What is an AutoML?

Machine Learning, the most popular technology currently used in almost every field. But what about those who are not an expert, how will they use this powerful technology which is limited to some data scientists, machine learning enthusiasts, or researchers, which are low in number and slowly rising. To bridge this gap, the concept of Automated Machine Learning came into the picture.

It automates the process of applying machine learning in real-world problems covering the complete pipeline from the raw dataset to the deployable machine learning model. It allows you to provide the labeled training data as input and returns an optimized model as output.

Why we need AutoML?

In a typical machine learning application, the raw data may not be in a form that all algorithms can be applied to it. Experts have to prepare data properly by applying appropriate data pre-processing, feature engineering, feature extraction, and feature selection methods. After these steps, they perform algorithm selection and hyperparameter optimization to maximize the predictive performance of the model. All these steps induce challenges, which leads to a significant hurdle to get started with machine learning.

AutoML drastically simplifies these steps for non-experts.

What are the targets of automation?

Automated machine learning targets various stages of the machine learning workflow like Data preparation, for example, detection of column type boolean or text, column intent detection like column is a target or a label, and task detection like binary classification or regression. It also takes care of feature engineering like feature selection, feature extraction, detection and handling of skewed or missing data. Model selection and its hyperparameter optimization is an important part of automation. AutoML is also capable of selecting evaluation metrics, validation procedures, and can detect data leakage or any misconfiguration.

As many of these steps can only be performed by ML experts, AutoML was proposed as an artificial intelligence-based solution to apply machine learning without much expertise.

What are the various AutoML services?

You will find various AutoML heroes out there like Google one of the leading tech-giants has released the Cloud AutoML for making custom machine learning models, Data Robot, H2o.ai, Azure Machine Learning, and many more.

What are the open-source AutoML services?

If we talk about popular open-source AutoML software, we have Auto-Keras, developed by DATA Lab at Texas A&M University which provides an automated architecture and hyperparameter search for deep learning models. and auto-sklearn, for Scikit learn library used for binary classification, multiclass classification, and regression.

So that's was all about AutoML and do share this with someone who needs it and let me know other open-source AutoML services in the comment section. Thank you.