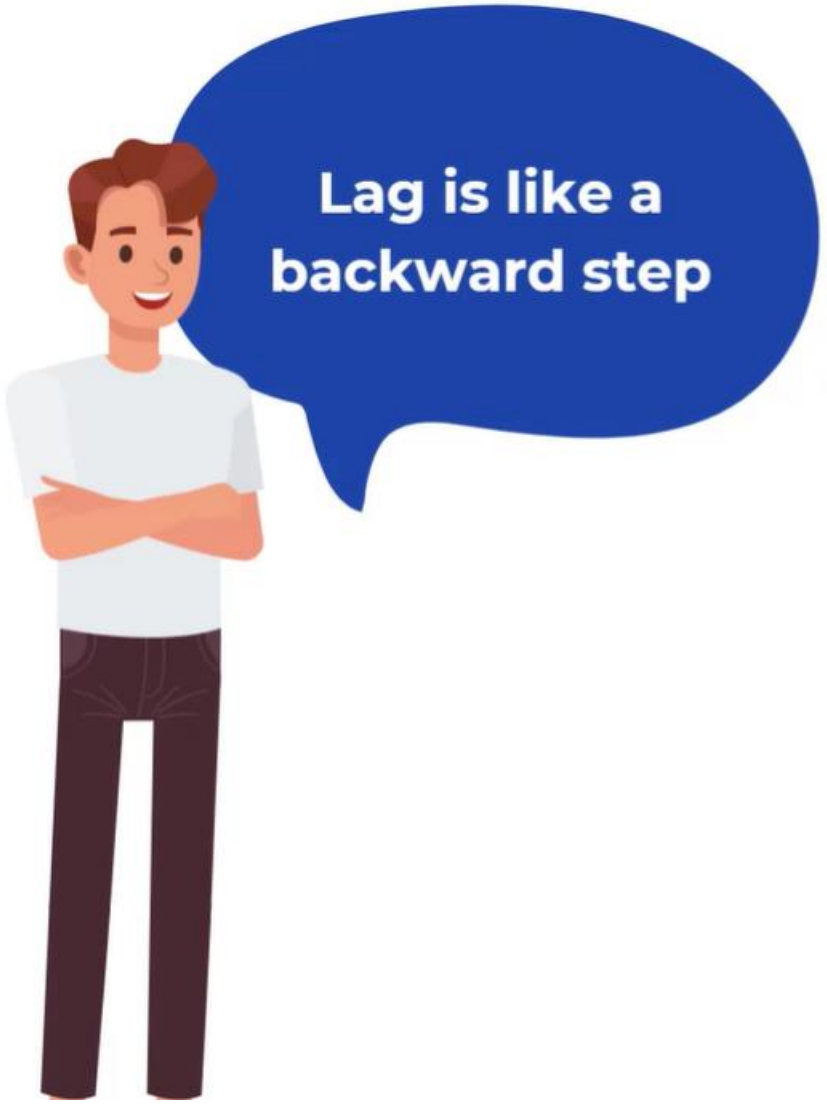
Past Influences the Present



Cognate/Professional Electives

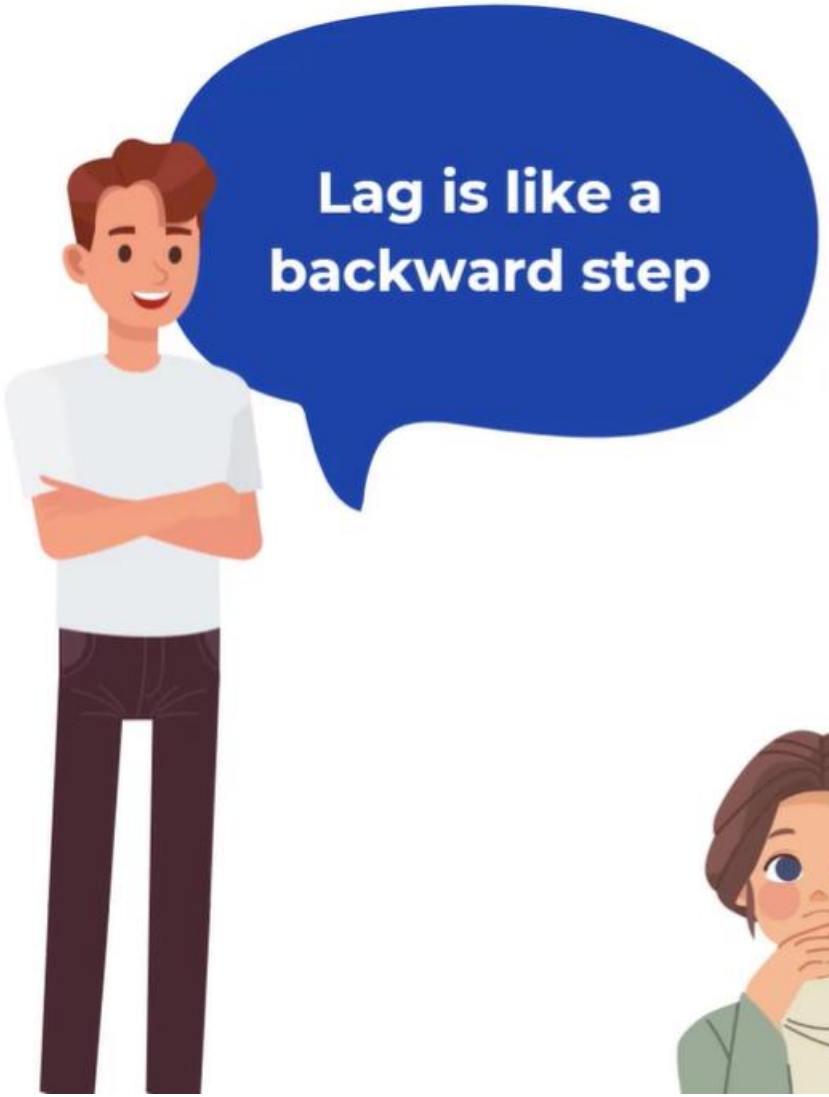


Cognate/Professional Electives

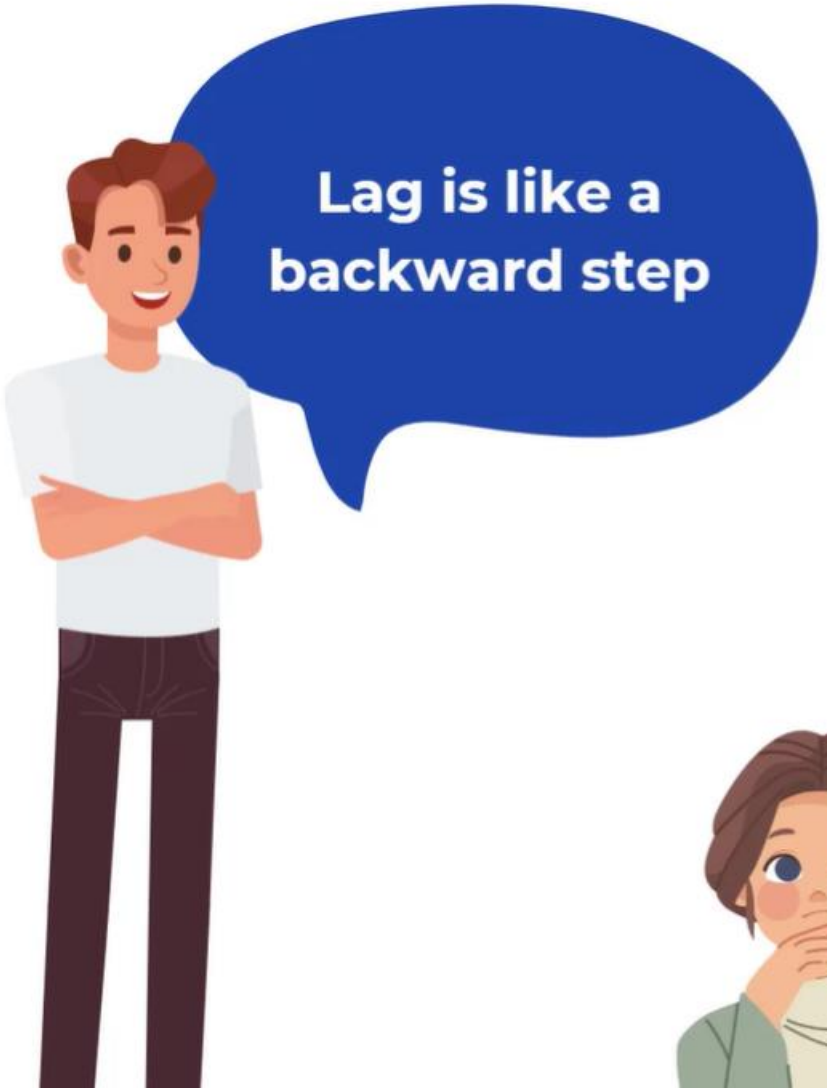


It's All About Lags
(Previous data points)

Cognate/Professional Electives

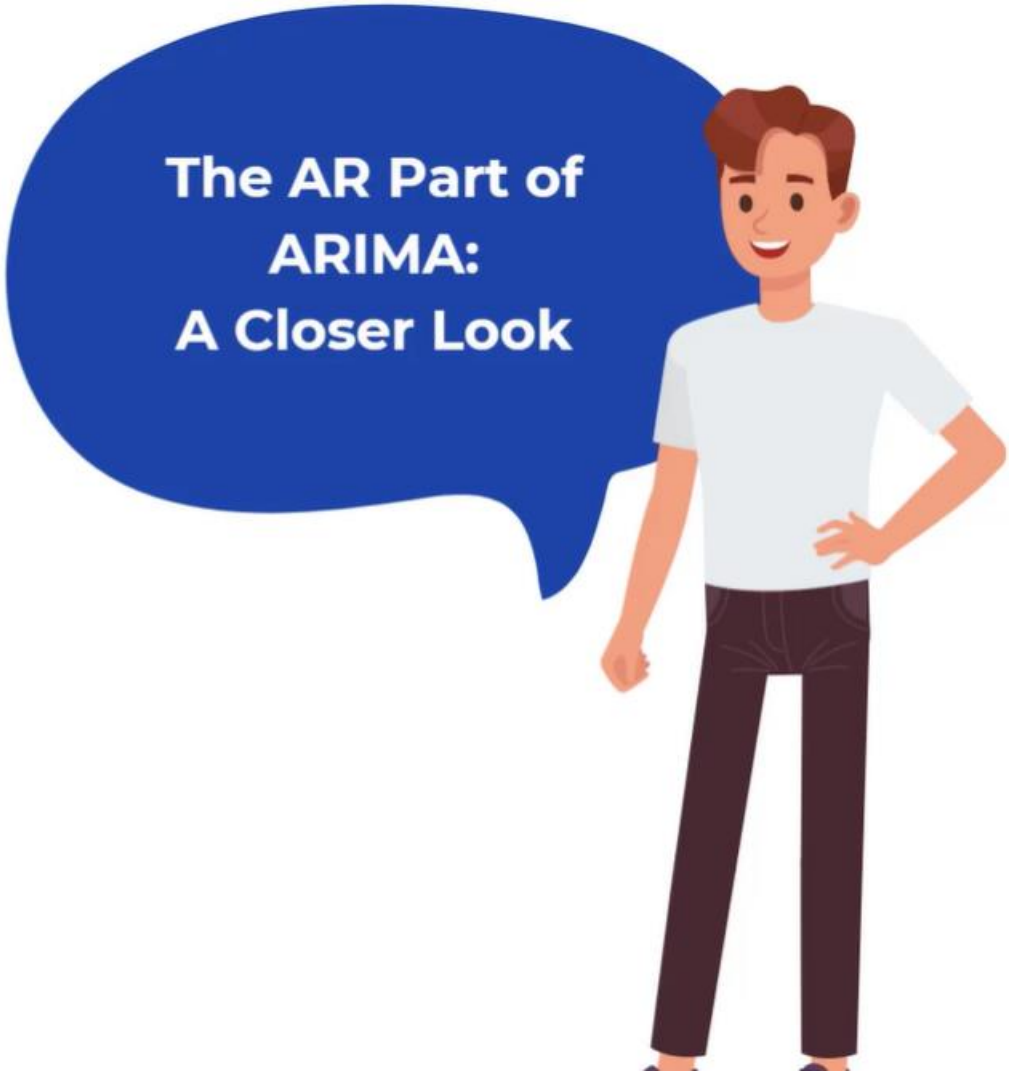


Cognate/Professional Electives



Lag 2 means day before yesterday's coffee!

