

INSERT - SQL

Common Set Syntax:

$\text{INSERT INTO } table\text{-name} \left\{ \begin{array}{l} (*) [VALUES\text{-clause}] \\ [(column\text{-list})] VALUE\text{-LIST} \end{array} \right\}$
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Extended Set Syntax:

$\text{INSERT INTO } table\text{-name} \left\{ \begin{array}{l} (*) [OVERRIDING USER VALUE] [VALUES\text{-clause}] \\ [(column\text{-list})] [include\text{-columns}] [OVERRIDING USER VALUE] VALUE\text{-LIST} \end{array} \right\}$

This chapter covers the following topics:

- Function
- Syntax Description
- Example

For an explanation of the symbols used in the syntax diagram, see *Syntax Symbols*.

Belongs to Function Group: *Database Access and Update*

See also the following sections in the *Database Management System Interfaces* documentation:

- *INSERT - SQL* in the *Natural for DB2* part.
- *INSERT - SQL* in the *Natural SQL Gateway* part.
- *INSERT - SQL* in the *Natural for SQL/DS* part.

Function

The SQL INSERT statement is used to add one or more new rows to a table.

Syntax Description

Syntax Element	Description
INTO <i>table-name</i>	<p>INTO Clause:</p> <p>In the INTO clause, the table is specified into which the new rows are to be inserted.</p> <p>See further information on <i>table-name</i>.</p>

Syntax Element	Description
<i>column-list</i>	<p>Column List:</p> <p>Syntax:</p> <p><i>column-name . . .</i></p> <p>In the <i>column-list</i>, one or more <i>column-names</i> can be specified, which are to be supplied with values in the row currently inserted.</p> <p>If a <i>column-list</i> is specified, the sequence of the columns must match with the sequence of the values either specified in the <i>insert-item-list</i> or contained in the specified view (see below).</p> <p>If the <i>column-list</i> is omitted, the values in the <i>insert-item-list</i> or in the specified view are inserted according to an implicit list of all the columns in the order they exist in the table.</p>
<i>include-columns</i>	<p>Include Columns Clause:</p> <p>Specifies a set of columns that are included, along with the columns of <i>table-name</i>, in the result table of the INSERT statement when it is nested in the FROM clause of a SELECT statement. For further details, see <i>include-columns</i>.</p>
<i>VALUES-clause</i>	<p>Values Clause:</p> <p>With the VALUES clause, you insert a <i>single</i> row into the table. See <i>VALUES Clause</i> below.</p>

Syntax Element	Description
<i>insert-item-list</i>	<p>INSERT Single Row:</p> <p>In the <i>insert-item-list</i>, you can specify one or more values to be assigned to the columns specified in the <i>column-list</i>. The sequence of the specified values must match the sequence of the columns.</p> <p>If no <i>column-list</i> is specified, the values in the <i>insert-item-list</i> are inserted according to an implicit list of all the columns in the order they exist in the table.</p> <p>The values to be specified in the <i>insert-item-list</i> can be <i>constants</i>, <i>parameters</i>, <i>special-registers</i> or NULL.</p> <p>See the section <i>Basic Syntactical Items</i> for information on <i>view-name</i>, <i>constant</i> and <i>parameter</i>. See also the information on <i>special-register</i>.</p> <p>If the value NULL has been assigned, this means that the addressed field is to receive no value (not even the value 0 or "blank").</p> <p>Example - INSERT Single Row:</p> <pre> ... INSERT INTO SQL-PERSONNEL (NAME,AGE) VALUES ('ADKINSON',35) ... </pre>
OVERRIDING USER VALUE	<p>OVERRIDING USER VALUE Clause:</p> <p>This clause belongs to the SQL Extended Set.</p> <p>When you specify this clause, the value specified in the VALUES clause or produced by a fullselect for a column that is defined as GENERATED ALWAYS will be ignored.</p>

VALUES Clause

With the VALUES clause, you insert a *single* row into the table. Depending on whether an asterisk (*) or a *column-list* has been specified, the VALUES clause can take one of the following forms:

VALUES Clause with Preceding Asterisk Notation

VALUES (VIEW <i>view-name</i>)

If asterisk notation is specified, a view *must* be specified in the VALUES clause. With the field values of this view, a new row is inserted into the specified table using the field names of the view as column names of the row.

VALUES Clause with Preceding Column List

```
[(column-list)] [OVERRIDING USER VALUE] VALUE-LIST
```

If a *column-list* is specified and a view is referenced in the VALUES Clause, the number of items specified in the column list must correspond to the number of fields defined in the view within the *VALUE-LIST*.

