Machine Learning Toolkit

Use this document for a quick list of ML search commands as well as some tips on the more widely used algorithms from the Machine Learning Toolkit.

Search Commands for Machine Learning	The Machine Learning Toolkit provides custom search commands for applying machine learning to your data.

Command	Description	Syntax
fit	Fit and apply a machine learning model to search results.	`... | fit algorithm y from x params into model_name as output_field`
apply	Apply a machine learning model that was learned using the fit command.	`... | apply model_name as output_field`
summary	Return a summary of a machine learning model that was learned using the fit command.	`| summary model_name`
listmodels	Return a list of machine learning models that were learned using the fit command.	`| listmodels`
deletemodel	Delete a machine learning model that was learned using the fit command.	`| deletemodel model_name`
sample	Randomly sample or partition events.	`... | sample options by split_by_field`
score	Run statistical tests to validate model outcomes.	`... | score method actual predicted options`

FREQUENTLY USED ALGORITHMS

Anomaly Detection	Find events that contain unusual combinations of values.

Algorithm	Examples
DensityFunction	`... | fit DensityFunction Actual by "HourOfDay,BucketMinuteOfHour,DayOfWeek" into mymodel`
LocalOutlierFactor	`... | fit LocalOutlierFactor * n_neighbors=10 algorithm=kd_tree metric=minkowski p=1 contamination=0.14 leaf_size=10`
OneClassSVM	`... | fit OneClassSVM * kernel=poly nu=0.5 coef0=0.5 gamma=0.5 tol=1 degree=3 shrinking=f into TESTMODEL_OneClassSVM`

Feature Extraction	Feature extraction algorithms transform fields for better prediction accuracy.

Algorithm	Examples
FieldSelector	`... | fit FieldSelector type=categorical SLA_violation from *`
HashingVectorizer	`... | fit HashingVectorizer Logs ngram_range=1-2 k=50 stop_words=english`
ICA	`... | fit ICA m1, m2 n_components=2 as IC`
KernelPCA	`... | fit KernelPCA * k=3 gamma=0.001`
NPR	`... | fit NPR DiskFailure from SerialNumber`
PCA	`... | fita PCA * k=3`
TFIDF	`... | fit TFIDF Reviews into user_feedback_model max_def=0.6 min_def=0.2`

Cluster Numeric	Partition events with multiple numeric fields into clusters.

Algorithm	Examples
Birch	`... | fit Birch * k=3`
DBSCAN	`... | fit DBSCAN * eps=0.9`
KMeans	`... | fit KMeans * k=3`
SpectralClustering	`... | fit SpectralClustering * k=3`
XMeans	`... | fit XMeans *`

Preprocessing	Preprocessing algorithms are used for preparing data and help with prediction accuracy.