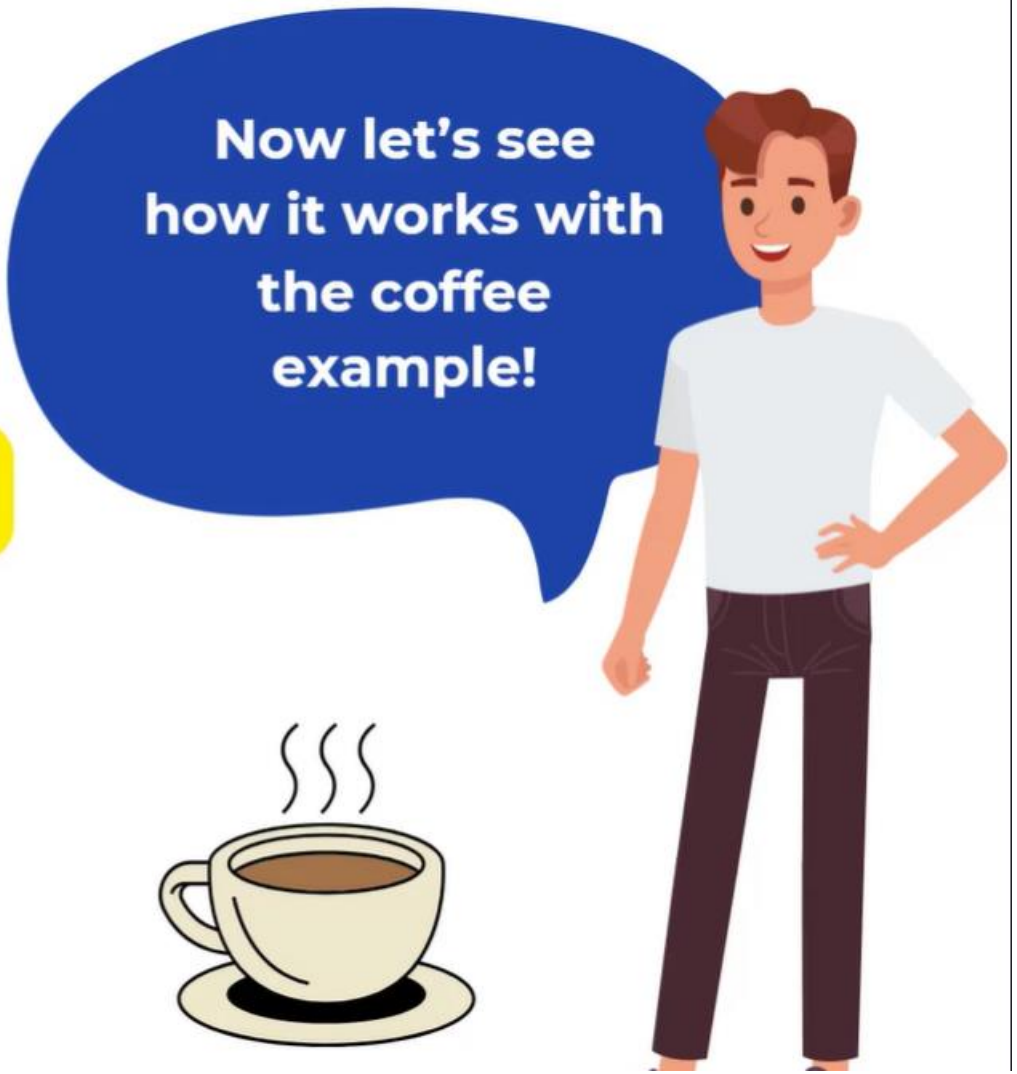
A R I M A
p
number of lagged values


The AR Part of ARIMA: A Closer Look

EXAMPLE

ARIMA(2, d, q)

today's Coffee= α+ ϕ1 * Yesterday's Coffee + ϕ2 * Day Before Yesterday's Coffee+...



EXAMPLE

ARIMA(2, d, q)

Today's Coffee= α+ ϕ1 * Yesterday's Coffee + ϕ2 * Day Before Yesterday's Coffee+...

α = constant

ϕ1, ϕ2,... = coefficients

Cognate/Professional Electives

- AR captures past's impact on now.

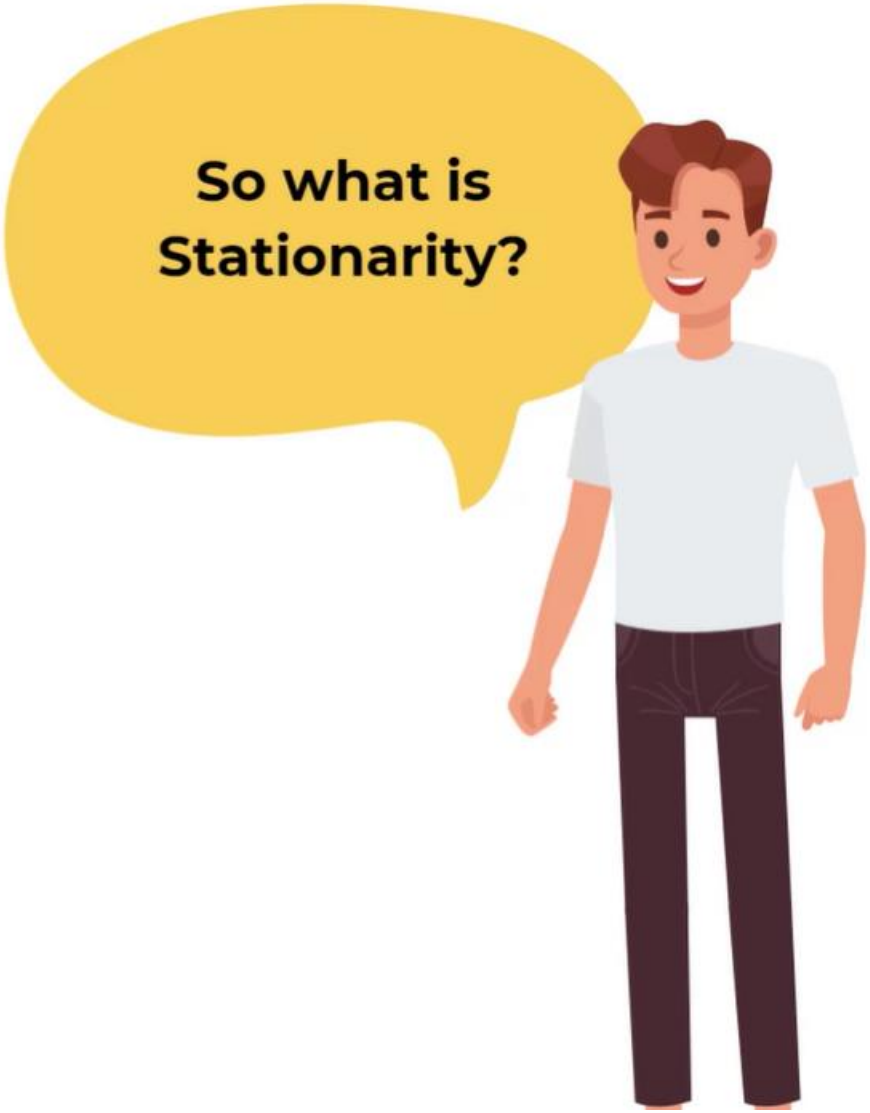
Cognate/Professional Electives

- AR captures past's impact on now.
- AR is super powerful in such time series where patterns and trends are important.

Cognate/Professional Electives

It's basically using past to predict the future.

Cognate/Professional Electives

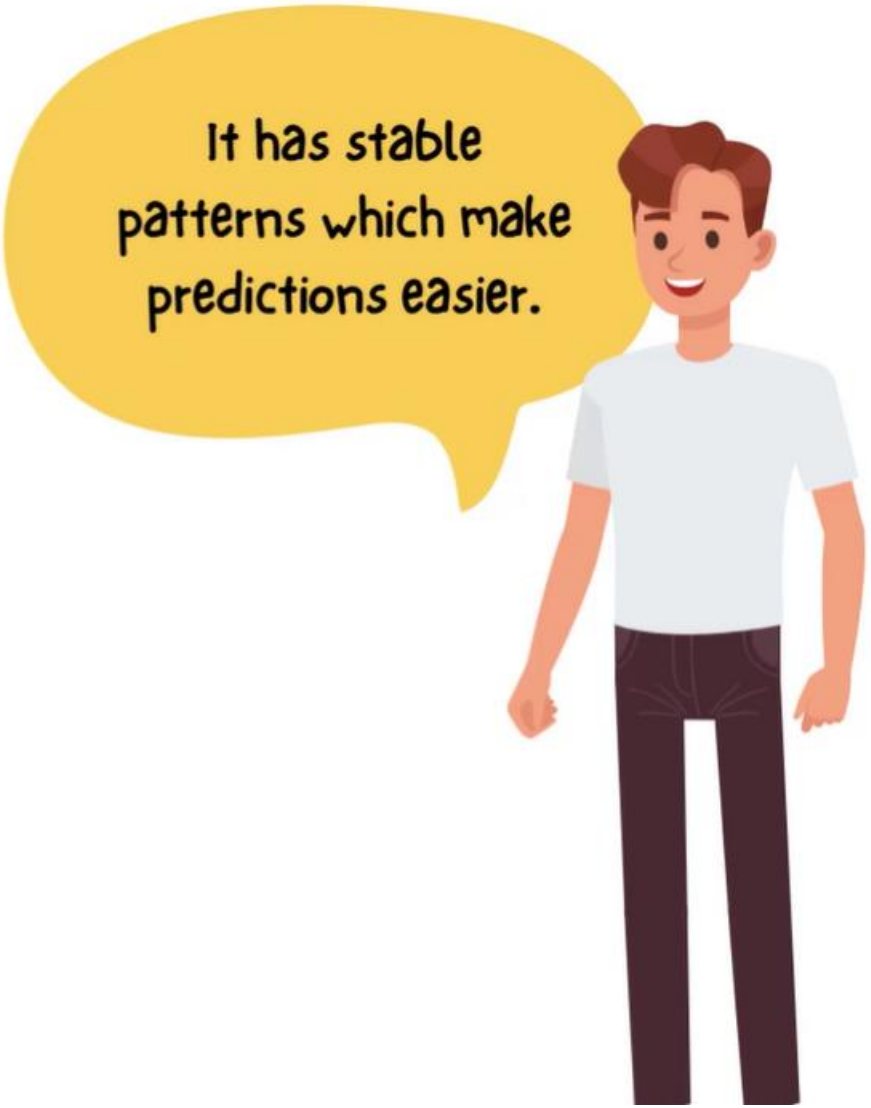


Cognate/Professional Electives

consistent in speed (mean), shake (variance),
and rhythm (covariance) over time.

