9 Vector Autoregression models

VAR models are just a system of AR models estimated together.
↳ A weakness of univariate models is the implied unidirectional r/ship, which is unrealistic.

Steps for forecasting VAR models:

1. Test for stationarity
   ↳ If using non-stationary variables, OLS estimation might cause spurious regression

2. Determine the optimal lag length for the system
   ↳ this is key b/c otherwise output will be misleading.
   ↳ to do this, experiment w/ diff. lag lengths, optimising for model selection criterion, ensuring residuals are uncorrelated
   ⇒ start w/ smallest lag suggested by criterion, check resids
   & continue increasing lags until residuals are uncorrelated
   ↳ Breusch-Godfrey LM test: H_0: no AR of orders 1-q, H_a: AR " " " "

3. Estimate the model w/ number of lags from previous steps & interpret output
   i. check if all roots of the characteristic polynomial are < 1 ∀ ∴ stable

   ii. check the F-test for the model for significance
   ↳ Don't interpret coeffs. VAR models are very often overparameterised w/ little economic content

4. Forecast & reconstruct

- Because you're forecasting stationary variables you probably want the relevant level, so use cumsum()
  - e.g. UNR_eq = ts(UNR[length(UNR)] + cumsum(DUNR_eq), start ...)