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# Model Selection, Training, and Hyperparameter Tuning

## H20ML

H2O.ai provides an open-source machine learning and artificial intelligence platform called H2O. It supports a wide range of machine learning algorithms and offers capabilities for data preprocessing, model training, hyperparameter tuning, and deployment. H2O's primary components include:

* **H2O Core**: The base engine that powers various machine learning algorithms.
* **H2O AutoML**: Automated machine learning for model selection and hyperparameter tuning.
* **H2O Driverless AI**: An enterprise solution for automated machine learning and feature engineering.

## Support for various algorithms

* **Generalized Linear Models (GLM)**
* **Gradient Boosting Machines (GBM)**
* **Random Forest (RF)**
* **Deep Learning (DL)**

## Leaderboard

A close-up of numbers

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The Leaderboard is used to:

* **Compare Models**: It ranks models based on their performance metrics.
* **Identify the Best Model**: Helps in selecting the top-performing model for deployment or further analysis.
* **Track Model Performance**: Provides insights into the performance of different algorithms and hyperparameter configurations.

Includes details like the model type, performance metrics, and any specific attributes or settings used. Best model was at the top of the list and had less mse , rmse compared to other models

## Hyperparameter Tuning in H20ML

* Hyperparameter tuning is the process of finding the best set of hyperparameters for a machine learning model to improve its performance. Traditionally done manually, AutoML automates this process by systematically exploring different hyperparameter configurations.
* These are settings or configurations that control the learning process of a model, such as learning rate, number of layers, and tree depth. The range or set of possible values for each hyperparameter is called the Search Space. AutoML tools explore this space to find optimal values.
* Techniques used to search the hyperparameter space, such as grid search, random search, or more advanced methods like Bayesian optimization.

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## Leader Model Summary

A screenshot of a computer program

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## Evaluating the model

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