Introduction to Probability Calibration:

Mansi Sarda · Following

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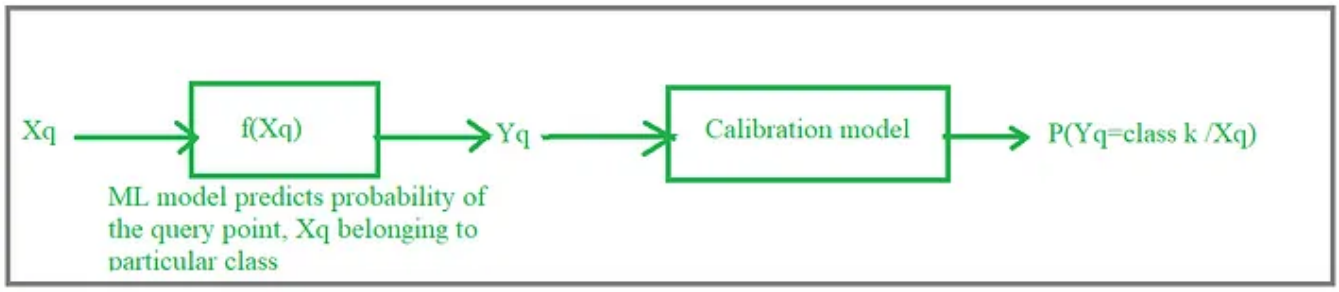
Probability Calibration refers to a method of calibrating probabilities which are predicted by various machine learning models like Gaussian Naive Bayes in order to have most accurate probabilities.

CalibratedClassifierCV outputs the calibrated probabilities using two methods — sigmoid and isotonic.

Why we need Probability Calibration?

Some important metrics such as logloss, Brier score takes the probability predicted by the model in order to find the loss. In such cases the probabilities which are not calibrated may not give good results. In addition to that not all classifiers provide well-calibrated probabilities, some being over-confident while others being under-confident. Thus, a separate calibration of predicted probabilities is desirable as a postprocessing.



When to apply Probability Calibration

Methods/Types of Probability Calibration provided by CalibratedClassifierCV :

1. Sigmoid — Sigmoid calibration is also called Platt Calibration.

$$P(y = 1|x) = \frac{1}{1 + \exp(Af(x) + B)}$$

As given in the above picture, f(x) is the predicted probability. P(y=1|x) is the calibrated probability. A and B are two scalar parameters that are learned by the algorithm which is calculated by solving an optimization problem. Sigmoid is only useful in cases where the actual probabilities are also sigmoidal in nature.

Cross Validation or cv parameter of CalibratedClassifierCV :

This determines the cross validation splitting strategy. It either takes any integer as cv in order to perform k-fold cross validation or “prefit” is passed

if the entire data is to be used for calibration.

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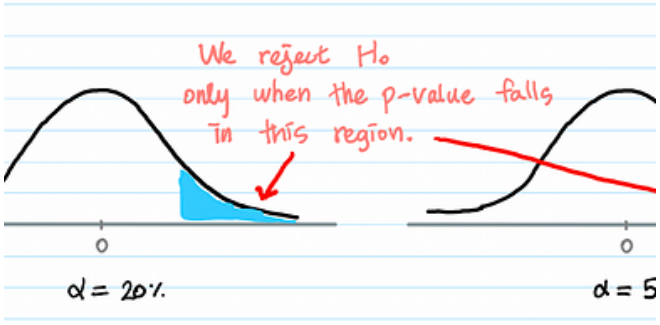

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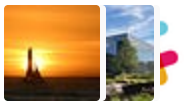

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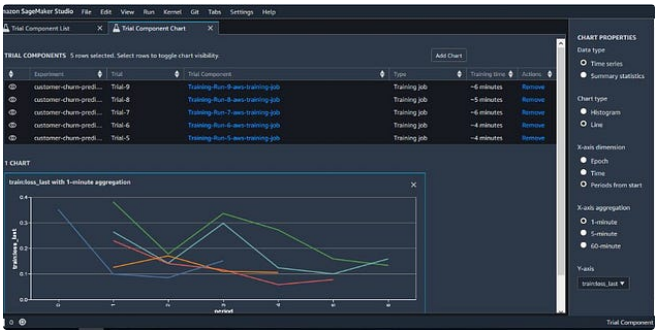

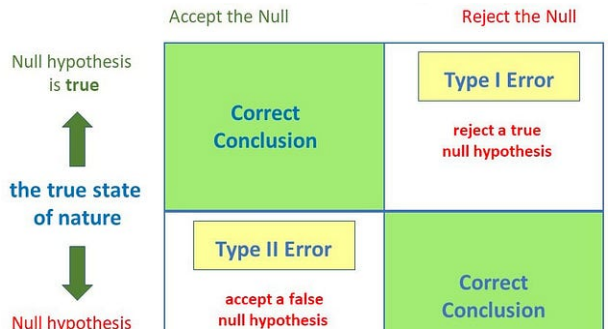

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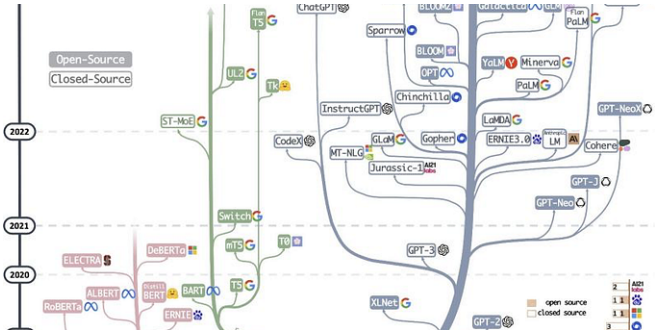

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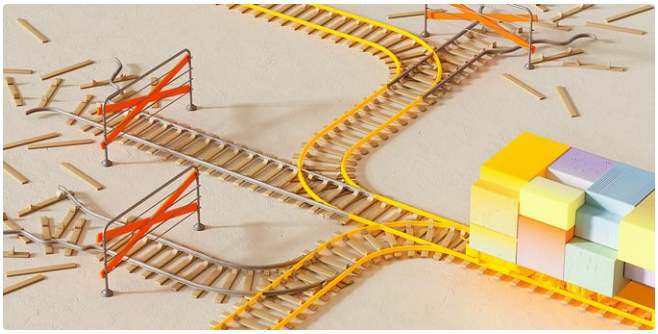

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