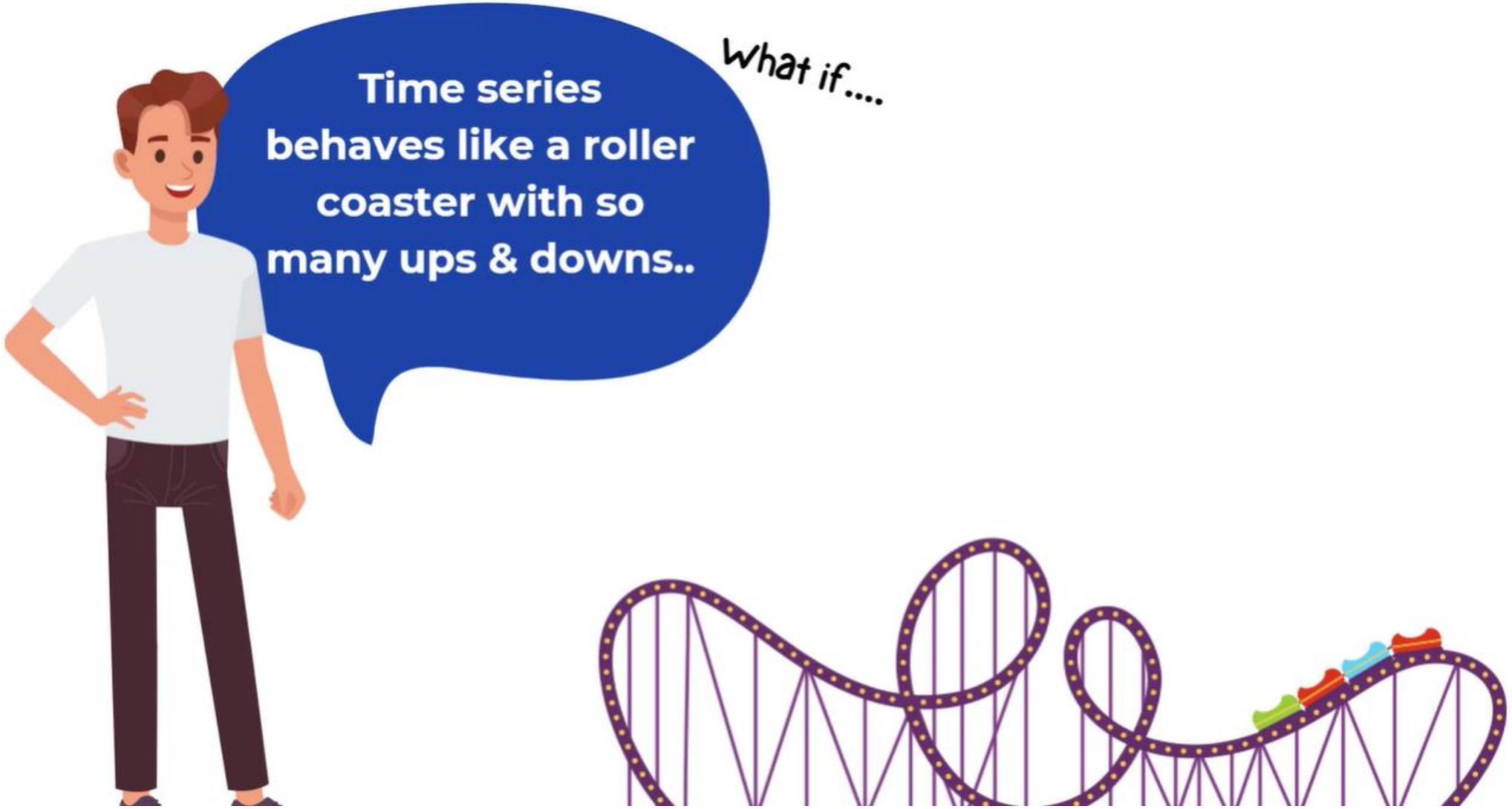
Cognate/Professional Electives

consistent in speed (mean), shake (variance), and rhythm (covariance) over time.



Cognate/Professional Electives

Cognate/Professional Electives

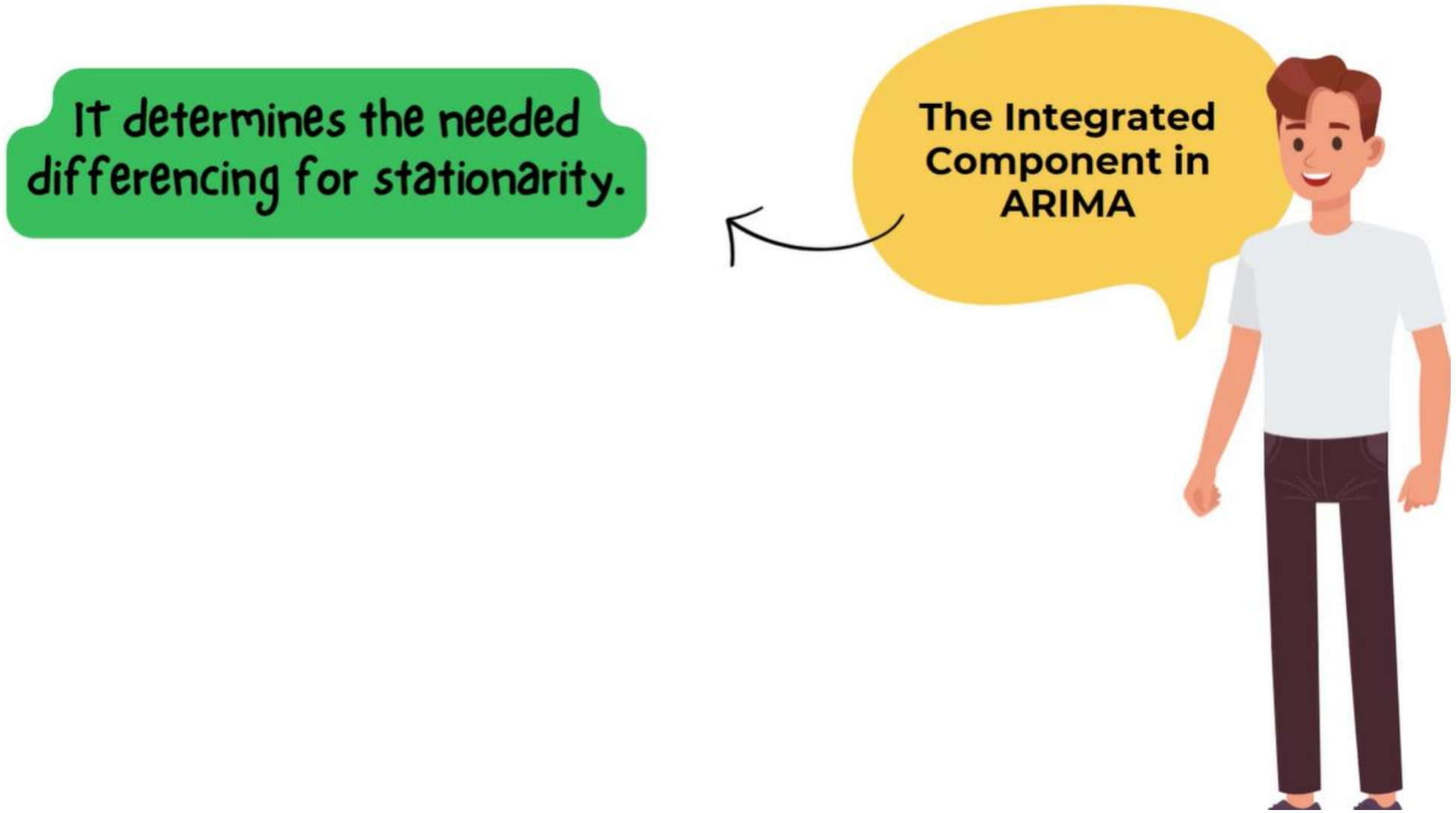


AUTOREGRESIVE INTEGRATED MOVING AVERAGE (ARIMA)

Cognate/Professional Electives

DIFFERENCING

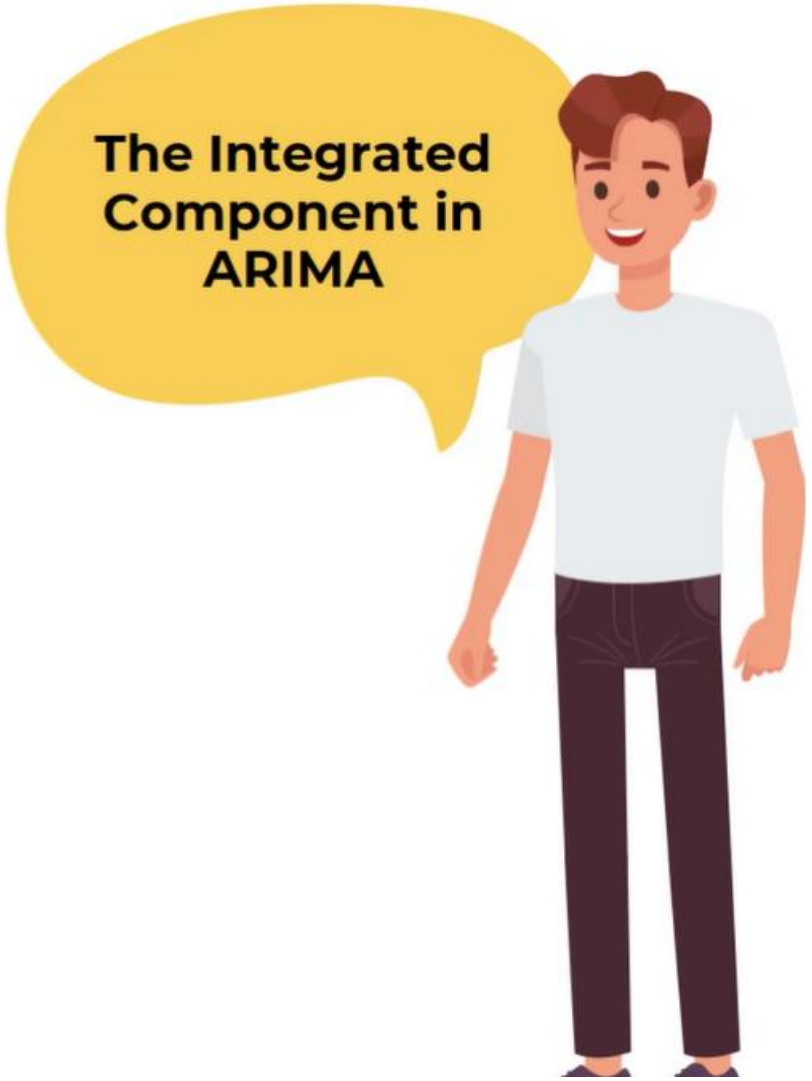
Subtracting consecutive days gives a steadier, predictable series.