If no *column-list* is specified, the fields defined in the view are inserted according to an implicit list of all the columns in the order they exist in the specified table.

VALUE-LIST

Common Set Syntax:

```
{ VALUES { (VIEW view-name) } [FOR-n-ROWS-clause] }
  { (insert-item-list) }
```

Extended Set Syntax:

```
{ VALUES { (VIEW view-name) } [FOR-n-ROWS-clause] }
  { [WITH_CTE common-table-expression,...] select-expression [ WITH { RR } ] [ QUERYNO ] }
  { { RS } } [ integer ] }
```

Syntax Description:

Syntax Element	Description
VIEW <i>view-name</i>	<p>View Name:</p> <p>With the field values of this view, a new row is inserted into the specified table using the field names of the view as column names of the row.</p>

Syntax Element	Description
<i>insert-item-list</i>	<p>INSERT Single Row:</p> <p>In the <i>insert-item-list</i>, you can specify one or more values to be assigned to the columns specified in the column-list. The sequence of the specified values must match the sequence of the columns.</p> <p>If no <i>column-list</i> is specified, the values in the <i>insert-item-list</i> are inserted according to an implicit list of all the columns in the order they exist in the table.</p> <p>The values to be specified in the <i>insert-item-list</i> can be constants, parameters, special-registers or NULL.</p> <p>See the section <i>Basic Syntactical Items</i> for information on <i>view-name</i>, <i>constant</i> and <i>parameter</i>. See also the information on special-register.</p> <p>If the value NULL has been assigned, this means that the addressed field is to receive no value (not even the value 0 or blank).</p> <p>Example - INSERT Single Row:</p> <pre>... INSERT INTO SQL-PERSONNEL (NAME,AGE) VALUES ('ADKINSON' , 35) ...</pre>
<i>FOR-n-ROWS-clause</i>	<p>FOR <i>n</i> Rows Clause:</p> <p>Optional clause, see <i>FOR-n-ROWS-Clause</i> below.</p>
<p>WITH_CTE <i>common-table-expression</i></p>	<p>WITH_CTE Clause:</p> <p>This clause belongs to the SQL Extended Set.</p> <p>This optional clause permits defining a result table which can be referenced in any FROM clause of the SELECT statement that follows. Multiple common-table-expressions can be specified following the single WITH_CTE keyword. Each common-table-expression can also be referenced in the FROM clause of subsequent common-table-expression.</p> <p>For more information, see <i>WITH CTE common-table-expression,...</i> in the section <i>SELECT - Cursor-Oriented</i>.</p>

Syntax Element	Description						
<i>select-expression</i>	<p>INSERT Multiple Rows:</p> <p>This clause belongs to the SQL Extended Set.</p> <p>With a <i>select-expression</i>, you insert <i>multiple</i> rows into a table. The <i>select-expression</i> is evaluated and each row of the result table is treated as if the values in this row were specified as values in a <i>VALUES Clause</i> of a single-row INSERT operation.</p> <p>For further information, see <i>Select Expressions</i>.</p> <p>Example - Insert Multiple Rows:</p> <pre> ... INSERT INTO SQL-RETIREE (NAME,AGE,SEX) SELECT LASTNAME, AGE, SEX FROM SQL-EMPLOYEES WHERE AGE > 60 ... </pre> <p>Note: The number of rows that have actually been inserted can be ascertained by using the system variable *ROWCOUNT (see <i>System Variables</i> documentation).</p>						
WITH RR/RS/CS	<p>WITH Isolation Level Clause:</p> <p>This clause belongs to the SQL Extended Set.</p> <p>This clause allows the explicit specification of the isolation level used when locating the rows to be inserted.</p> <table border="1"> <tr> <td>CS</td> <td>Cursor Stability</td> </tr> <tr> <td>RR</td> <td>Repeatable Read</td> </tr> <tr> <td>RS</td> <td>Read Stability</td> </tr> </table>	CS	Cursor Stability	RR	Repeatable Read	RS	Read Stability
CS	Cursor Stability						
RR	Repeatable Read						
RS	Read Stability						
QUERYNO_ <i>integer</i>	<p>QUERYNO Clause:</p> <p>This clause belongs to the SQL Extended Set.</p> <p>This clause explicitly specifies the number to be used in EXPLAIN output and trace records for this statement.</p>						

FOR-n-ROWS-Clause

$\text{FOR } \left\{ \begin{array}{l} [:]_host\text{-variable} \\ integer \end{array} \right\} \text{ ROWS } \left[\left[\left\{ \begin{array}{l} \text{ATOMIC} \\ \text{NOT ATOMIC CONTINUE ON SQLEXCEPTION} \end{array} \right\} \right] \right]$
--

This clause is composed of the following subclauses:

FOR [:] *hostvariable/integer* ROWS Clause

FOR { <i>[:]_host-variable</i> } ROWS { <i>integer</i> }

The specification of this clause is optional. It should only be specified, if

- compiler option DB2ARRAY is specified
- and multiple rows are to be inserted from arrays specified in the *insert-item-list* of the *VALUES Clause*.

