

# Package ‘SqlRender’

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**Type** Package

**Title** Rendering Parameterized SQL and Translation to Dialects

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**Description** A rendering tool for parameterized SQL that also translates into different SQL dialects. These dialects include 'Microsoft Sql Server', 'Oracle', 'PostgreSQL', 'Amazon RedShift', 'Apache Impala', 'IBM Netezza', 'Google BigQuery', 'Microsoft PDW', 'Apache Spark', and 'SQLite'.

**SystemRequirements** Java version 8 or higher (<https://www.java.com/>)

**License** Apache License 2.0

**VignetteBuilder** knitr

**URL** <https://ohdsi.github.io/SqlRender/>, <https://github.com/OHDSI/SqlRender>

**BugReports** <https://github.com/OHDSI/SqlRender/issues>

**Imports** rJava,  
rlang

**Suggests** testthat,  
knitr,  
rmarkdown,  
shiny,  
shinydashboard

**RoxygenNote** 7.1.2

**Encoding** UTF-8

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camelCaseToSnakeCase	<i>Convert a camel case string to snake case</i>
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**Description**

Convert a camel case string to snake case

**Usage**

camelCaseToSnakeCase(string)

**Arguments**

string	The string to be converted
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**Value**

A string

**Examples**

camelCaseToSnakeCase("exposureConceptId1")

---

`camelCaseToSnakeCaseNames`*Convert the names of an object from camel case to snake case*

---

**Description**

Convert the names of an object from camel case to snake case

**Usage**

```
camelCaseToSnakeCaseNames(object)
```

**Arguments**

`object`                      The object of which the names should be converted

**Value**

The same object, but with converted names.

**Examples**

```
x <- data.frame(conceptId = 1, conceptName = "b")
camelCaseToSnakeCaseNames(x)
```

---

`camelCaseToTitleCase`    *Convert a camel case string to title case*

---

**Description**

Convert a camel case string to title case

**Usage**

```
camelCaseToTitleCase(string)
```

**Arguments**

`string`                      The string to be converted

**Value**

A string

**Examples**

```
camelCaseToTitleCase("exposureConceptId1")
```

---

`createRWrapperForSql` *Create an R wrapper for SQL*

---

## Description

`createRWrapperForSql` creates an R wrapper for a parameterized SQL file. The created R script file will contain a single function, that executes the SQL, and accepts the same parameters as specified in the SQL.

## Usage

```
createRWrapperForSql(  
  sqlFilename,  
  rFilename,  
  packageName,  
  createRoxygenTemplate = TRUE  
)
```

## Arguments

<code>sqlFilename</code>	The SQL file.
<code>rFilename</code>	The name of the R file to be generated. Defaults to the name of the SQL file with the extension reset to R.
<code>packageName</code>	The name of the package that will contains the SQL file.
<code>createRoxygenTemplate</code>	If true, a template of Roxygen comments will be added.

## Details

This function reads the declarations of defaults in the parameterized SQL file, and creates an R function that exposes the parameters. It uses the `loadRenderTranslateSql` function, and assumes the SQL will be used inside a package. To use inside a package, the SQL file should be placed in the `inst/sql/sql_server` folder of the package.

## Examples

```
## Not run:  
# This will create a file called CohortMethod.R:  
createRWrapperForSql("CohortMethod.sql", packageName = "CohortMethod")  
  
## End(Not run)
```

---

getTempTablePrefix	<i>Get the prefix used for emulated temp tables for DBMSs that do not support temp tables (e.g. Oracle, BigQuery).</i>
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---

**Description**

Get the prefix used for emulated temp tables for DBMSs that do not support temp tables (e.g. Oracle, BigQuery).

**Usage**

```
getTempTablePrefix()
```

**Value**

The prefix string.

**Examples**

```
getTempTablePrefix()
```

---

launchSqlRenderDeveloper	<i>Launch the SqlRender Developer Shiny app</i>
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---

**Description**

Launch the SqlRender Developer Shiny app

**Usage**

```
launchSqlRenderDeveloper(launch.browser = TRUE)
```

**Arguments**

`launch.browser` Should the app be launched in your default browser, or in a Shiny window. Note: copying to clipboard will not work in a Shiny window.

**Details**

Launches a Shiny app that allows the user to develop SQL and see how it translates to the supported dialects.

---

`listSupportedDialects` *List the supported target dialects*

---

### Description

List the target dialects supported by the `translate` function.

### Usage

```
listSupportedDialects()
```

### Value

A data frame with two columns. The 'dialect' column contains the abbreviation used in `SqlRender`, and the 'description' column contains a more human-readable description.