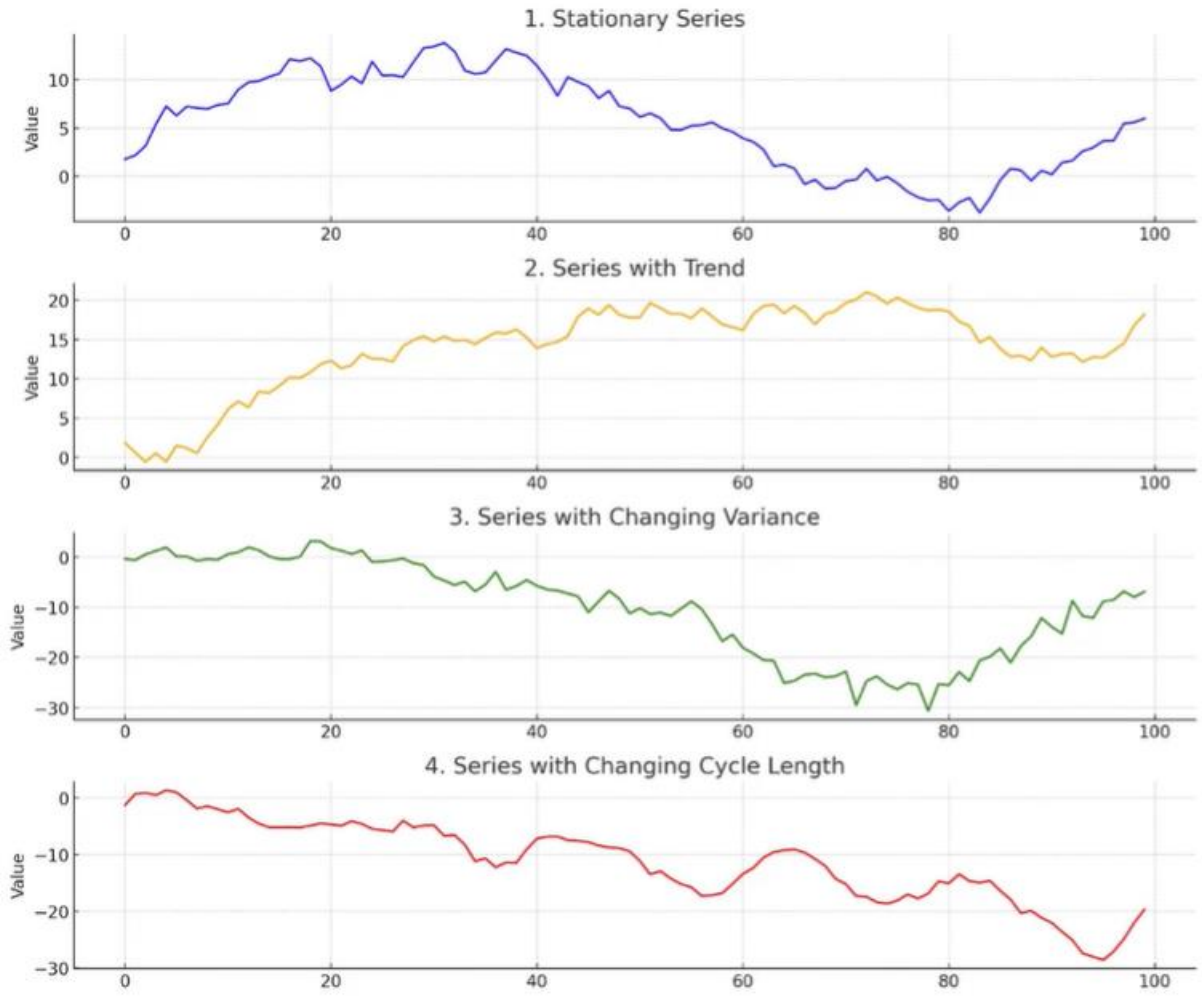

It determines the needed differencing for stationarity.
The Integrated Component in ARIMA

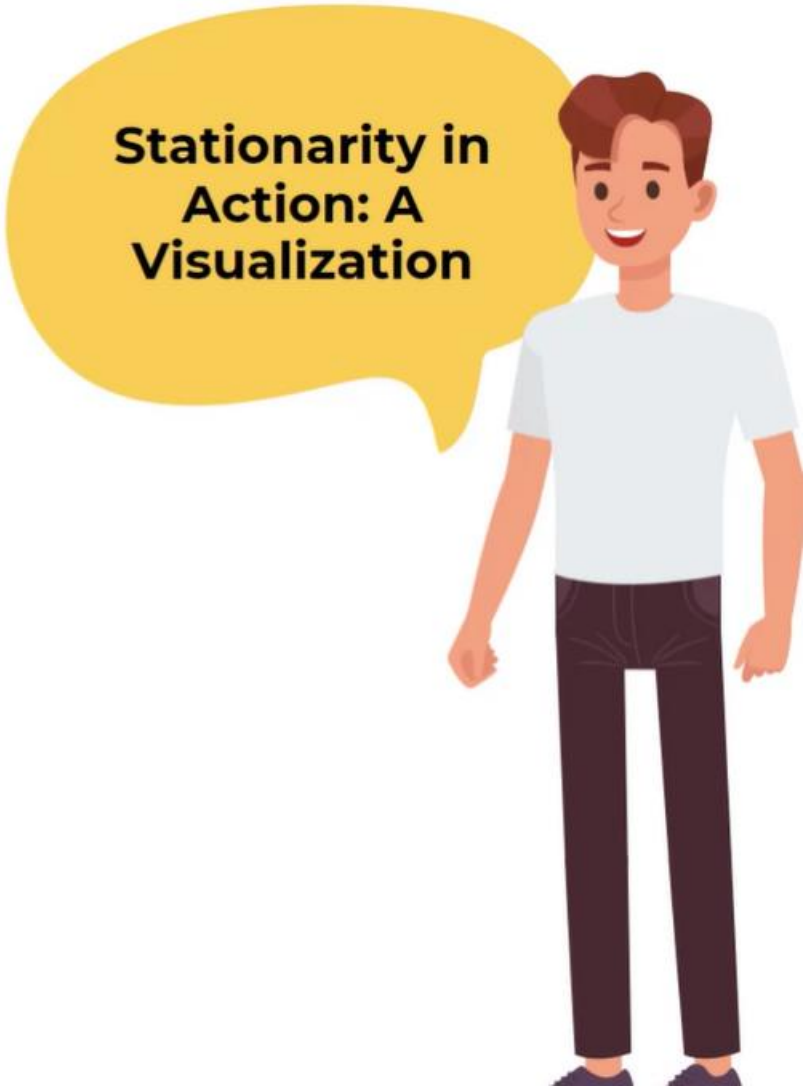
It determines the needed differencing for stationarity.

EXAMPLE

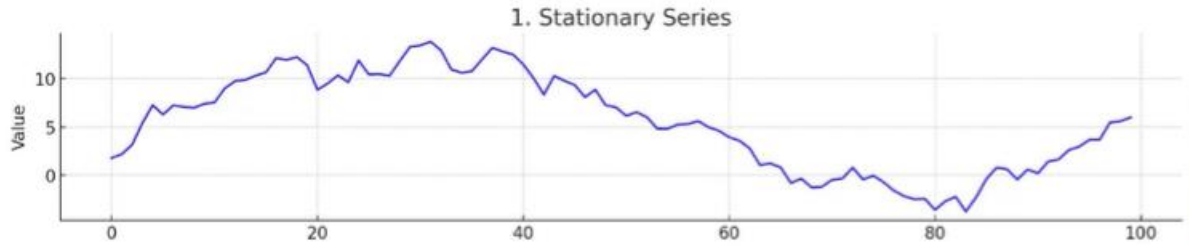
If a single differencing stabilizes our data, it's ARIMA with 'I' set at 1.

