
AIMMS Function Reference - Variable Suffices

This file contains only one chapter of the book. For a free download of the complete book in pdf format, please visit www.aimms.com

Variable Suffices

AIMMS variables support the following collection of suffices.

- `.ReducedCost`
- `.Nonvar`
- `.Relax`
- `.Complement`
- `.DefinitionViolation`
- `.Derivative`
- `.Priority`
- `.SmallestCoefficient`
- `.NominalCoefficient`
- `.LargestCoefficient`
- `.SmallestValue`
- `.LargestValue`

.ReducedCost**Definition:**

When the property `ReducedCost` of a variable is set or when the option `Always store marginals` is set to on, the `.ReducedCost` suffix contains the reduced cost of that variable.

Datatype:

The value of the `.ReducedCost` suffix is numeric.

Dimension:

The `.ReducedCost` suffix has the same dimension and domain as that of the constraint at hand.

Remarks:

- The GAMS equivalent suffix name is `.m`.
- The default of the option `Always store marginals` is off.
- See also Section [14.1](#) of the Language Reference.

.Nonvar

Definition:

The .Nonvar suffix controls whether individual variables are frozen or not. This suffix can take on three values:

- 0 This variable is not frozen and a value for the variable should be found in the next solve statement.
- 1 This variable is frozen and it will retain its value during the SOLVE statement. The corresponding column will be removed from the generated mathematical program for the sake of efficiency.
- 1 This variable is frozen and it will retain its value during the SOLVE statement. The corresponding column will *not* be removed from the generated mathematical program but can be manipulated during subsequent calls of the GMP function library.

Datatype:

The value of the .Nonvar suffix is an integer in the range $\{-1, 0, 1\}$ and the default is 0.

Dimension:

The .Nonvar suffix has the same dimension and domain as that of the constraint or variable at hand.

Remarks:

- When the .lower suffix of a variable is equal to the .upper suffix of the same variable that variable is treated as a frozen variable and subsequently removed from the generated mathematical program independently from the setting of the .nonvar suffix.
- See also Section 14.1 of the Language Reference.
- The AIMMS 2 equivalent suffix name is .freeze.
- The .NonVar suffix should not be confused with the GAMS suffix .fx. This latter suffix is a shorthand for the GAMS suffices .l, .lo and .up.

.Relax**Definition:**

The variable suffix `.Relax` controls whether the integer variable at hand is relaxed to a continuous range or not. This suffix can take on two values:

- 0 This variable is not relaxed and its restriction to take on only integral values is passed on to the solver.
- 1 This variable is relaxed to the continuous range directly encompassing its original integral range.

Datatype:

The value of the `.Relax` suffix is an integer in the range $\{0,1\}$ and the default is 0.

Dimension:

The `.Relax` suffix has the same dimension and domain as that of the constraint or variable at hand.

Remarks:

- See also Section [14.1](#) of the Language Reference.

.Complement

Definition:

The variable suffix `.Complement` contains the level value of the complementarity constraint after solving a complementarity problem.

Datatype:

The value of the `.Complement` suffix is numeric.

Dimension:

The `.Complement` suffix has the same dimension and domain as that of the variable at hand.

Remarks:

- The `Complement` suffix is only applicable for complementarity variables.
- See also Section [18.1](#) of the Language Reference.

.DefinitionViolation**Definition:**

The variable suffix `.DefinitionViolation` contains the amount by which the defining constraint of that variable is violated when conducting an infeasibility analysis.

Datatype:

The value of the `.DefinitionViolation` suffix is numeric.

Dimension:

The `.DefinitionViolation` suffix has the same dimension and domain as that of the variable at hand.

Remarks:

- See also section [15.4](#) of the Language Reference.

.Derivative

Definition:

The variable suffix `.Derivative` contains the derivative values of a variable used in an external function which is again used inside a constraint. The `.Derivative` suffix is only applicable inside the `derivative call` attribute of external functions.

