# LLM Answer Report

## Question:

What is Arima model

## Answer:

An ARIMA (Autoregressive Integrated Moving Average) model is a statistical model used for time series analysis. It's defined by three parameters: p, d, and q. 'p' represents the order of the autoregressive (AR) part, 'd' the degree of differencing (I), and 'q' the order of the moving average (MA) part. The model combines autoregressive, integrated, and moving average components to capture patterns in time-dependent data.  
  
  
The model is fitted to data using techniques such as minimizing the AICc (Corrected Akaike Information Criterion) and stepwise search to find optimal values for p, d, and q. This involves iteratively adjusting the parameters and evaluating the model's fit until the best model is found.  
  
  
The `Arima` function in R uses a specific formulation for implementing this model. Kalman smoothing can be applied to improve estimation and handle missing data or seasonal adjustments.  
  
  
SOURCES: pages 73, 74, 79, 177

## Sources:

1. Page 2.0 — . . . . . . . . . . . . . . . . . . . . 73 7.3 ARIMA models . ....

2. Page 77.0 — • Select p,q by minimising AICc. • Use stepwise search to traverse model space. Step 1: Select current model (with smallest AIC) from: ARIMA(2,d,2) ARIMA(0,d,0) ARIMA(1,d,0) ARIMA(0,d,1) Step 2: Consi...

3. Page 99.0 — ... 0 φr−1 0 ... 0 1 φr 0 0 ... 0   xt−1 +   1 θ1 ... θr−1   et The arima function in R is implemented using this formulation. 9.5 Kalman smoothing W...

4. Page 78.0 — Forecasting: principles and practice 79 8/ arima models 177 1. Plot the data. Identify unusual observations. Understand patterns....

5. Page 73.0 — Forecasting: principles and practice 74 ARIMA(p,d,q) model AR: p= order of the autoregressive part I: d= degree of ﬁrst diﬀerencing involved MA: q= order of the moving average part....