
AIMMS Function Reference - Language Related Identifiers

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Language Related Identifiers

The following collection of predefined identifiers define various sets containing similar keywords from the AIMMS language. These sets are mostly used for the specification of accurate prototypes of built-in AIMMS functions.

- `AggregationTypes`
- `AllAttributeNames`
- `AllBasicValues`
- `AllCaseComparisonModes`
- `AllColumnTypes`
- `AllDifferencingModes`
- `AllExecutionStatuses`
- `AllGMPExtensions`
- `AllIdentifierTypes`
- `AllIsolationLevels`
- `AllMathematicalProgrammingTypes`
- `AllMatrixManipulationDirections`
- `AllMatrixManipulationProgrammingTypes`
- `AllRowTypes`
- `AllSolutionStates`
- `AllSolverInterrupts`
- `AllSuffixNames`
- `AllValueKeywords`
- `AllViolationTypes`
- `ContinueAbort`
- `DiskWindowVoid`
- `Integers`
- `MaximizingMinimizing`
- `MergeReplace`
- `OnOff`
- `TimeSlotCharacteristics`
- `YesNo`

AggregationTypes

The predefined set `AggregationTypes` contains the collection of all possible aggregation types supported by the `Aggregate` and `DisAggregate` functions.

```
SET:
  identifier : AggregationTypes
  index      : IndexAggregationTypes
  definition : data { summation, average,
                    maximum, minimum,
                    interpolation } ;
```

Definition:

The set `AggregationTypes` contains the collection of all possible aggregation types supported by the `Aggregate` and `DisAggregate` functions.

Updatability:

The contents of the set cannot be modified.

Remarks:

Element parameters into `AggregationTypes` can be used as the *type* argument of the `Aggregate` and `DisAggregate` functions.

See also:

The functions `Aggregate` and `DisAggregate`. Time-dependent aggregation and disaggregation is discussed in full detail in Section 31.5 of the Language Reference.

AllAttributeNames

The predefined set AllAttributeNames contains the names of all possible identifier attributes.

```
SET:
  identifier : AllAttributeNames
  index      : IndexAttributeNames ;
```

Definition:

The predefined set AllAttributeNames contains the names of all possible identifier attributes.

Updatability:

The contents of the set cannot be modified.

Remarks:

The set AllAttributeNames will, in general, be of little use in most AIMMS models.

See also:

The sets [AllIdentifierTypes](#), [AllSuffixNames](#).

AllBasicValues

The predefined set AllBasicValues contains the names of all basic values available in AIMMS.

```
SET:
  identifier : AllBasicValues
  index      : IndexBasicValues
  definition : data { NonBasic, Basic, SuperBasic } ;
```

Definition:

The set AllBasicValues contains the names of all basic values in AIMMS.

Updatability:

The contents of the set cannot be modified.

AllCaseComparisonModes

The predefined set AllCaseComparisonModes contains the collection of all possible modes supported by the `CaseCompareIdentifier` function.

```
SET:
  identifier : AllCaseComparisonModes
  index      : IndexCaseComparisonModes
  definition : data { min, max, sum
                    average, count } ;
```

Definition:

The predefined set AllCaseComparisonModes contains the collection of all possible modes supported by the `CaseCompareIdentifier` function.

Updatability:

The contents of the set cannot be modified.

Remarks:

Element parameters into AllCaseComparisonModes can be used as the *mode* argument of the `CaseCompareIdentifier` function.

See also:

The function `CaseCompareIdentifier`.

AllColumnTypes

The predefined set `AllColumnTypes` contains the names of all column types available in the matrix manipulation library of AIMMS.

```
SET:
  identifier : AllColumnTypes
  index      : IndexColumnTypes
  definition : data { integer, continuous } ;
```

Definition:

The set `AllColumnTypes` contains the names of all column types available in the matrix manipulation library of AIMMS.

Updatability:

The contents of the set cannot be modified.

Remarks:

Element parameters into `AllColumnTypes` can be used as the *type* argument of the `GMP::Column::SetType` function.

See also:

The function `GMP::Column::SetType`. Matrix manipulation is discussed in more detail in Chapter 21 of the Language Reference.