### Examples

```
listSupportedDialects()
```

---

`loadRenderTranslateSql`  
*Load, render, and translate a SQL file in a package*

---

### Description

`loadRenderTranslateSql` Loads a SQL file contained in a package, renders it and translates it to the specified dialect

### Usage

```
loadRenderTranslateSql(
  sqlFilename,
  packageName,
  dbms = "sql server",
  ...,
  tempEmulationSchema = getOption("sqlRenderTempEmulationSchema"),
  oracleTempSchema = NULL,
  warnOnMissingParameters = TRUE
)
```

### Arguments

<code>sqlFilename</code>	The source SQL file
<code>packageName</code>	The name of the package that contains the SQL file
<code>dbms</code>	The target dialect. Currently 'sql server', 'oracle', 'postgres', and 'redshift' are supported
<code>...</code>	Parameter values used for render

**tempEmulationSchema**

Some database platforms like Oracle and Impala do not truly support temp tables. To emulate temp tables, provide a schema with write privileges where temp tables can be created.

**oracleTempSchema**

DEPRECATED: use tempEmulationSchema instead.

**warnOnMissingParameters**

Should a warning be raised when parameters provided to this function do not appear in the parameterized SQL that is being rendered? By default, this is TRUE.

**Details**

This function looks for a SQL file with the specified name in the inst/sql/<dbms> folder of the specified package. If it doesn't find it in that folder, it will try and load the file from the inst/sql/sql\_server folder and use the translate function to translate it to the requested dialect. It will subsequently call the render function with any of the additional specified parameters.

**Value**

Returns a string containing the rendered SQL.

**Examples**

```
## Not run:
renderedSql <- loadRenderTranslateSql("CohortMethod.sql",
  packageName = "CohortMethod",
  dbms = connectionDetails$dbms,
  CDM_schema = "cdmSchema"
)

## End(Not run)
```

readSql

*Reads a SQL file***Description**

readSql loads SQL from a file

**Usage**

```
readSql(sourceFile)
```

**Arguments**

sourceFile      The source SQL file

**Details**

readSql loads SQL from a file

**Value**

Returns a string containing the SQL.

**Examples**

```
## Not run:
readSql("myParamStatement.sql")

## End(Not run)
```

---

render	<i>Render SQL code based on parameterized SQL and parameter values</i>
--------	--

---

**Description**

render Renders SQL code based on parameterized SQL and parameter values.

**Usage**

```
render(sql = "", warnOnMissingParameters = TRUE, ...)
```

**Arguments**

sql	The parameterized SQL
warnOnMissingParameters	Should a warning be raised when parameters provided to this function do not appear in the parameterized SQL that is being rendered? By default, this is TRUE.
...	Parameter values

**Details**

This function takes parameterized SQL and a list of parameter values and renders the SQL that can be send to the server. Parameterization syntax:

**@parameterName** Parameters are indicated using a @ prefix, and are replaced with the actual values provided in the render call.

**{DEFAULT @parameterName = parameterValue}** Default values for parameters can be defined using curly and the DEFAULT keyword.

**{if}?{then}:{else}** The if-then-else pattern is used to turn on or off blocks of SQL code.

**Value**

A character string containing the rendered SQL.



## Examples

```
render("SELECT * FROM @a;", a = "myTable")
render("SELECT * FROM @a {@b}??{WHERE x = 1};", a = "myTable", b = "true")
render("SELECT * FROM @a {@b == ''}??{WHERE x = 1}:{ORDER BY x};", a = "myTable", b = "true")
render("SELECT * FROM @a {@b != ''}??{WHERE @b = 1};", a = "myTable", b = "y")
render("SELECT * FROM @a {1 IN (@c)}??{WHERE @b = 1};",
  a = "myTable",
  b = "y",
  c = c(1, 2, 3, 4)
)
render("{DEFAULT @b = \"someField\"}SELECT * FROM @a {@b != ''}??{WHERE @b = 1};",
  a = "myTable"
)
render("SELECT * FROM @a {@a == 'myTable' & @b != 'x'}??{WHERE @b = 1};",
  a = "myTable",
  b = "y"
)
render(
  sql = "SELECT * FROM @a;",
  warnOnMissingParameters = FALSE,
  a = "myTable",
  b = "missingParameter"
)
```

renderSql

*Deprecated: Render SQL code based on parameterized SQL and parameter values*

## Description

This function has been deprecated. Use [render](#) instead. This new function returns a character vector instead of a list.

## Usage

```
renderSql(sql = "", warnOnMissingParameters = TRUE, ...)
```

## Arguments

sql	The parameterized SQL
warnOnMissingParameters	Should a warning be raised when parameters provided to this function do not appear in the parameterized SQL that is being rendered? By default, this is TRUE.
...	Parameter values

## Value

A list containing the following elements:

**parameterizedSql** The original parameterized SQL code

**sql** The rendered sql

---

renderSqlFile	<i>Render a SQL file</i>
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---

## Description

renderSqlFile Renders SQL code in a file based on parameterized SQL and parameter values, and writes it to another file.

## Usage

```
renderSqlFile(sourceFile, targetFile, warnOnMissingParameters = TRUE, ...)
```

## Arguments

sourceFile	The source SQL file
targetFile	The target SQL file
warnOnMissingParameters	Should a warning be raised when parameters provided to this function do not appear in the parameterized SQL that is being rendered? By default, this is TRUE.
...	Parameter values

## Details

This function takes parameterized SQL and a list of parameter values and renders the SQL that can be send to the server. Parameterization syntax:

**@parameterName** Parameters are indicated using a @ prefix, and are replaced with the actual values provided in the render call.

