Exercise – Function – Auxiliary

This function defines the auxiliary model used in the indirect inference procedure. Specifically, it estimates the autoregressive coefficient from an AR(1) model fitted to a given time series `y`. It first specifies an ARIMA(1,0,0) model, meaning an AR(1) without differencing or moving average terms. Then, it estimates the model parameters using the input data, suppressing output messages for cleaner execution. Finally, it extracts the AR(1) coefficient from the estimated model and returns it as `beta_hat`. This estimated value serves as a summary statistic in the indirect inference framework, helping to compare simulated and observed data.

```
% Exercise - Function - Auxiliary

% This function estimates the auxiliary parameter from a given time
% series. Specifically, it fits an AR(1) model and extracts the
% autoregressive coefficient (beta).
function beta_hat = auxiliary(y)
    %% Specify AR(1) model structure
    model = arima(1,0,0);
    %% Estimate AR(1) parameters from input time series
    est = estimate(model,y,'Display','off');
    %% Extract estimated AR(1) coefficient (auxiliary parameter)
    beta_hat = est.AR{1};
end
```