AllDataColumnCharacteristics

The predefined set AllDataColumnCharacteristics contains all possible column properties, which can be queried using the function [SQLColumnData](#).

```
SET:
  identifier : AllDataColumnCharacteristics
  index      : IndexDataColumnCharacteristics
  definition : data { Name, DataType, Width,
                    NumberOfDecimals, IsPrimaryKey,
                    Nullable, DefaultValue, Remark } ;
```

Definition:

The set AllDataColumnCharacteristics contains all possible column properties, which can be queried using the function [SQLColumnData](#). They are:

- Name : The name of the column.
- DataType : The data type of the column.
- Width : The column width.
- NumberOfDecimals : The number of decimals of the column. Only applicable for numeric columns.
- IsPrimaryKey : Specifies whether the column is part of the primary key for the database table. Returns "Yes" or "No".
- Nullable : Specifies whether the column is nullable or not. Returns "Yes" or "No".
- DefaultValue : The default value of the column.
- Remark : The remark associated with the column.

Updatability:

The contents of the set cannot be modified.

See also:

The function [SQLColumnData](#).

AllDataSourceProperties

The predefined set `AllDataSourceProperties` contains all datasource properties, which can be queried using the function `GetDataSourceProperty`.

```
SET:
  identifier : AllDataSourceProperties
  index      : IndexDataSourceProperties
  definition : data { SQL_DATA_SOURCE_NAME, SQL_DATA_SOURCE_READ_ONLY,
                    SQL_DBMS_NAME, SQL_DBMS_VER, SQL_DRIVER_NAME,
                    SQL_DM_VER, SQL_DRIVER_VER, SQL_KEYWORDS,
                    SQL_SERVER_NAME } ;
```

Definition:

The set `AllDataSourceProperties` contains all datasource properties, which can be queried using the function `GetDataSourceProperty`. They are:

- `SQL_DATA_SOURCE_NAME` : The name of the datasource.
- `SQL_DATA_SOURCE_READ_ONLY` : The read-only status of the datasource. Returns "Yes" or "No".
- `SQL_DBMS_NAME` : The name of the database system (e.g., returns "Oracle" for an Oracle database).
- `SQL_DBMS_VER` : The version of the database system.
- `SQL_DRIVER_NAME` : The actual DLL of the ODBC/OLE DB driver for the datasource.
- `SQL_DM_VER` : The version of the ODBC driver manager.
- `SQL_DRIVER_VER` : The version of the ODBC/OLE DB driver for the datasource.
- `SQL_KEYWORDS` : A comma-separated list of all reserved keywords of the datasource.
- `SQL_SERVER_NAME` : The datasource-specific server name.

Updatability:

The contents of the set cannot be modified.

See also:

The function [GetDataSourceProperty](#).

AllDifferencingModes

The predefined set AllDifferencingModes contains the collection of all possible differencing modes supported by the [CaseCreateDifferenceFile](#) function.

```
SET:
  identifier : AllDifferencingModes
  index      : IndexDifferencingModes
  definition : data { blockReplacement, elementReplacement,
                    elementAddition, elementMultiplication } ;
```

Definition:

The predefined set AllDifferencingModes contains the collection of all possible differencing modes supported by the [CaseCreateDifferenceFile](#) function:

- **blockReplacement:** When there are differences between the reference case and the current case for an identifier the data of that identifier in the current case is entirely displayed.
- **elementReplacement:** When there are differences between the reference case and the current case for an identifier the differing elements in the current case are displayed. This may include defaults for elements deleted.
- **elementAddition:** When there are differences between the reference case and the current case for an identifier the differences between elements in the current case and reference case are displayed.
- **elementMultiplication:** When there are differences between the reference case and the current case for an identifier the relative differences between elements in the current case and reference case are displayed.

Updatability:

The contents of the set cannot be modified.

Remarks:

Element parameters into AllDifferencingModes can be used as the *diffTypes* argument of the [CaseCreateDifferenceFile](#) function.

See also:

The function [CaseCreateDifferenceFile](#).

