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## **AIMMS Function Reference - Variable and Constraint Suffices**

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## Variable and Constraint Suffices

AIMMS variables support the following collection of suffices. The suffices supported by AIMMS common to variables and constraints are the following collection of suffices common to variables and constraint:

- .Basic
- .Level
- .Lower
- .Stochastic
- .Upper
- .Violation
- .ExtendedConstraint
- .ExtendedVariable

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**.Basic****Definition:**

When the property `Basic` of a constraint or variable is set or when the option `Always store basics` is set to `on`, the `.Basic` suffix contains basis status of the constraint or variable at the end of a solve.

**Datatype:**

The value of the `.Basic` suffix is an element in the predeclared set `AllBasicValues`.

**Dimension:**

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

**Remarks:**

- The default of the option `Always store basics` is `on`.
- In order to access the basic status of the definition of a variable `X` use the notation `X_definition.Basic`.
- See also Section [14.1](#) of the Language Reference

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## **.Level**

### **Definition:**

The `.Level` suffix contains the current value of a variable. When the property `Level` of a constraint is set, the `.Level` suffix contains the current value of the left hand side of the constraint after the last solve.

### **Datatype:**

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

### **Dimension:**

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

### **Remarks:**

- When a variable without a suffix is used inside an assignment statement or a parameter definition the `.Level` suffix is automatically used.
- See also Section [14.2.5](#) of the Language Reference.
- The GAMS and AIMMS 2 equivalent suffix name is `.l`.

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**.Lower****Definition:**

The `.Lower` suffix contains the lower bound of a variable. When the property `Bounds` of a constraint is set, the `.Lower` suffix contains the minimum value the left hand side of the constraint may attain. Note that for a `<=` constraint this value is `-INF`. This value is set at the end of the generation step by AIMMS.

**Datatype:**

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

**Dimension:**

The `.Lower` 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 (see `.Upper`) of a 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 [14.1](#)).
- In order to access the lower bound of the definition of a variable `X` use the notation `X_definition.Lower`.
- See also Sections [14.1](#) and [14.2.5](#) of the Language Reference.
- The GAMS and AIMMS 2 equivalent suffix name is `.lo`.

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## **.Stochastic**

### **Definition:**

When the property `Stochastic` of a parameter or variable is set, the `.Stochastic` suffix contains the stochastic data of that parameter or variable. When the definition of a constraint contains a parameter or variable with the `Stochastic` property set the `.Stochastic` suffix of that constraint contains the stochastic rows.

### **Datatype:**

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

### **Dimension:**

The dimension of `.Stochastic` suffix is one higher than that of the identifier at hand. The domain of the `.Stochastic` suffix is prefixed with the set `AllStochasticScenarios` to the domain of the identifier at hand. The index domain of the `.Stochastic` suffix is prefixed with the index `IndexStochasticScenarios` to the index domain of the identifier at hand.

### **Remarks:**

- See also Chapter [19](#) of the Language Reference.

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## **.Upper**

### **Definition:**

The `.Upper` suffix contains the upper bound of a variable. When the property `Bounds` of a constraint is set, the `.Upper` suffix contains the maximum value the left hand side of the constraint may attain. Note that for a `>=` constraint this value is `INF`. This value is set at the end of the generation step by AIMMS.

### **Datatype:**

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

### **Dimension:**

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

### **Remarks:**

- When the `.Lower` suffix (see `.Lower`) of a variable is equal to the `.Upper` suffix of that variable this variable is treated as a frozen variable and subsequently removed from the generated mathematical program independently from the setting of the `.nonvar` suffix (see 14.1).
- In order to access the upper bound of the definition of a variable `X` use the notation `X_definition.Upper`.
- See also Sections 14.1 and 14.2.5 of the Language Reference.
- The GAMS and AIMMS 2 equivalent suffix name is `.up`.

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**.Violation****Definition:**

The `.Violation` suffix of a variable contains the amount by which one of the bounds of that variable is violated. The `.Violation` suffix of a constraint contains the amount by which the definition of that constraint is violated.

**Datatype:**

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

**Dimension:**

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

**Remarks:**

- When a variable `X` has a definition the suffix `.DefinitionViolation` can be used to obtain the violation of the defining constraint of `X`. An alternative is to use `X.definition.Violation`.
- See also Section [15.4.2](#) of the Language Reference and `.DefinitionViolation`.

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**.ExtendedConstraint****Definition:**

The `.ExtendedConstraint` suffix is the extended constraint associated with a constraint, variable or mathematical program. It is an identifier in itself and typically used with AOA.

**Dimension:**

The dimension of the suffix `.ExtendedConstraint` is one higher than the dimension of the identifier at hand. The domain of the suffix `.ExtendedConstraint` is the set `AllGMPExtensions` followed by the domain of the identifier at hand.

**Remarks:**

- See also Section [21.3.6](#) of the Language Reference.

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**.ExtendedVariable****Definition:**

The `.ExtendedVariable` suffix is the extended variable associated with a constraint, variable or mathematical program. It is an identifier in itself and typically used with the AOA solver.

**Dimension:**

The dimension of the suffix `.ExtendedVariable` is one higher than the dimension of the identifier at hand. The domain of the suffix `.ExtendedVariable` is the set `AllGMPExtensions` followed by the domain of the identifier at hand.

**Remarks:**

- See also Section [21.3.6](#) of the Language Reference.