Naive Linear Score [Not proper, Local, Feasible]

$$S(p, v) = -p(v) \tag{1}$$

The Naive Linear score has been used for many years, for example it is discussed in Friedman 1983 [2]. This score uses the probability density that the forecast would ascribe to the occurrence of a given observation value. This is intuitive in that: if an observation occurs at a point that the forecast thought highly unlikely then the forecast would score badly - in other words this is a Feasible score. This is a Local score in that it depends only on the value of PDF at the outcome. This score is not Proper however [1] (i.e. a forecaster can get a better score by giving a forecast that is different to the probability of the event that occurs).

Bibliography

[1] J. Brocker and L. Smith. Scoring probabilistic forecasts: The importance of being proper. Weather and Forecasting, 22:382, 2005.

[2] D. Friedman. Effective scoring rules for probabilistic forecasts. Management Science, 29(4), April 1983.