**executorType**

**executorInstance**

**sourceView**

**executorStorageType**

**algorithmParam**

**sourceTypeParam**

**algorithmImplementation**

**executorStorage**

**algorithmTypeVersion**

**sourceType**

**algorithmType**

**sourceInstance**

**sourceDownload**

**sourceParam**

**sourceSchedule**

**algorithmColumnType**

**sourceParamValue**

**algorithmSchedule**

**algorithmScheduleView**

**algorithmRun**

**sourceViewColumn**

**resourceManagerCheck**

**algorithmOutput**

**algorithmScheduleColumn**

**algorithmScheduleParam**

**algorithmScheduleViewType**

**algorithmTypeColumnType**

**executorHost**

**algorithmParamType**

**algorithmOutputType**

**resourceManagerMeasure**

**sourceViewType**

**executorStorageView**

**executorRestCall**

**resourceManager**

**resourceManagerType**

**executorRest**

**algorithmRunView**

**~~resourceManagerAllocation~~**

**executorStorageSnapshot**

**algorithmRunDownload**

**algorithmRunType**

**algorithmScheduleType**

**sourceDownloadStat**

**sourceDownloadStatColumn**

**algorithmTypeOutputType**

**algorithmStorageSupport**

Starting from running **EXECUTOR** on given **HOST** - that action is adding rows into **executorInstance** and **executorHost** tables.

Each host can run several executors, depending on possibilities and needs. Each executor has type - one of types defined in **executorType** table.

Examples of **EXECUTORs** are: Local, R, Spark, SAS, SSAS. Each **EXECUTOR** has many **ALGORITHMs** to be run on that **EXECUTOR**.

Several **EXECUTORs** can run in one Java **JVM** sharing common **CONTEXT**. For HOST there could be many **STORAGEs** defined in table **executorStorage**.

Each **STORAGE** has type defined in **executorStorageType**. Examples of storage types: LOCAL, HDFS\_CSV, HDFS\_PARQUET, DB, SHARED.

Each **STORAGE** contains downloaded and materialized **VIEWS** from **SOURCE**, each **VIEW** is in table **executorStorageView**.

To define a data, first one should define **SOURCE** - that is in table **sourceIntance**.

Each **SOURCE** has type - one of types in table **sourceType**. Examples of source: JDBC, FTP, SHARED\_FOLDER, WEB\_SERVICE.

To define a source there is a need to define parameters like Connection String, User, Password, Ftp Host, Ftp Port - all parameters are in **sourceParam** table.

Each **SOURCE TYPE** might have different parameters requested to define connection to source, **JDBC** needs: Connection String, User, Password, Driver; **FTP** needs: Ftp Host, Ftp Port, User, Password. Mapping of necessary parameters are in table **sourceTypeParam** - this is **M2M** between **sourceType** and **sourceParam**.

When defining **SOURCE INSTANCE** - user is defining values for all requested parameters. **SOURCE INSTANCE** is in table **sourceInstance**.

All parameters for given **SOURCE INSTANCE** are in table **sourceParamValue**.

Each **SOURCE INSTANCE** can have many **VIEWS** - structures with defined schema available to download to **STORAGE**. For **JDBC** is it a list of tables/views. For **FTP** it is list of folders/files. Views are filled on request while connecting to **SOURCE INSTANCE** and are stored in table: **sourceView**. Views might be versioned.

Each **SOURCE VIEW** has many columns stored in table **sourceViewColumn**.

Each **SOURCE VIEW** has type - it is one of type defined in **sourceViewType** table: TABLE, VIEW, FILE, SQL, FOLDER, WEB\_METHOD.

**SOURCE VIEW** could be scheduled to be downloaded, schedule can be periodic or on request (once). Definition of downloading **SOURCE VIEW** is in table **sourceSchedule**.

When downlading **SOURCE VIEW** into **executorStorageView** object, **sourceDownload** is created to check progress.