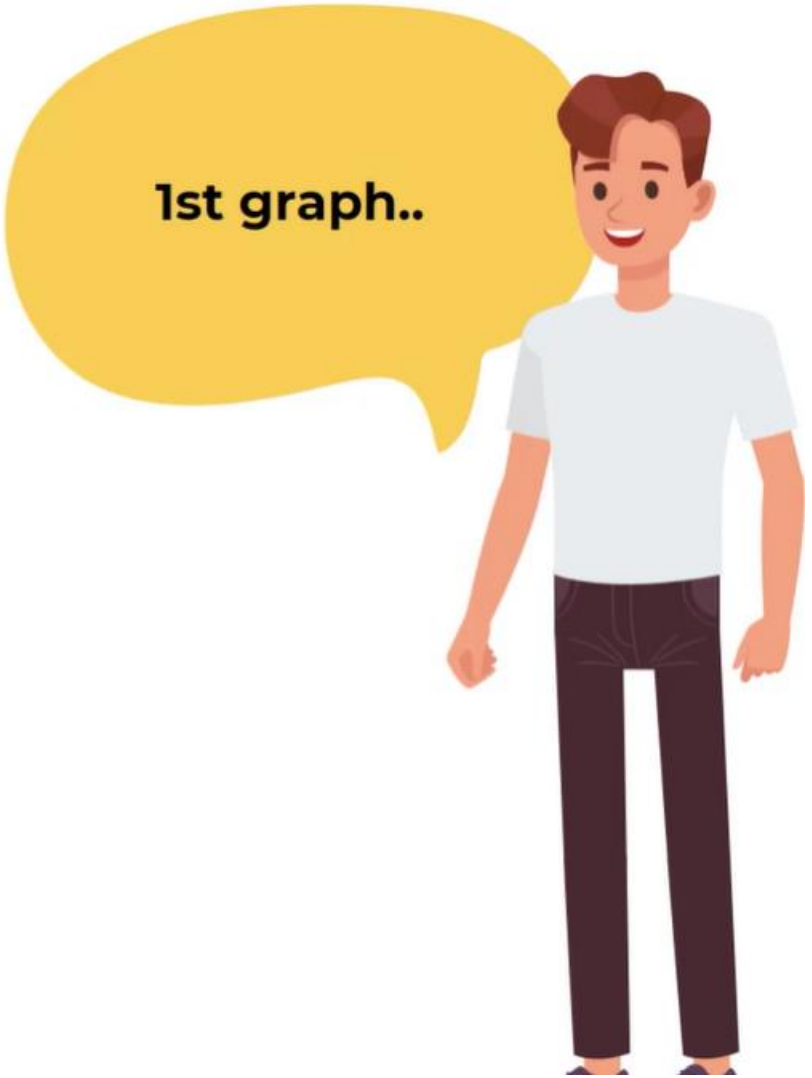



1. Stationary Series
2. Series with Trend
3. Series with Changing Variance
4. Series with Changing Cycle Length
Value


Stationarity in Action: A Visualization

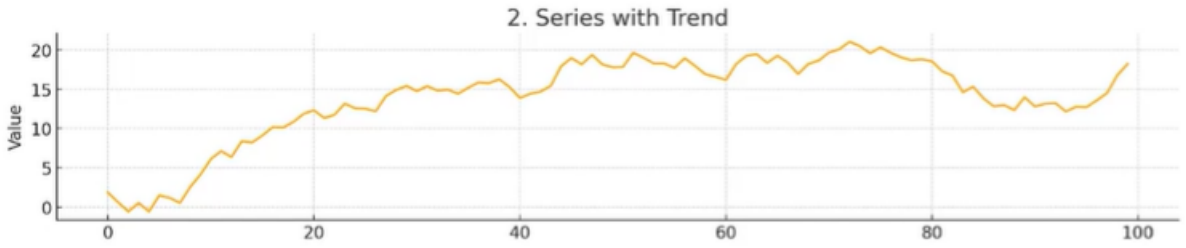
Cognate/Professional Electives

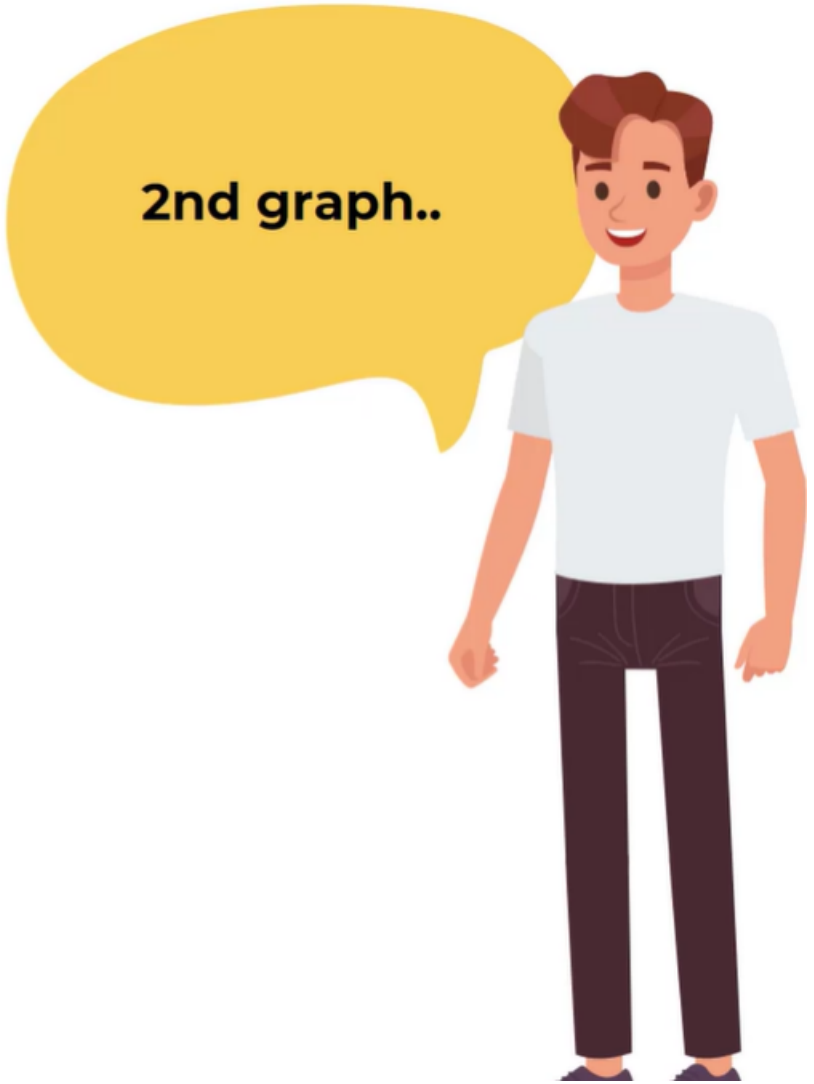




- Stable patterns
- Stationary

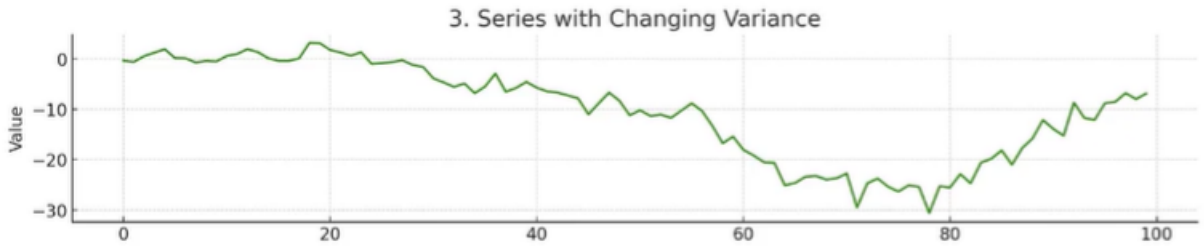
Cognate/Professional Electives



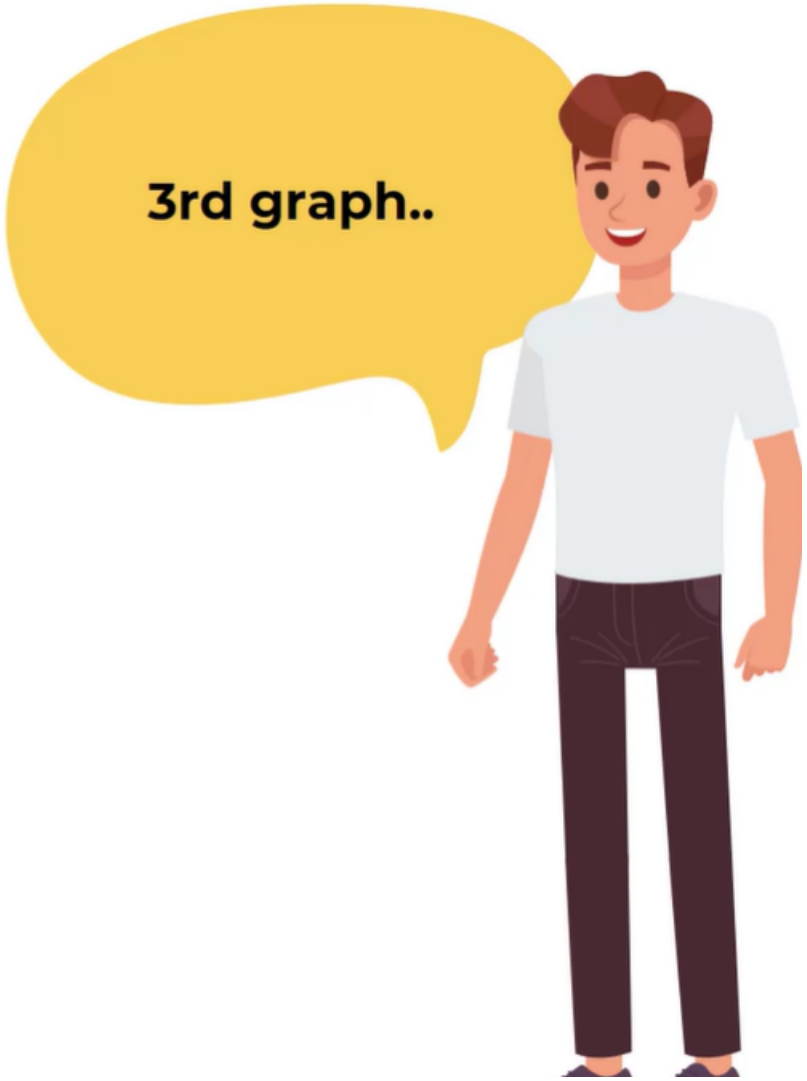


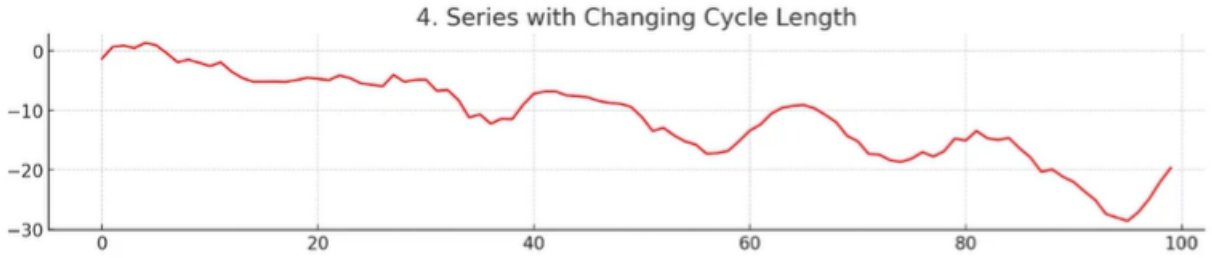
- Growing mean
- Non-stationary.