AllExecutionStatuses

The predefined set `AllExecutionStatuses` contains the names of all execution statuses associated with asynchronous solves.

```
SET:  
  identifier : AllExecutionStatuses  
  index      : IndexExecutionStatus ;
```

Definition:

The set `AllExecutionStatuses` contains the names of all execution statuses associated with asynchronous solves. The execution status of an asynchronous solve can be queried using the function `GMP::SolverSession::ExecutionStatus`.

See also:

The function `GMP::SolverSession::ExecutionStatus`.

AllGMPExtensions

The predefined set AllGMPExtensions contains the collection of all possible extensions in the matrix manipulation library of AIMMS.

```
SET:
  identifier : AllGMPExtensions
  index      : IndexGMPExtensions
  definition : data { DualObjective, DualDefinition,
                    DualLowerBound, DualUpperBound } ;
```

Definition:

The predefined set AllGMPExtensions contains the collection of all possible extensions in the matrix manipulation library of AIMMS.

Updatability:

The contents of the set cannot be modified.

Remarks:

Together with the suffices .ExtendedConstraint and .ExtendedVariable, element parameters into AllGMPExtensions can be used as the extension argument of a constraint, a variable, and a mathematical program.

See also:

The set [AllSuffixNames](#). Matrix manipulation is discussed in more detail in Chapter [21](#) of the Language Reference.

AllIdentifierTypes

The predefined set AllIdentifierTypes contains the names of all possible identifier types.

```
SET:
  identifier : AllIdentifierTypes
  index      : IndexIdentifierTypes ;
```

Definition:

The predefined set AllIdentifierTypes contains the names of all possible identifier types.

Updatability:

The contents of the set cannot be modified.

Remarks:

The set AllIdentifierTypes will, in general, be of little use in most AIMMS models.

See also:

The sets [AllAttributeNames](#), [AllSuffixNames](#).

AllIsolationLevels

The predefined set `AllIsolationLevels` contains the supported isolation levels for a database transaction, as started through the procedure `StartTransaction`.

```
SET:
  identifier : AllIsolationLevels
  index      : IndexIsolationLevels
  definition : data { ReadUncommitted, ReadCommitted,
                    RepeatableRead, Serializable } ;
```

Definition:

The predefined set `AllIsolationLevels` contains the supported isolation levels for a database transaction. They are:

- `ReadUncommitted`: a transaction operating at this level can see uncommitted changes made by other transactions,
- `ReadCommitted` (default): a transaction operating at this level cannot see changes made by other transactions until those transactions are committed,
- `RepeatableRead`: a transaction operating at this level is guaranteed not to see any changes made by other transactions in values it has already read during the transaction, and
- `Serializable`: a transaction operating at this level guarantees that all concurrent transactions interact only in ways that produce the same effect as if each transaction were entirely executed one after the other.

Updatability:

The contents of the set cannot be modified.

Remarks:

Not all database servers may support all of these isolation levels, and may cause the call to `StartTransaction` to fail.

See also:

The function `StartTransaction`.

AllMathematicalProgrammingTypes

The predefined set `AllMathematicalProgrammingTypes` contains the list of mathematical programming types supported by AIMMS.

```
SET:
  identifier : AllMathematicalProgrammingTypes
  subset of  : AllValueKeywords
  index      : IndexMathematicalProgrammingTypes ;
```

Definition:

The set `AllMathematicalProgrammingTypes` contains the list of mathematical programming types supported by AIMMS.

Updatability:

The contents of the set `AllMathematicalProgrammingTypes` is completely under the control of AIMMS, and cannot be modified.

Remarks:

Element parameters into the set `AllMathematicalProgrammingTypes` can be used in the declaration of mathematical programs or as part of the `SOLVE` statement to dynamically modify the type of a mathematical program. The predefined identifier `CurrentSolver` defines the active solver for each mathematical programming type.

See also:

The set `AllValueKeywords`, `CurrentSolver`. Mathematical programs are discussed in full detail in Section 15.1 of the Language Reference, the `SOLVE` statement in Section 15.3.

AllMatrixManipulationDirections

The predefined set AllMatrixManipulationDirections contains the list of optimization directions supported by the matrix manipulation library of AIMMS.

```
SET:
  identifier : AllMatrixManipulationDirections
  subset of  : AllValueKeywords
  index      : IndexMatrixManipulationDirections ;
```

Definition:

The set AllMatrixManipulationDirections contains the list of optimization directions supported by the matrix manipulation library of AIMMS.