If specified, *[:]_hostvariable/integer* determines the number of rows to be inserted into the DB2 table from the arrays specified in the *insert-item-list* of the *VALUES Clause* starting with the first occurrence.

The purpose of this clause is to improve the performance of programs inserting rows from Natural arrays in a loop. By using this clause, the rows contained in the arrays can be inserted by one SQL statement.

See example below.

See also the *Natural for DB2* part in the *Database Management System Interfaces* documentation.

ATOMIC Clause

{ ATOMIC NOT ATOMIC CONTINUE ON SQLEXCEPTION }

This clause specifies whether the insertion of multiple rows should be treated by DB2 as an atomic operation or not.

It should only be specified, if

- compiler option DB2ARRAY is specified
- and multiple rows are to be inserted from arrays specified in the *insert-item-list* of the *VALUES Clause*.

Syntax Description:

Syntax Element	Description
ATOMIC	Specifies that in case of any error no row is inserted into the target table. This is the default value.
NOT ATOMIC CONTINUE ON SQLEXCEPTION	Specifies that in case of errors all rows for which no error occurred are inserted while those rows for which errors occurred are discarded by DB2.

See the *DB2 SQL REFERENCE* for sqlcodes returned in such cases.

Example

```

DEFINE DATA LOCAL
01 NAME          (A20/1:10)  INIT <'ZILLER1','ZILLER2','ZILLER3','ZILLER4'
                                ,'ZILLER5','ZILLER6','ZILLER7','ZILLER8'
                                ,'ZILLER9','ZILLERA'>
01 ADDRESS       (A100/1:10) INIT <'ANGEL STREET 1','ANGEL STREET 2'
                                ,'ANGEL STREET 3','ANGEL STREET 4'
                                ,'ANGEL STREET 5','ANGEL STREET 6'
                                ,'ANGEL STREET 7','ANGEL STREET 8'
                                ,'ANGEL STREET 9','ANGEL STREET 10'>
01 DATENATD     (D/1:10)   INIT <D'1954-03-27',D'1954-03-27',D'1954-03-27'
                                ,D'1954-03-27',D'1954-03-27',D'1954-03-27'
                                ,D'1954-03-27',D'1954-03-27',D'1954-03-27'
                                ,D'1954-03-27'>
01 SALARY       (P4.2/1:10) INIT <1000,2000,3000,4000,5000
                                ,6000,7000,8000,9000,9999>
01 L$ADDRESS    (I2/1:10)  INIT <14,14,14,14,14,14,14,14,14,15>
01 N$ADDRESS    (I2/1:10)  INIT <00,00,00,00,00,00,00,00,00,00>
01 ROWS         (I4)
01 INDEX        (I4)
01 V1 VIEW OF NAT-DEMO_ID
02 NAME
02 ADDRESS      (EM=X(20))
02 DATEOFBIRTH
02 SALARY
01 ROWCOUNT   (I4)
END-DEFINE
OPTIONS DB2ARRY=ON                /* <-- ENABLE DB2 ARRAY
ROWCOUNT := 10
INSERT INTO NAT-DEMO_ID
  (NAME,ADDRESS,DATEOFBIRTH,SALARY)
VALUES
  (:NAME(*),                      /* <-- ARRAY
   :ADDRESS(*)                    /* <-- ARRAY
   INDICATOR :N$ADDRESS(*)        /* <-- ARRAY
   LINDICATOR :L$ADDRESS(*),      /* <-- ARRAY DB2 VCHAR
   :DATENATD(1:10),              /* <-- ARRAY NATURAL DATES
   :SALARY(01:10)                /* <-- ARRAY NATURAL PACKED
  )
  FOR :ROWCOUNT ROWS
SELECT * INTO VIEW V1 FROM NAT-DEMO_ID WHERE NAME > 'Z'
DISPLAY V1                        /* <-- VERIFY INSERT
END-SELECT
END

```