Cognate/Professional Electives

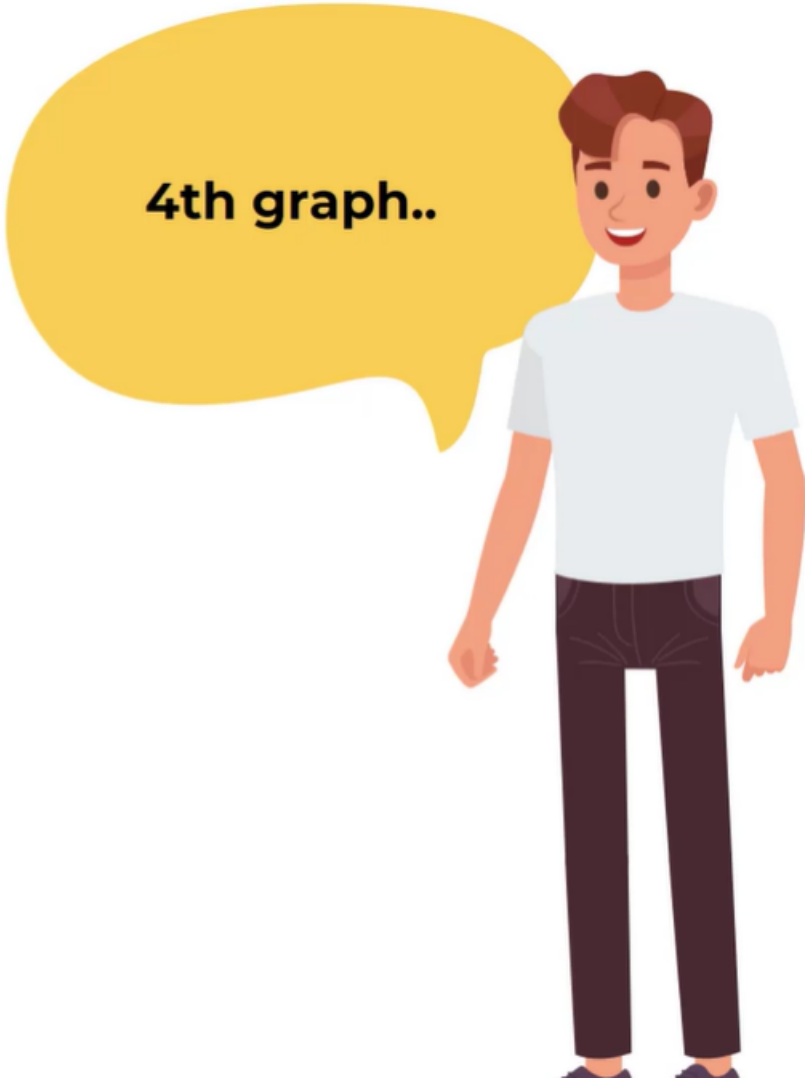


- Varying amplitudes
- Non-stationary

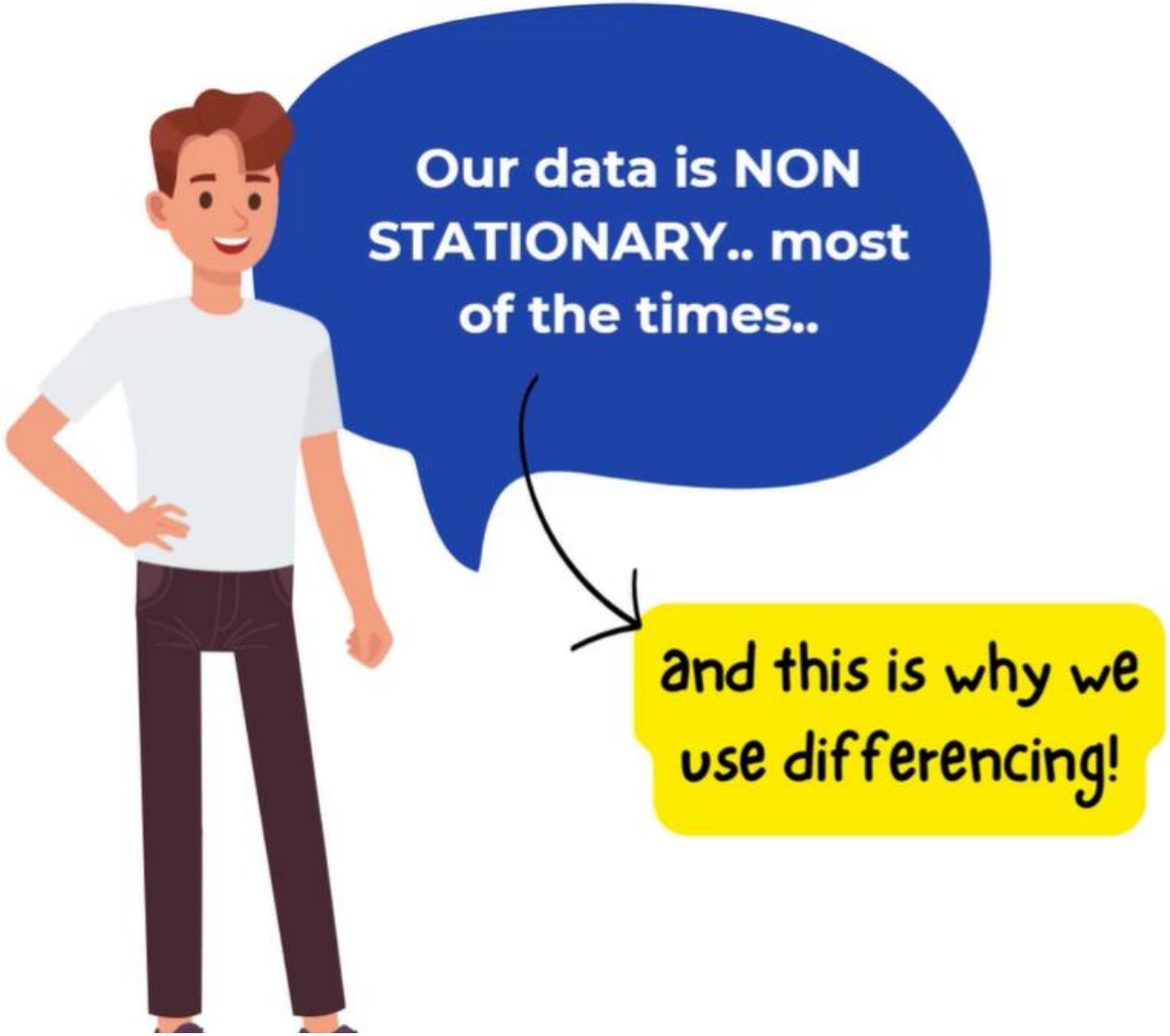


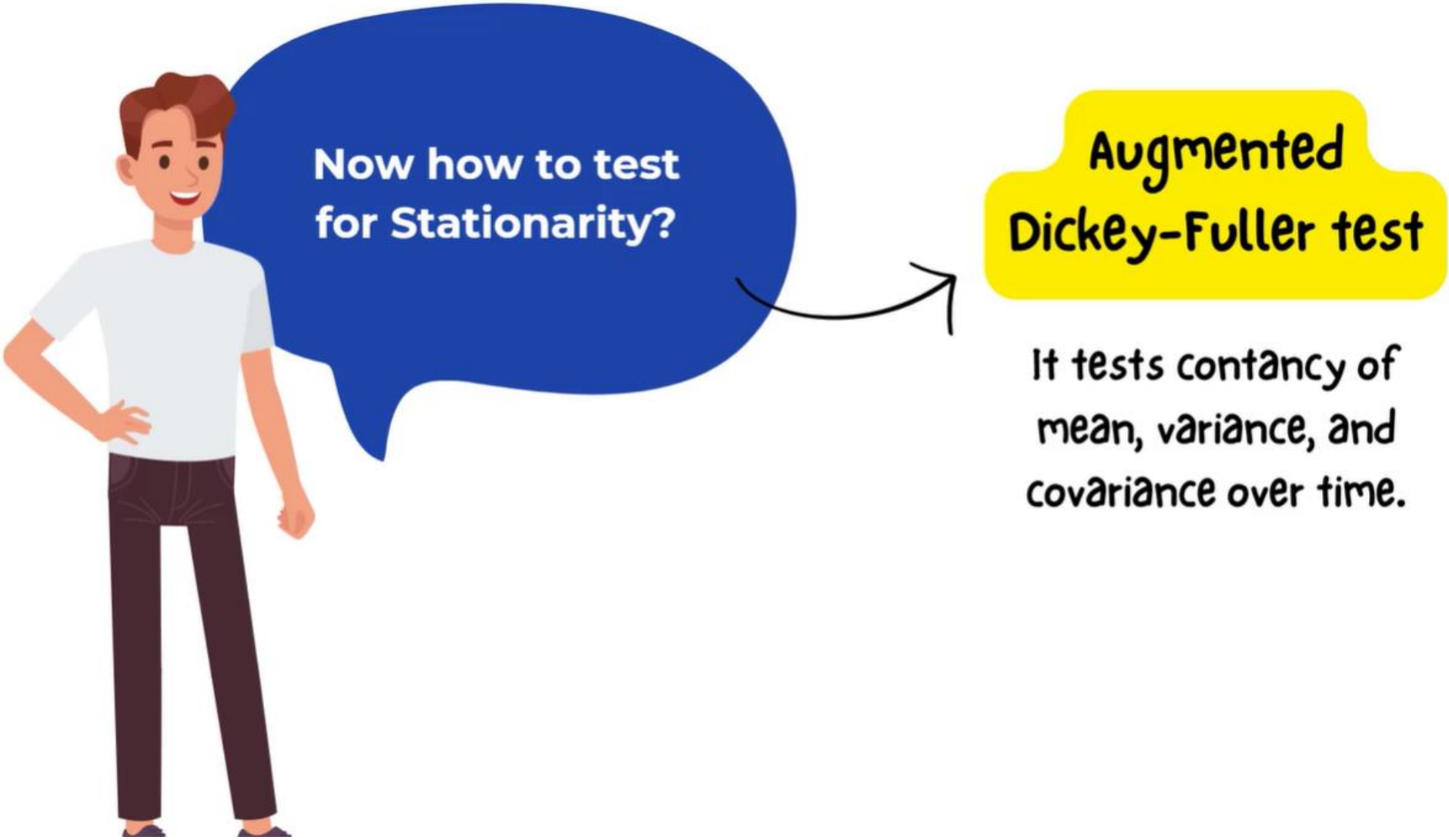


- Varying cycles
- Non-stationary



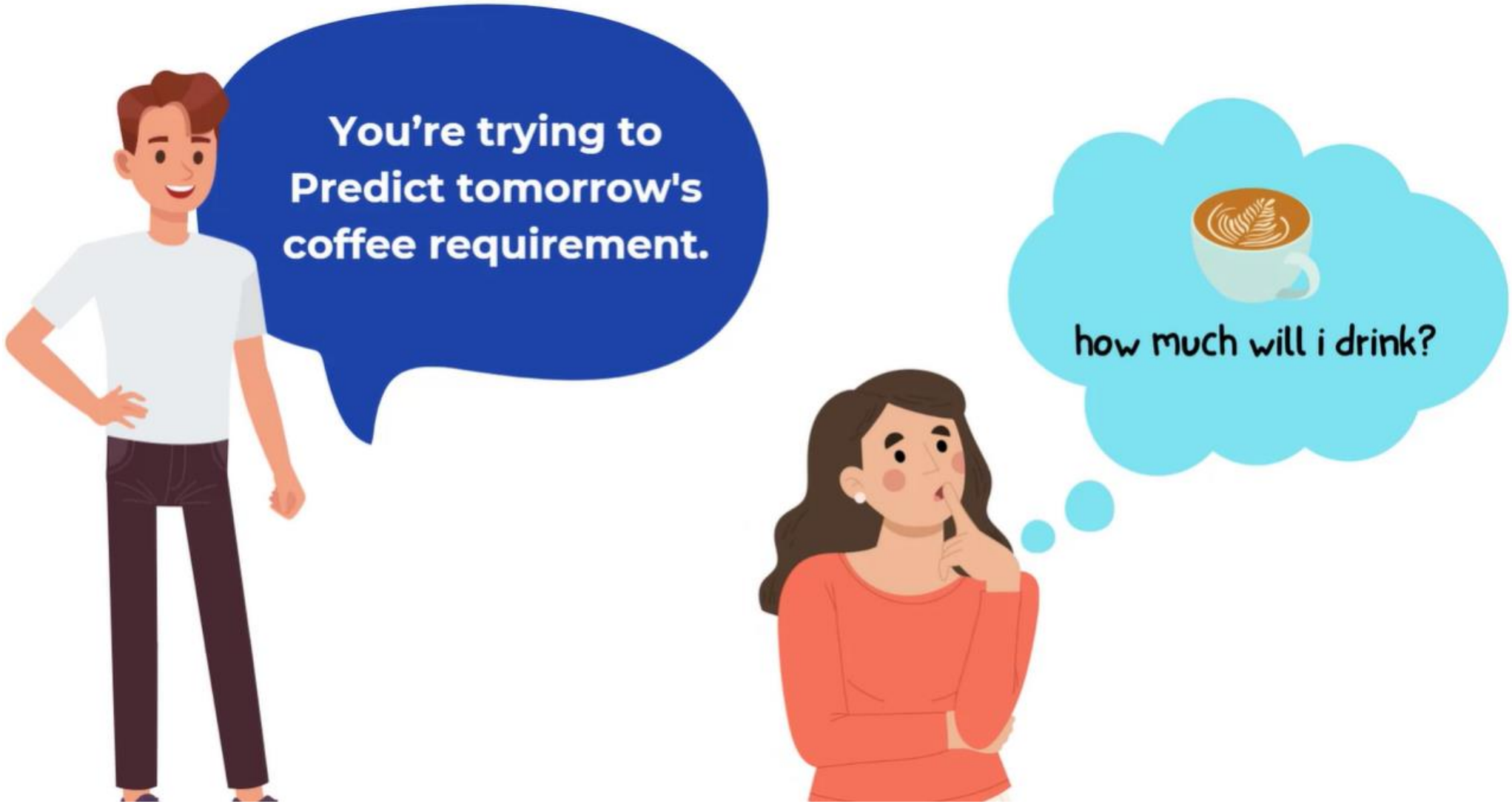
Cognate/Professional Electives


Our data is NON STATIONARY.. most of the times..
and this is why we use differencing!


Now how to test for Stationarity?
Augmented Dickey-Fuller test
It tests contancy of mean, variance, and covariance over time.

