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# FORECASTING

## PRINCIPLES AND PRACTICE

A comprehensive introduction to the latest forecasting methods using R. Learn to improve your forecast accuracy using dozens of real data examples.



3RD EDITION

 **OTexts**  
Open Texts Publishing

## 9. ARIMA models

### 9.6 Estimation and order selection

[OTexts.org/fpp3/](http://OTexts.org/fpp3/)

# Maximum likelihood estimation

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- MLE is very similar to least squares estimation obtained by minimizing

$$\sum_{t=1}^T e_t^2$$

- The `ARIMA()` function allows CLS or MLE estimation.
- Non-linear optimization must be used in either case.
- Different software will give different estimates.

# Information criteria

## Akaike's Information Criterion (AIC):

$$\text{AIC} = -2 \log(L) + 2(p + q + k + 1),$$

where  $L$  is the likelihood of the data,  $k = 1$  if  $c \neq 0$  and  $k = 0$  if  $c = 0$ .

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Good models are obtained by minimizing either the AIC, AICc or BIC. Our preference is to use the AICc.