



Analyttica Datalab

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What is Bayesian Information Criterion (BIC)?

Bayesian information criterion (BIC) is a criterion for model selection among a finite set of models. It is based, in part, on the likelihood function, and it is closely related to Akaike information criterion (AIC).

When fitting models, it is possible to increase the likelihood by adding parameters, but doing so may result in overfitting. The BIC resolves this problem by introducing a penalty term for the number of parameters in the model. The penalty term is larger in BIC than in AIC.

BIC has been widely used for model identification in time series and linear regression. It can, however, be applied quite widely to any set of maximum likelihood-based models.

Mathematical Expression:

Mathematically BIC can be defined as-

$$BIC = \ln(n)k - 2 \ln(\hat{L}).$$

Bayesian Information Criterion formula

\hat{L} is the maximized value of the likelihood function of the model

n is the number of data points

k is the number of free parameters to be estimated

Application & Interpretation:

The models can be tested using corresponding BIC values. Lower BIC value indicates lower penalty terms hence a better model.

Read also AIC statistics.

Though these two measures are derived from a different perspective, they are closely related. Apparently, the only difference is BIC considers the number of observations in the formula, which AIC does not.

Though BIC is always higher than AIC, lower the value of these two measures, better the model.

Practice Dataset:

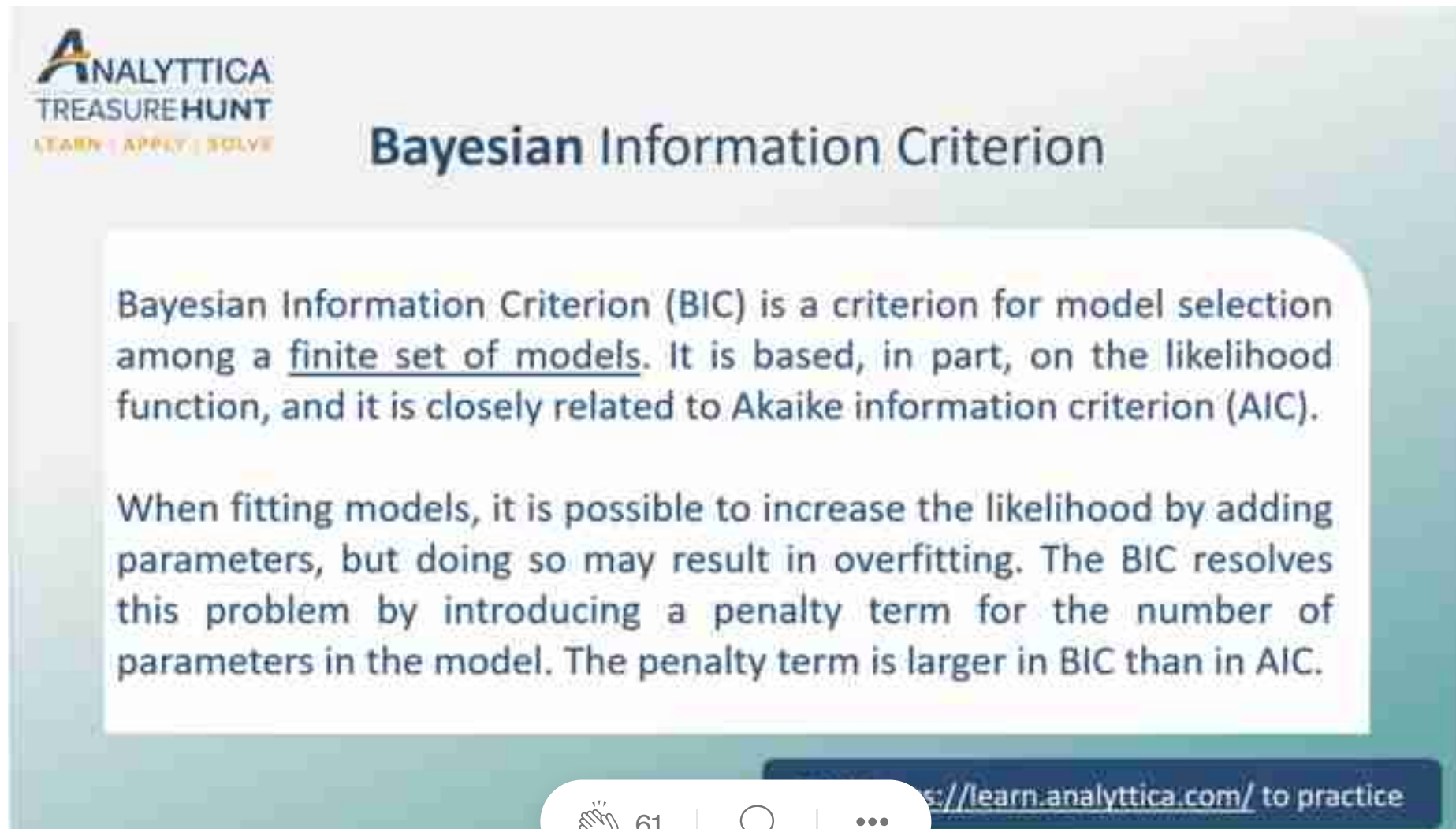
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Akaike Information Criterion(AIC)

The ‘Akaike information Criterion’ is a relative measure of the quality of a model for a given set of data and helps in model selection among a finite set of models. It uses the maximized likelihood estimate and the number of parameters to estimate the information lost in the model...

Machine Learning

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Concordance Check-Analytics Function Series

It is a measure of the discriminating power of the logistic equation. It varies from 0.5 (the model's predictions are no better than random) to 1 (the model always assigns higher probabilities to dependent=1 cases than to dependent=0 cases for any pair involving dependent=0 and...

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Data Science

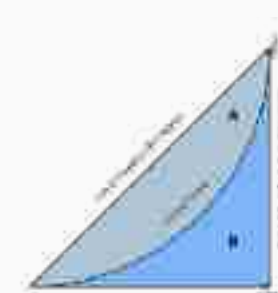
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