All ML algorithms are splitted into several **ALGORITHM TYPEs** defined in table **algorithmType**. Examples are: Prediction, Classification, Clustering, Market Basket. All ML algorithms for given type have the same type of inputs and outputs, but different implementations (R, SAS, Spark ML, ...).

All parameters for algorithms are in **algorithmParam** table. Sample parameters are: Alpha, Minimum Confidence, Time Series Periods.

All columns needed for algorithm are in **algorithmColumnType** table. Sample columns are: TimeMonths, Value, Group, Predicted, Input.

Mappings between **ALGORITHM VERSION** and **ALGORITHM PARAMETER** are in **algorithmParamType** table.

Mappings between **ALGORITHM VERSION** and **ALGORTHM COLUMN** are in **algorithmTypeColumnType** table.

Algorithm types are versioned creating **ALGORITHM VERSION**, it means we can run Prediction v1.0 or Prediction v1.2. All versions are in table: **algorithmTypeVersion**. The reason of versioning is to keep backward compatibility even with changing/extending algorithm types by new columns/parameters. So, it could be possibility of use new version (upgrade) after adding all new required columns and parameters.

All implementations for all algorithms are in table **algorithmImplementation**. Each implementation is written exactly for one **EXECUTOR TYPE**. For example **LocalPredictionSpark** implementation is for **SPARK** executor type, **PredictionTimeSeriesR** is for **R** executor type.

To run any implementation of algorithm, **ALGORITHM SCHEDULE** must be defined in table **algorithmSchedule**.

For given **ALGORITHM SCHEDULE** input **ALGORITHM PARAMETERs** should be set in table **algorithmScheduleParam**. That table contains value for all parameters to run algorithm.

For given **ALGORITHM SCHEDULE** input **VIEWS** should be selected in table **algorithmScheduleView**.

For given **algorithmScheduleView** user can define type - one of type in table **algorithmScheduleViewType**, sample types: TRAINING, TESTING, VALIDATION, INPUT.

Each **ALGORITHM SCHEDULE** could be took by **EXECUTOR** and run creating **ALGORITHM RUN** object in table **algorithmRun**.

For given **ALGORITHM RUN** all views are collected in table **algorithmRunView**.

Each **ALGORITHM RUN** is creating many outputs **ALGORITHM OUTPUT** in table **algorithmOutput**.

Each **ALGORITHM OUTPUT** is a file in **STORAGE**.

**executorType**

**executorInstance**

**executorHost**

**executorRest**

**executorRestCall**

**executorType**

**executorInstance**

**resourceManagerCheck**

**executorHost**

**resourceManagerMeasure**

**resourceManager**

**resourceManagerType**

**resourceManagerAllocation**

**executorType**

**executorInstance**

**sourceView**

**executorStorageType**

**algorithmParam**

**sourceTypeParam**

**algorithmImplementation**

**executorStorage**

**algorithmTypeVersion**

**sourceType**

**algorithmType**

**sourceInstance**

**sourceDownload**

**sourceParam**

**sourceSchedule**

**algorithmColumnType**

**sourceParamValue**

**algorithmSchedule**

**algorithmScheduleView**

**algorithmRun**

**sourceViewColumn**

**resourceManagerCheck**

**algorithmOutput**

**algorithmScheduleColumn**

**algorithmScheduleParam**

**algorithmScheduleViewType**

**algorithmTypeColumnType**

**executorHost**

**algorithmParamType**

**algorithmOutputType**

**resourceManagerMeasure**

**sourceViewType**

**executorStorageView**

**executorRestCall**

**resourceManager**

**resourceManagerType**

**executorRest**

**algorithmRunView**

**~~resourceManagerAllocation~~**

**executorStorageSnapshot**

**algorithmRunDownload**

**algorithmRunType**

**algorithmScheduleType**

**sourceDownloadStat**

**sourceDownloadStatColumn**

**algorithmTypeOutputType**