



it's about time

# Streaming Analytics - Change the Game

## Kx AutoML

### Making Machine Learning Easier and Faster with kdb+

Machine Learning aims to develop models without any explicit programming. Instead, machine learning algorithms allow models to 'learn' from historical data and experience. These models, once trained, can be used to infer relationships and hidden patterns within the data, and to predict values, classify events, and identify outliers.

While most of the focus of machine learning is on the algorithms themselves, the framework that exists around them is arguably even more important. Data preparation, feature engineering, model optimization and deployment, take up the majority of data scientists' time.

Kx AutoML automates the entire task of applying machine learning solutions to real-world problems.

### Use Cases for Kx AutoML Include:

- Yield efficiency maximization, fault detection and predictive maintenance in manufacturing processes
- Analysis of data usage for network optimization and outlier detection in telecommunications networks
- Market surveillance, alert detection and classification

Kx enjoys excellent integration with many of the leading auto ML platforms commercially available today. Kx AutoML complements and builds upon these partnerships, placing kdb+ at the core of the framework.

Developed in parallel with kdb+ v4.0, Kx AutoML benefits from multi-threaded analytics to deliver huge performance gains in feature engineering.

### Benefits of AutoML

- Fast prototyping and testing of models
- Optimized for large, structured datasets
- Specific support for time-series data
- Extremely customizable and extensible
- Workflow oversight and report generation
- Saving and deployment of models

### At a Glance

Kx AutoML provides users with the ability to automate the process of applying machine learning techniques to real-world problems

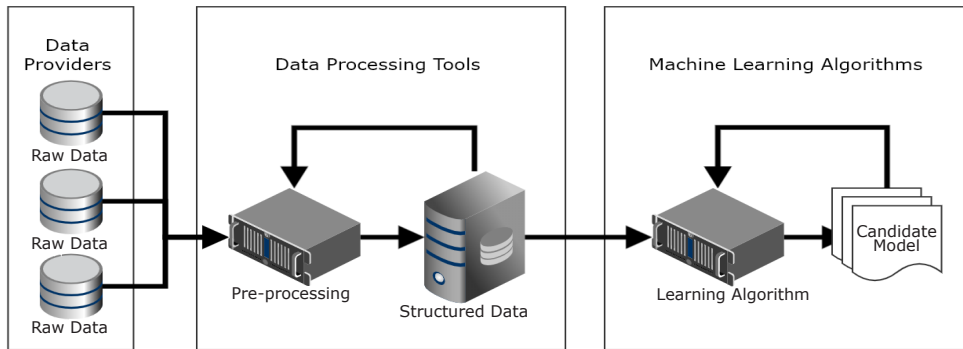
### The Kx Advantage

- Complex Event Processing for real-time data capture and analysis across multiple data sources
- In-memory computing supporting "compute then store" for instant results
- Low latency messaging for high-speed data capture and distribution
- Lambda Architecture/HTAP for combined analysis of real-time and historical data
- In-memory data grid for high-performance, distributed computing
- Optimized for time-series data using columnar storage and built-in temporal data types
- Single Integrated software stack for quicker, easier implementation and lower TCO
- Integrated real-time visualization and enabling self-service Business Intelligence
- Built-in resilience and fault tolerance capabilities



# Automated Machine Learning in kdb+

## Making Machine Learning Easier and Faster with kdb+

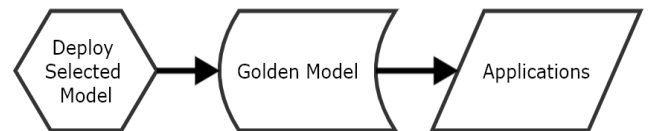


## The Machine Learning Process

The AutoML framework provides a complete machine learning workflow, including pre-processing, feature engineering, model selection/optimization and report generation. It also provides the ability to run previously completed workflows on new data, making use of saved framework information and models.

Extensibility and customization are available in areas such as:

- User-defined feature extraction functions, allowing users to apply their own knowledge to generate bespoke features
- Adding models from the scikit-learn Python library or building new neural network architectures
- Changing the metrics used to score model performance, which will alter how the best model is determined



The optimal model can then be deployed as the Golden Model for a range of on-prem or cloud-based solutions running on kdb+.

AutoML is freely available to all licenced kdb+ users. Further information is provided on [code.kx.com](https://code.kx.com) and [github.com/kxsystems/automl/](https://github.com/kxsystems/automl/) where we welcome community feedback on enhancements, additional features and use cases for future releases.

## About Kx

Kx is a division of First Derivatives, a global technology provider with more than 20 years of experience working with some of the world's largest finance, technology, automotive, utility, manufacturing and energy institutions. Kx technology, incorporating the kdb+ time-series database, is a leader in high-performance, in-memory computing, streaming analytics and operational intelligence. Kx delivers the best possible performance and flexibility for high-volume, data-intensive analytics and applications across multiple industries. The Group operates from 15 offices across Europe, North America and Asia Pacific, including its headquarters in Newry, and employs more than 2,400 people worldwide. For more information about Kx please visit [www.kx.com](http://www.kx.com). For general inquiries, write to [info@kx.com](mailto:info@kx.com). For press inquiries, write to [pr@firstderivatives.com](mailto:pr@firstderivatives.com).

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