Datatype:

The value of the `.Derivative` suffix is numeric.

Dimension:

The dimension of the suffix `.Derivative` is the dimension of the external function plus the dimension of the variable. The domain of the suffix `.Derivative` is the domain of the external function followed by the domain of the variable.

Remarks:

- See also section [11.4.1](#) of the Language Reference.

.Priority**Definition:**

The variable suffix `.Priority` controls branching priority in the branch and bound solution process.

Datatype:

The value of the `.Priority` suffix is numeric.

Dimension:

The `.Priority` suffix has the same dimension and domain as that of the constraint or variable at hand.

Remarks:

- See also Section [14.1](#) of the Language Reference.
- The GAMS equivalent suffix name is `.prior`.

.SmallestCoefficient**Definition:**

When the property `CoefficientRange` of a variable is set and the option `Calculate Sensitivity Ranges` is not set to off a coefficient range sensitivity analysis is conducted such that the optimal basis remains constant. As a result of this analysis the variable suffix `.SmallestCoefficient` contains the smallest objective coefficient value.

Datatype:

The value of the `.SmallestCoefficient` suffix is numeric.

Dimension:

The `.SmallestCoefficient` suffix has the same dimension and domain as that of the variable at hand.

Remarks:

- The default of the option `Calculate Sensitivity Ranges` is on.
- See also Section [14.1](#) of the Language Reference.

.NominalCoefficient**Definition:**

When the property `CoefficientRange` of a variable is set and the option `Calculate Sensitivity Ranges` is not set to `off` a coefficient range sensitivity analysis is conducted such that the optimal basis remains constant. As a result of this analysis the variable suffix `.NominalCoefficient` contains the nominal objective coefficient value.

Datatype:

The value of the `.NominalCoefficient` suffix is numeric.

Dimension:

The `.NominalCoefficient` suffix has the same dimension and domain as that of the variable at hand.

Remarks:

- The default of the option `Calculate Sensitivity Ranges` is `on`.
- See also Section [14.1](#) of the Language Reference.

.LargestCoefficient

Definition:

When the property `CoefficientRange` of a variable is set and the option `Calculate Sensitivity Ranges` is not set to off a coefficient range sensitivity analysis is conducted such that the optimal basis remains constant. As a result of this analysis the variable suffix `.LargestCoefficient` contains the largest objective coefficient value.

Datatype:

The value of the `.LargestCoefficient` suffix is numeric.

Dimension:

The `.LargestCoefficient` suffix has the same dimension and domain as that of the variable at hand.

Remarks:

- The default of the option `Calculate Sensitivity Ranges` is on.
- See also Section [14.1](#) of the Language Reference.

.SmallestValue

Definition:

When the property `ValueRange` of a variable is set and the option `Calculate Sensitivity Ranges` is not set to off a value range sensitivity analysis is conducted such that the objective value remains constant. As a result of this analysis the variable suffix `.SmallestValue` contains the smallest possible value of that variable.

Datatype:

The value of the `.SmallestValue` suffix is numeric.

Dimension:

The `.SmallestValue` suffix has the same dimension and domain as that of the variable at hand.

Remarks:

- The default of the option `Calculate Sensitivity Ranges` is on.
- See also Section [14.1](#) of the Language Reference.

.LargestValue

Definition:

When the property `ValueRange` of a variable is set and the option `Calculate Sensitivity Ranges` is not set to off a value range sensitivity analysis is conducted such that the objective value remains constant. As a result of this analysis the variable suffix `.LargestValue` contains the largest possible value of that variable.

Datatype:

The value of the `.LargestValue` suffix is numeric.

Dimension:

The `.LargestValue` suffix has the same dimension and domain as that of the variable at hand.

Remarks:

- The default of the option `Calculate Sensitivity Ranges` is on.
- See also Section [14.1](#) of the Language Reference.