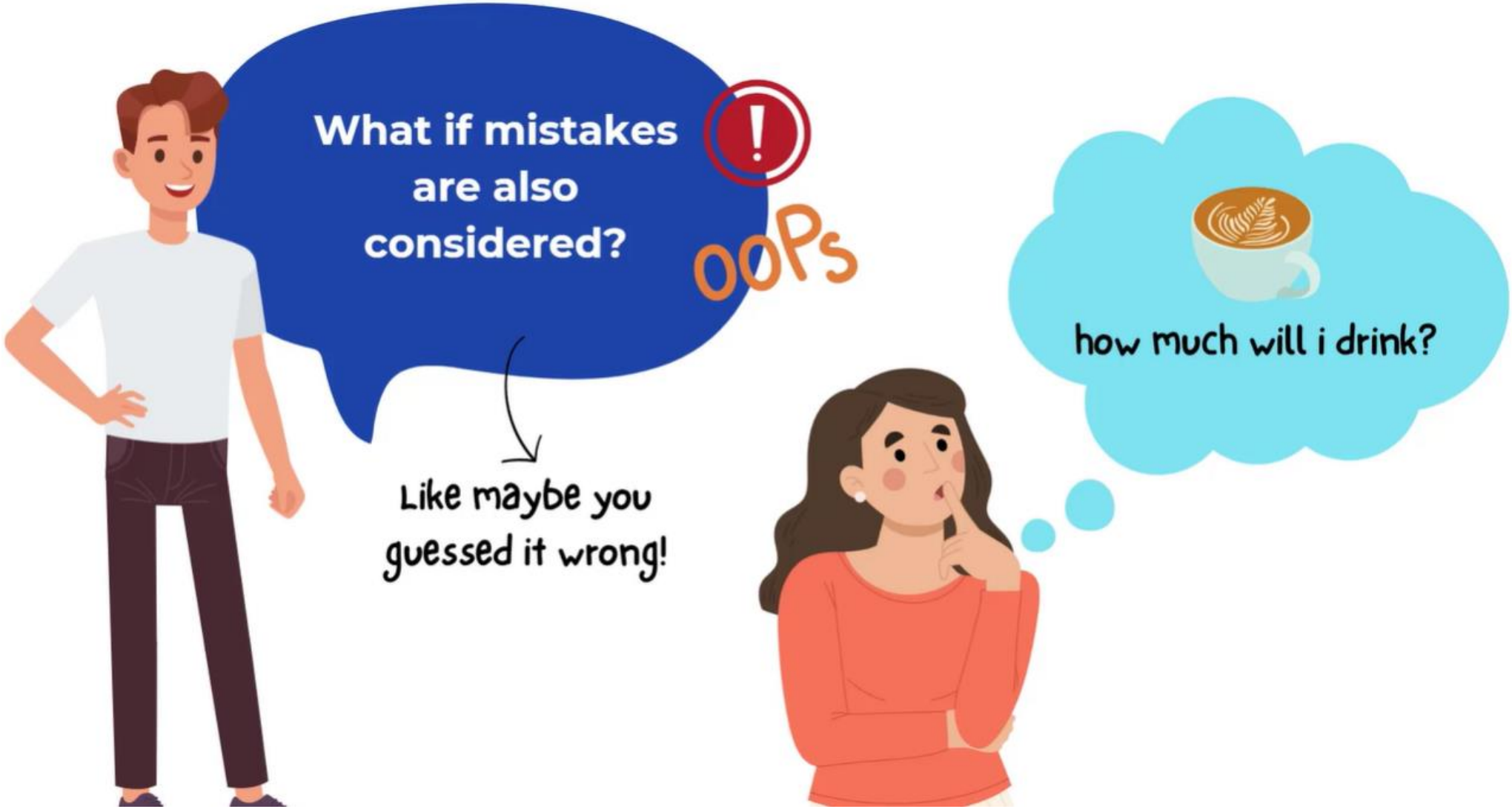
Moving Average Component

Cognate/Professional Electives

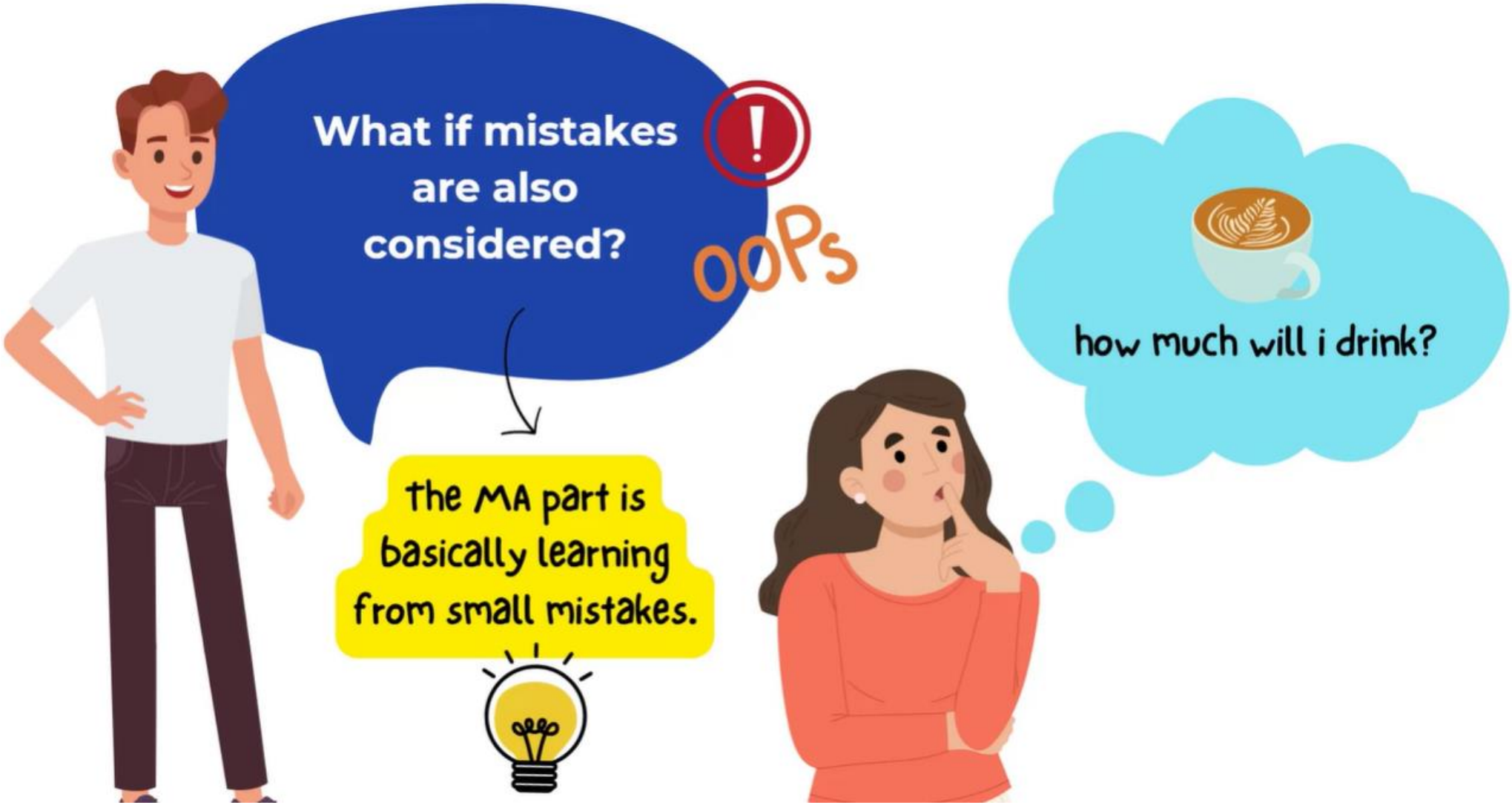


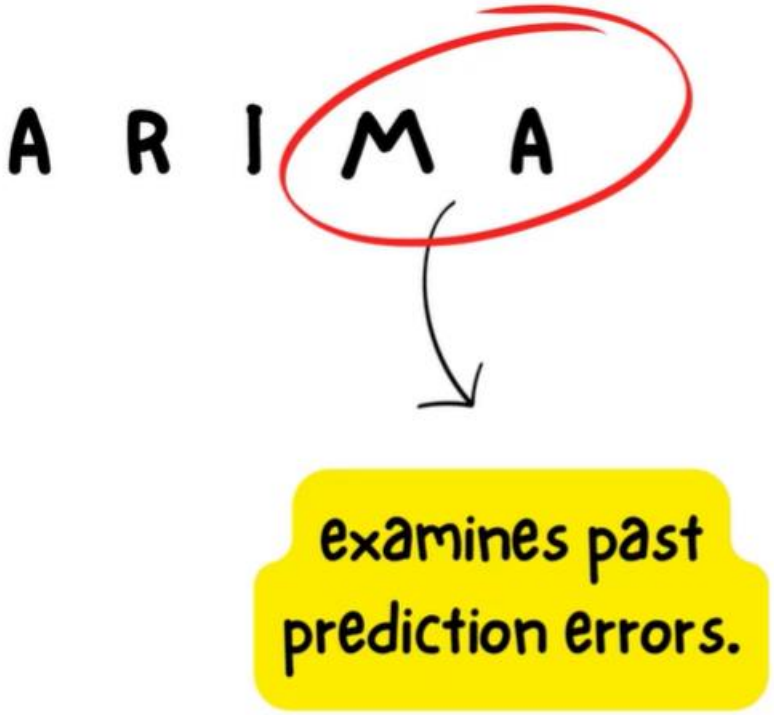
Cognate/Professional Electives

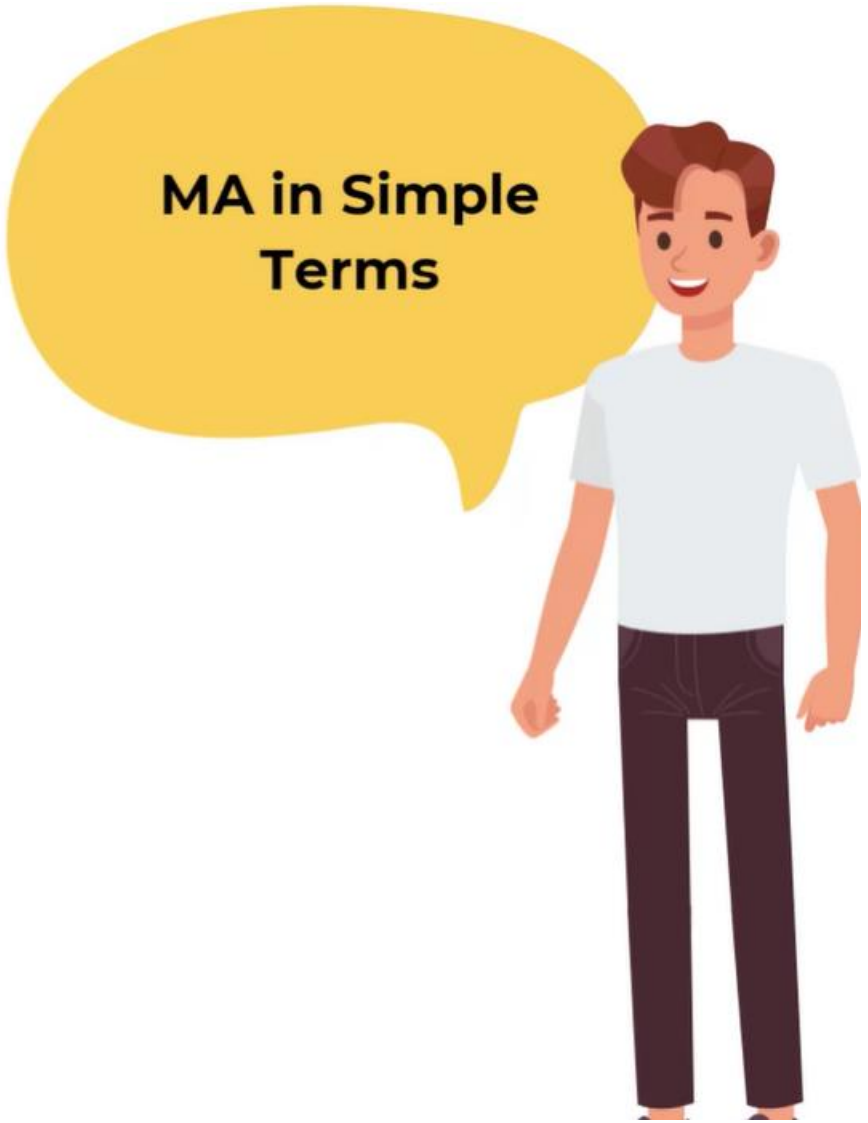
Cognate/Professional Electives

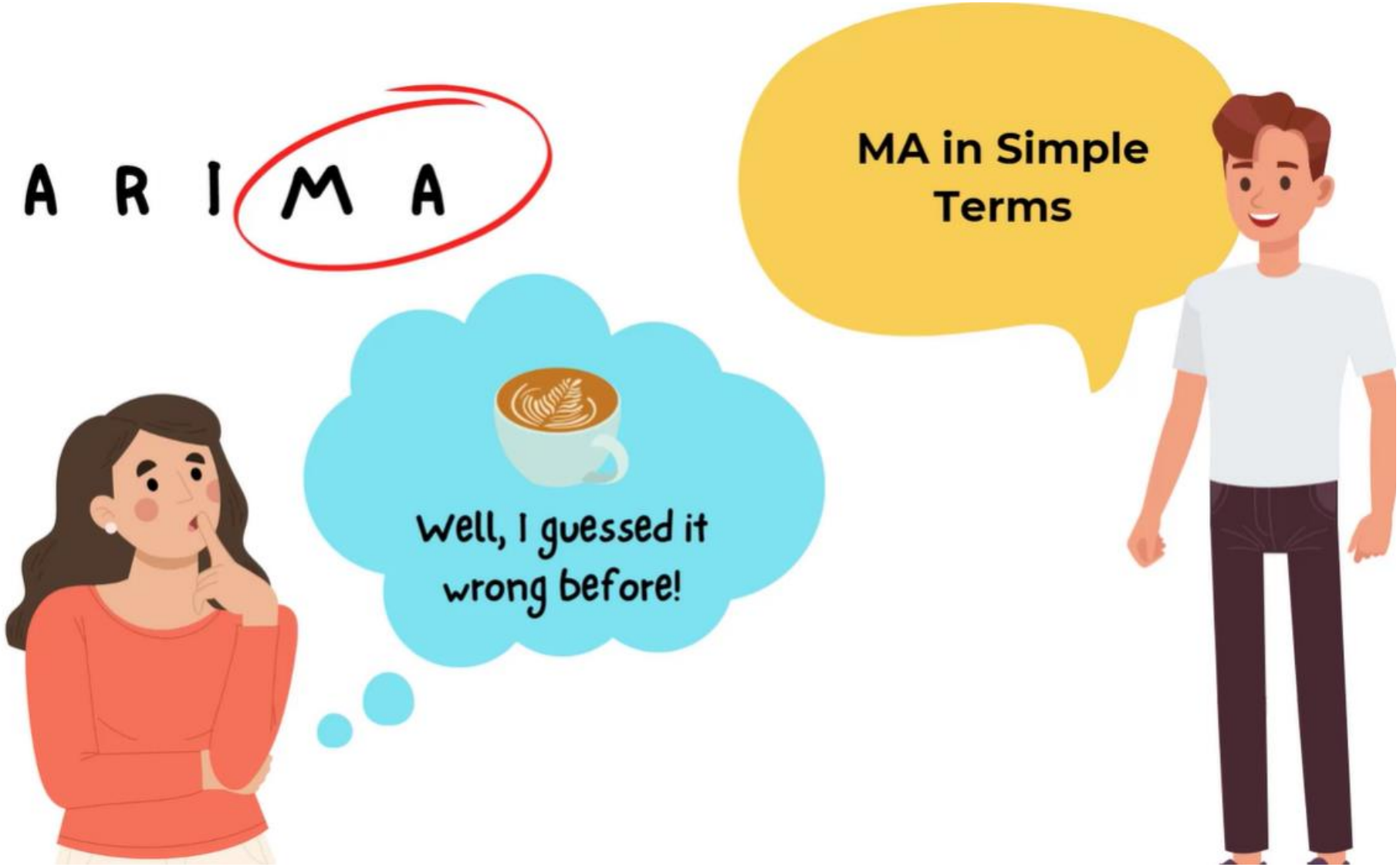


Cognate/Professional Electives