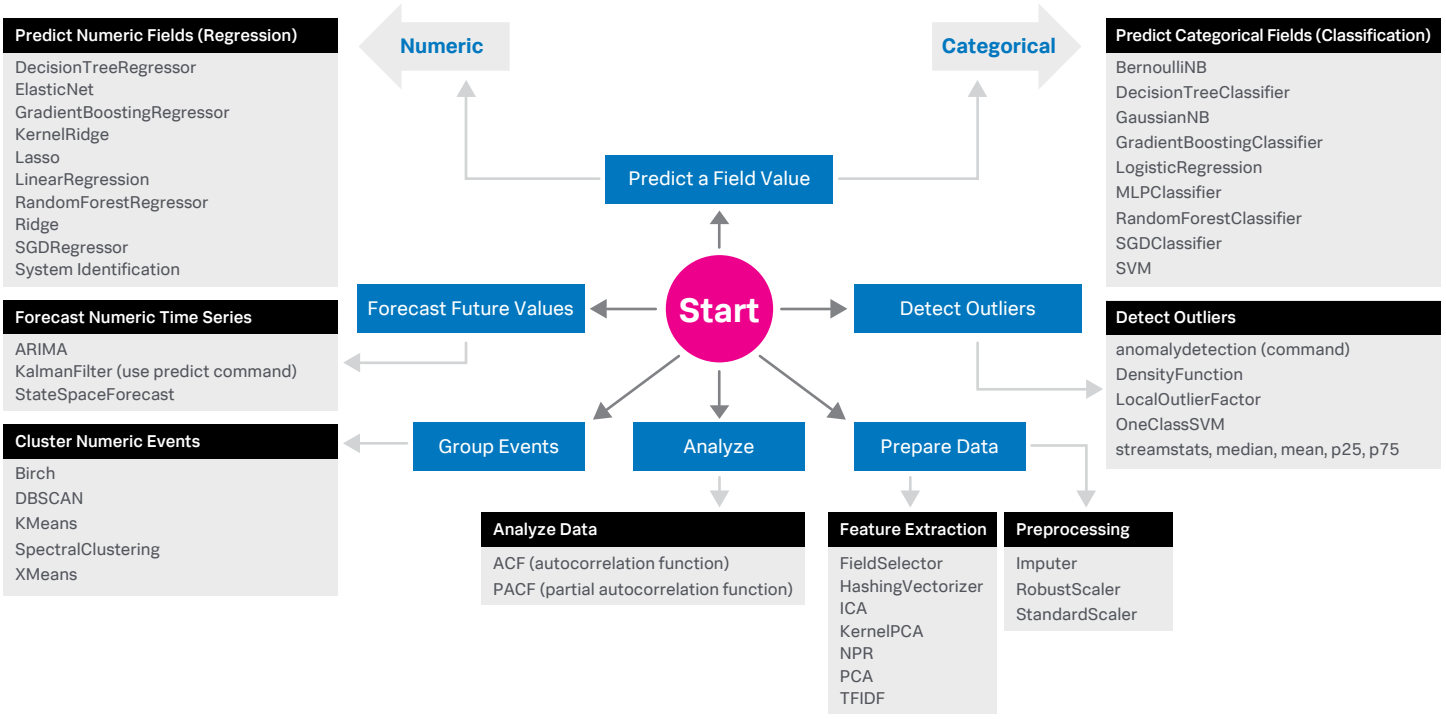
Algorithm	Examples
Imputer	`... | fit Imputer *`
RobustScaler	`... | fit RobustScaler *`
StandardScaler	`... | fit StandardScaler *`

Forecasting	Forecast future values given past values of a metric (numeric time series).

Algorithm	Examples
ARIMA	`... | fit ARIMA Voltage order=4-0-1`
StateSpaceForecast	`... | fit StateSpaceForecast milk_production from * specialdays=holiday into milk_model`

Predict Numeric	Predict the value of a numeric field using the values of other fields in that event.
Algorithm	**Examples**
DecisionTreeRegressor	`... | fit DecisionTreeRegressor temperature from date_month date_hour into temperature_model`
ElasticNet	`... | fit ElasticNet temperature from date_month date_hour normalize=true alpha=0.5 into temperature_model`
GradientBoostingRegressor	`... | fit GradientBoostingRegressor temperature from date_month date_hour into temperature_model`
KernelRidge	`... | fit KernelRidge temperature from date_month date_hour into temperature_model`
Lasso	`... | fit Lasso temperature from date_month date_hour into temperature_model`
LinearRegression	`... | fit LinearRegression temperature from date_month date_hour into temperature_model`
RandomForestRegressor	`... | fit RandomForestRegressor temperature from date_month date_hour into temperature_model`
Ridge	`... | fit Ridge temperature from date_month date_hour normalize=true alpha=0.5 into temperature_model`
SGDRegressor	`... | fit SGDRegressor temperature from date_month date_hour into temperature_model`
System Identification	`... | fit SystemIdentification Expenses from HR1 HR2 ERP dynamics=3-1-2-3 layers=64-64-64`

Predict Categorical	Predict the value of a categorical field using the values of other fields in that event.
Algorithm	**Examples**
BernoulliNB	`... | fit BernoulliNB species from * alpha=0.5 binarize=0 fit prior=f into species_model`
DecisionTreeClassifier	`... | fit DecisionTreeClassifier SLA_violation from * into sla_model`
GaussianNB	`... | fit GaussianNB species from * into species_model`
GradientBoostingClassifier	`... | fit GradientBoostingClassifier species from * into species_model`
LogisticRegression	`... | fit LogisticRegression SLA_violation from IO_wait_time into sla_model`
MLPClassifier	`... | fit MLPClassifier species from * into species_model`
RandomForestClassifier	`... | fit RandomForestClassifier SLA_violation from * into sla_model`
SGDClassifier	`... | fit SGDClassifier SLA_violation from * into sla_model`
SVM	`... | fit SVM SLA_violation from * into sla_model`



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