Updatability:

The contents of the set AllMatrixManipulationDirections is completely under the control of AIMMS, and cannot be modified.

Remarks:

Element parameters into the set AllMatrixManipulationDirections can be used as the *direction* argument of the `GMP::Instance::SetDirection` function.

See also:

The set `AllValueKeywords`, the function `GMP::Instance::SetDirection`. Matrix manipulation is discussed in more detail in Chapter 21 of the Language Reference.

AllMatrixManipulationProgrammingTypes

The predefined set `AllMatrixManipulationProgrammingTypes` contains the collection of mathematical programming types that can be used in conjunction with the matrix manipulation library of AIMMS.

```
SET:
  identifier : AllMatrixManipulationProgrammingTypes
  subset of  : AllMathematicalProgrammingTypes
  index      : IndexMatrixManipulationProgrammingTypes ;
```

Definition:

The predefined set `AllMatrixManipulationProgrammingTypes` contains the collection of mathematical programming types that can be used in conjunction with the matrix manipulation library of AIMMS.

Updatability:

The contents of the set `AllMatrixManipulationProgrammingTypes` is completely under the control of AIMMS, and cannot be modified.

Remarks:

Element parameters into the set `AllMatrixManipulationDirections` can be used as the *type* argument of the `GMP::Instance::SetMathematicalProgrammingType` function.

See also:

The set `AllMathematicalProgrammingTypes`, the function `GMP::Instance::SetMathematicalProgrammingType`. Matrix manipulation is discussed in more detail in Chapter 21 of the Language Reference.

AllRowTypes

The predefined set `AllRowTypes` contains the collection of all possible row types available in the matrix manipulation library of AIMMS.

```
SET:
  identifier : AllRowTypes
  index      : IndexRowTypes
  definition : data { '<=', '=', '>=', ranged } ;
```

Definition:

The set `AllRowTypes` contains the collection of all possible row types available in the matrix manipulation library of AIMMS.

Updatability:

The contents of the set cannot be modified.

Remarks:

Element parameters into `AllRowTypes` can be used as the *type* argument of the `GMP::Row::SetType` function.

See also:

The function `GMP::Row::SetType`. Matrix manipulation is discussed in more detail in Chapter 21 of the Language Reference.

AllSolutionStates

The predefined set AllSolutionStates contains the names of possible values of the program and solver status of a mathematical program.

```
SET:
  identifier : AllSolutionStates
  index      : IndexSolutionStates ;
```

Definition:

The set AllSolutionStates contains the names of all possible values of the ProgramStatus and SolverStatus suffices of a mathematical program.

Updatability:

The contents of the set cannot be modified.

Remarks:

The suffices ProgramStatus and SolverStatus of a mathematical program take their values in the set AllSolutionStates.

See also:

The program status and solver status are discussed in more detail in Section [15.2](#) of the Language Reference.

AllSolverInterrupts

The predefined set AllSolverInterrupts contains the names of all causes for a callback.

```
SET:
  identifier : AllSolverInterrupts
  index      : IndexSolverInterrupts
  definition :
    data { NewIncumbent, AddCut, Iterations,
           StatusChange, Finished } ;
```

Definition:

The set AllSolverInterrupts contains the names of all causes for a callback.

Updatability:

The contents of the set cannot be modified.

Remarks:

If you have installed the same callback procedure for several callbacks, you can call the function `GMP::SolverSession::GetCallbackInterruptStatus`, which returns an element into the set AllSolverInterrupts, to obtain the particular callback for which your callback procedure was called.

See also:

The sets `GMP::Instance::SetCallbackAddCut`, `GMP::Instance::SetCallbackNewIncumbent`, `GMP::Instance::SetCallbackIterations`, `GMP::Instance::SetCallbackStatusChange`, `GMP::SolverSession::GetCallbackInterruptStatus`.

AllSuffixNames

The predefined set AllSuffixNames contains the names of all existing suffices of all identifier types.

```
SET:
  identifier : AllSuffixNames
  index      : IndexSuffixNames ;
```

Definition:

The set AllSuffixNames contains the names of all possible suffices for the entire collection of identifier types.