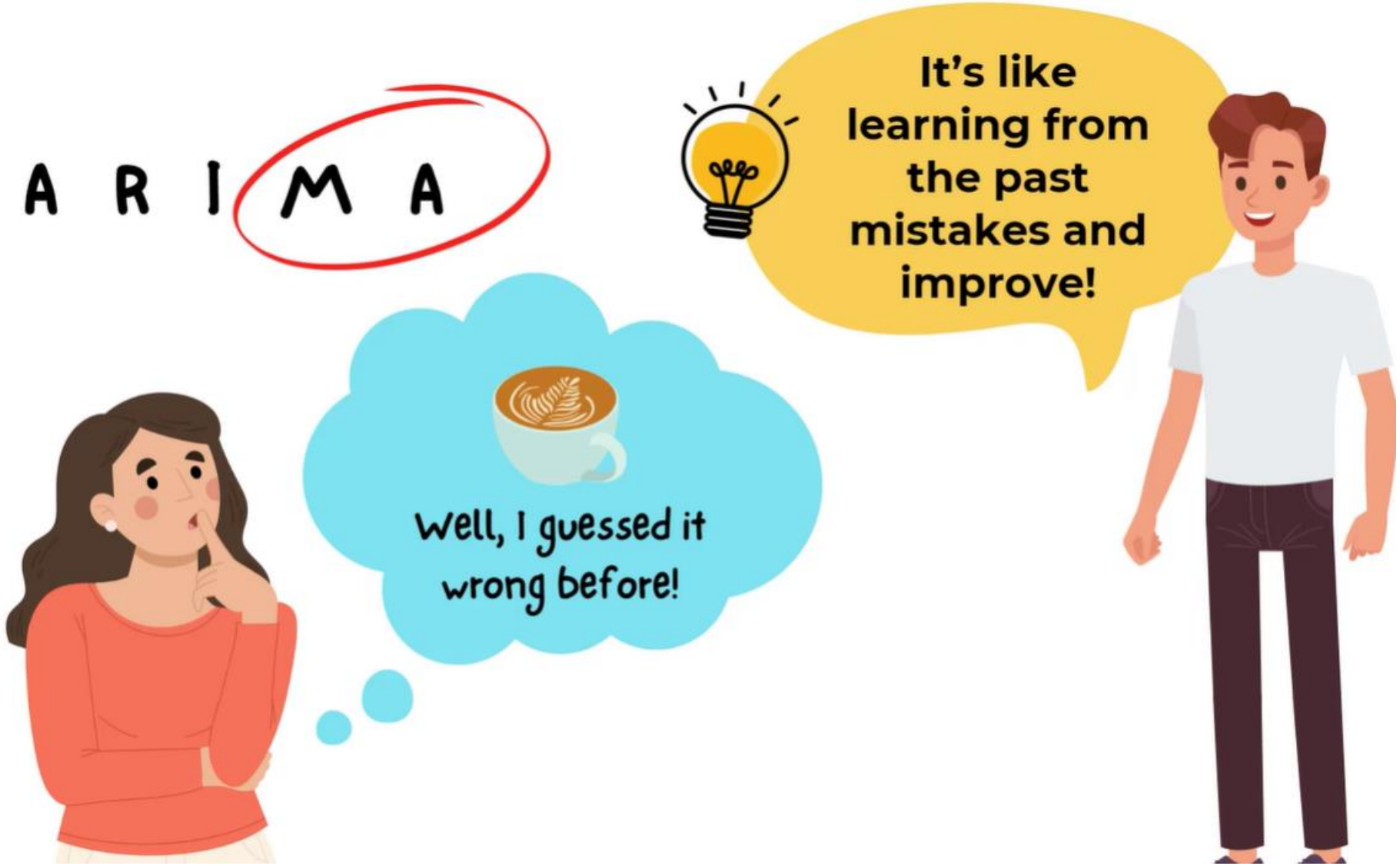



A R I M A
examines past prediction errors.


MA in Simple Terms

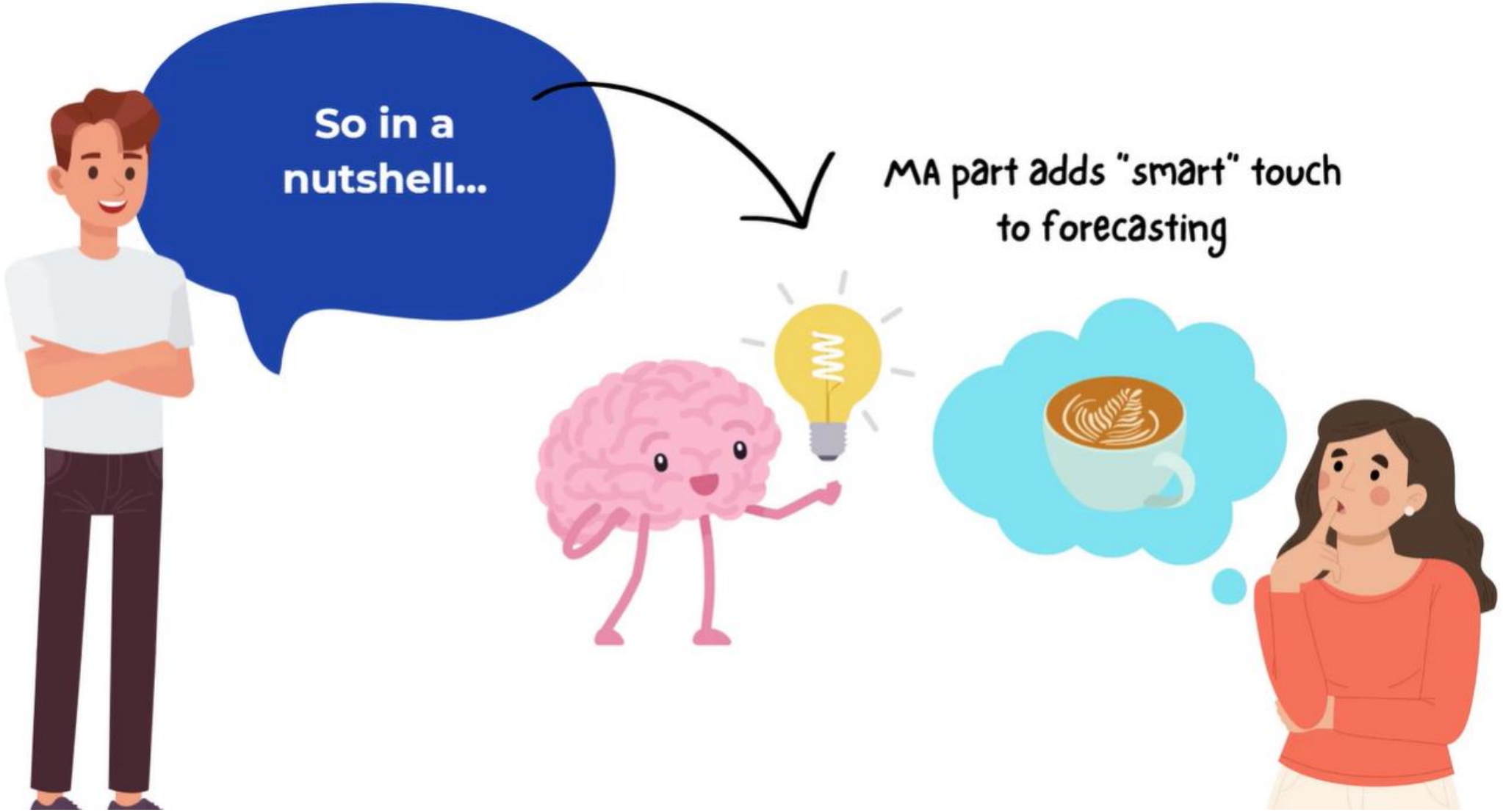

A R I M A
MA in Simple Terms
Well, I guessed it wrong before!

Cognate/Professional Electives



Cognate/Professional Electives

Cognate/Professional Electives



Thank you very much for listening.