Updatability:

The contents of the set cannot be modified.

Remarks:

The set AllSuffixNames will, in general, be of little use in most AIMMS models.

See also:

The sets [AllIdentifierTypes](#), [AllAttributeNames](#).

AllValueKeywords

The predefined set AllValueKeywords serves as the root set of various other predefined sets containing AIMMS keywords.

```
SET:
  identifier : AllValueKeywords
  index      : IndexValueKeywords
  definition : AllMathematicalProgrammingTypes +
               AllMatrixManipulationDirections +
               AllViolationTypes + YesNo +
               ContinueAbort + MergeReplace + OnOff +
               DiskWindowVoid + MaximizingMinimizing ;
```

Definition:

The set AllValueKeywords contains keywords used in various other predefined sets containing AIMMS keywords.

Updatability:

The contents of the set AllValueKeywords is completely under the control of AIMMS, and cannot be modified.

Remarks:

The set AllValueKeywords is, in general, of little direct use in an AIMMS application.

See also:

The sets [AllMathematicalProgrammingTypes](#), [AllMatrixManipulationDirections](#), [AllViolationTypes](#), [YesNo](#), [ContinueAbort](#), [DiskWindowVoid](#), [MaximizingMinimizing](#), [MergeReplace](#), [OnOff](#).

AllViolationTypes

The predefined set `AllViolationTypes` contains the collection of all violation types for which violation penalties can be specified in a mathematical program declaration.

```
SET:
  identifier : AllViolationTypes
  subset of  : AllValueKeywords
  index      : IndexViolationTypes
  definition : data { Lower, Upper, Definition } ;
```

Definition:

The set `AllViolationTypes` contains the violation types for which violation penalties can be specified in a mathematical program declaration.

Updatability:

The contents of the set `AllViolationTypes` is completely under the control of AIMMS, and cannot be modified.

Remarks:

The set `AllViolationTypes` is typically used in the index domain of identifiers specified in the `VIOLATION PENALTIES` attribute of a `MATHEMATICAL PROGRAM`.

See also:

The sets `AllMathematicalProgrammingTypes`, `AllMatrixManipulationDirections`, `ContinueAbort`, `DiskWindowVoid`, `MaximizingMinimizing`, `MergeReplace`, `OnOff`. The `VIOLATION PENALTIES` attribute of a mathematical programs is discussed in Section 15.4 of the Language Reference.

ContinueAbort

The predefined set `ContinueAbort` defines the set of possible return statuses of solver callback procedures.

```
SET:
  identifier : ContinueAbort
  subset of  : AllValueKeywords
  index     : IndexContinueAbort
  definition : data { continue, abort } ;
```

Definition:

The set `ContinueAbort` defines the set of possible return statuses of solver callback procedures.

Updatability:

The contents of the set cannot be modified.

Remarks:

The elements of the set `ContinueAbort` can be assigned to the `CallbackReturnStatus` suffix of a mathematical program upon return of a solver callback procedure.

See also:

The set [AllValueKeywords](#). Solver callback procedures are discussed in [Section 15.2](#) of the Language Reference.

DiskWindowVoid

The predefined set `DiskWindowVoid` defines the set of possible devices of file identifiers.

```
SET:
  identifier : DiskWindowVoid
  subset of  : AllValueKeywords
  index      : IndexDiskWindowVoid
  definition : data { disk, Disk(ASCII), Disk(Unicode),
                    window, void };
```

Definition:

The predefined set `DiskWindowVoid` defines the set of possible devices which can be entered in the `DEVICE` attribute of a `FILE` identifier.

Updatability:

The contents of the set cannot be modified.

Remarks:

Element parameters into the set `DiskWindowVoid` can be entered in the `DEVICE` attribute of `FILE` identifiers to allow dynamic device changes for a file.

See also:

The set [AllValueKeywords](#). File identifiers are discussed in Section [29.1](#) of the Language Reference.

Integers

The predefined set Integers defines the range of allowed integer set elements in AIMMS.

```
SET:
  identifier : Integers
  index      : IndexIntegers
  definition : { (-2^30+5) .. (2^30+2) } ;
```

Definition:

The set Integers defines the range of integers that can possibly serve as integer set elements in AIMMS.

Updatability:

The contents of the set cannot be modified.

Remarks:

Subsets of the sets Integers are frequently used to enumerate objects within a model. Datafiles (i.e. cases and datasets) in AIMMS are enumerated as subsets of the set Integers.

See also:

The sets [AllDataFiles](#), [AllCases](#), [AllDataSets](#). Integer sets are discussed in Section [3.2.2](#) of the Language Reference.

MaximizingMinimizing

The predefined set `MaximizingMinimizing` defines the set of possible optimization directions of mathematical programs.

```
SET:
  identifier : MaximizingMinimizing
  subset of  : AllValueKeywords
  index     : IndexMaximizingMinimizing
  definition : data { maximize, minimize } ;
```

Definition:

The predefined set `MaximizingMinimizing` defines the set of possible optimization directions that can be entered in the `DIRECTION` attribute of mathematical programs.

Updatability:

The contents of the set cannot be modified.

Remarks:

Element parameters into the set `MaximizingMinimizing` can be entered in the `DIRECTION` attribute of mathematical programs to allow dynamic choices of the optimization direction.

See also:

The set `AllValueKeywords`. Mathematical programs are discussed in more detail in Section 15.1 of the Language Reference.

MergeReplace

The predefined set MergeReplace defines the set of modes for the READ, WRITE and SOLVE statements.

```
SET:
  identifier : MergeReplace
  subset of  : AllValueKeywords
  index      : IndexMergeReplace
  definition : data { merge, replace } ;
```

Definition:

The predefined set MergeReplace defines the set of modes for the READ, WRITE and SOLVE statements as specified through the IN MERGE/REPLACE MODE clause.

Updatability:

The contents of the set MergeReplace cannot be modified.

Remarks:

Element parameters into the set MergeReplace can be used to dynamically indicate the mode of a READ, WRITE or SOLVE statement.

See also:

The set [AllValueKeywords](#). The SOLVE statement is discussed in Section [15.3](#) of the Language Reference, the READ and WRITE statements in Section [24.2](#).

OnOff

The predefined set `OnOff` defines the set of possibilities the `PageMode` suffix of `FILE` identifiers.

```
SET:
  identifier : OnOff
  subset of  : AllValueKeywords
  index      : IndexOnOff
  definition : data { on, off } ;
```

Definition:

The set `OnOff` defines the set of possibilities the `PageMode` suffix of `FILE` identifiers.

Updatability:

The contents of the set `OnOff` cannot be modified.

Remarks:

Element parameters into the set `OnOff` assigned to be `PageMode` suffix of a `FILE` identifier can be used to dynamically change the page mode of a file.

See also:

The set [AllValueKeywords](#). The `PageMode` suffix of `FILE` identifiers is discussed in full detail in [Section 29.4](#).

TimeSlotCharacteristics

The predefined set `TimeSlotCharacteristics` contains the collection of timeslot characteristic which can be used in conjunction with the function `TimeSlotCharacteristic`.

```
SET:
  identifier : TimeSlotCharacteristics
  index      : IndexTimeSlotCharacteristics
  definition : data { century, year, quarter, month
                    weekday, yearday, monthday
                    week, weekyear, weekcentury
                    hour, minute, second, tick } ;
```

Definition:

The set `TimeSlotCharacteristics` contains the collection of timeslot characteristic which can be used in conjunction with the function `TimeSlotCharacteristic`.

Updatability:

The contents of the set cannot be modified.

Remarks:

Element parameters into `TimeSlotCharacteristics` can be used as the *characteristic* argument of the `TimeSlotCharacteristic` function.

See also:

The function `TimeSlotCharacteristic`. The use of the function `TimeSlotCharacteristic` is explained in more detail in Section 31.4 of the Language Reference.

YesNo

The predefined set YesNo defines the set of elements Yes and No.

```
SET:
  identifier : YesNo
  subset of  : AllValueKeywords
  index      : IndexYesNo
  definition : data { yes, no } ;
```

Definition:

The predefined set YesNo defines the set of elements Yes and No.

Updatability:

The contents of the set YesNo cannot be modified.

Remarks:

The set YesNo is not used by AIMMS anymore.

See also:

The set [AllValueKeywords](#).