**{DEFAULT @parameterName = parameterValue}** Default values for parameters can be defined using curly and the DEFAULT keyword.

**{if}?{then}:{else}** The if-then-else pattern is used to turn on or off blocks of SQL code.

## Examples

```
## Not run:
renderSqlFile("myParamStatement.sql", "myRenderedStatement.sql", a = "myTable")

## End(Not run)
```

---

snakeCaseToCamelCase    *Convert a snake case string to camel case*

---

**Description**

Convert a snake case string to camel case

**Usage**

```
snakeCaseToCamelCase(string)
```

**Arguments**

string                      The string to be converted

**Value**

A string

**Examples**

```
snakeCaseToCamelCase("exposure_concept_id_1")
```

---

snakeCaseToCamelCaseNames  
                                  *Convert the names of an object from snake case to camel case*

---

**Description**

Convert the names of an object from snake case to camel case

**Usage**

```
snakeCaseToCamelCaseNames(object)
```

**Arguments**

object                      The object of which the names should be converted

**Value**

The same object, but with converted names.

**Examples**

```
x <- data.frame(concept_id = 1, concept_name = "b")
snakeCaseToCamelCaseNames(x)
```

---

sparkHandleInsert	<i>Handles Spark Inserts</i>
-------------------	------------------------------

---

**Description**

This function is for Spark connections only, it handles insert commands, as Spark cannot handle inserts with aliased or subset columns.

**Usage**

```
sparkHandleInsert(sql, connection)
```

**Arguments**

sql	The SQL to be translated.
connection	The connection to the database server.

**Value**

A sql string with INSERT command modified to contain the full column list, padded with NULLS as needed.

---

splitSql	<i>Split a single SQL string into one or more SQL statements</i>
----------	--

---

**Description**

splitSql splits a string containing multiple SQL statements into a vector of SQL statements

**Usage**

```
splitSql(sql)
```

**Arguments**

sql	The SQL string to split into separate statements
-----	--

**Details**

This function is needed because some DBMSs (like ORACLE) do not accept multiple SQL statements being sent as one execution.

**Value**

A vector of strings, one for each SQL statement

**Examples**

```
splitSql("SELECT * INTO a FROM b; USE x; DROP TABLE c;")
```

supportsJava8

*Determine if Java virtual machine supports Java***Description**

Tests Java virtual machine (JVM) java.version system property to check if version  $\geq$  8.

**Usage**

```
supportsJava8()
```

**Value**

Returns TRUE if JVM supports Java  $\geq$  8.

**Examples**

```
supportsJava8()
```

translate

*Translates SQL from one dialect to another***Description**

translate translates SQL from one dialect to another.

**Usage**

```
translate(
  sql = "",
  targetDialect,
  tempEmulationSchema = getOption("sqlRenderTempEmulationSchema"),
  oracleTempSchema = NULL
)
```

**Arguments**

sql	The SQL to be translated
targetDialect	The target dialect. Currently "oracle", "postgresql", "pdw", "impala", "sqlite", "sqlite extended", "netezza", "bigquery", "spark", and "redshift" are supported. Use <a href="#">listSupportedDialects</a> to get the list of supported dialects.
tempEmulationSchema	Some database platforms like Oracle and Impala do not truly support temp tables. To emulate temp tables, provide a schema with write privileges where temp tables can be created.
oracleTempSchema	DEPRECATED: use tempEmulationSchema instead.

**Details**

This function takes SQL in one dialect and translates it into another. It uses simple pattern replacement, so its functionality is limited. Note that trailing semicolons are not removed for Oracle, which is required before sending a statement through JDBC. This will be done by [splitSql](#).

**Value**

A character string containing the translated SQL.

**Examples**

```
translate("USE my_schema;", targetDialect = "oracle")
```

---

```
translateSingleStatement
```

*Translates a single SQL statement from one dialect to another*

---

**Description**

translateSingleStatement translates a single SQL statement from one dialect to another.

**Usage**

```
translateSingleStatement(
  sql = "",
  targetDialect,
  tempEmulationSchema = getOption("sqlRenderTempEmulationSchema"),
  oracleTempSchema = NULL
)
```

**Arguments**

sql	The SQL to be translated
targetDialect	The target dialect. Currently "oracle", "postgresql", "pdw", "impala", "sqlite", "sqlite extended", "netezza", "bigquery", "spark", and "redshift" are supported.
tempEmulationSchema	Some database platforms like Oracle and Impala do not truly support temp tables. To emulate temp tables, provide a schema with write privileges where temp tables can be created.
oracleTempSchema	DEPRECATED: use tempEmulationSchema instead.

**Details**

This function takes SQL in one dialect and translates it into another. It uses simple pattern replacement, so its functionality is limited. This removes any trailing semicolon as required by Oracle when sending through JDBC. An error is thrown if more than one statement is encountered in the SQL.

**Value**

A character vector with the translated SQL.

**Examples**

```
translateSingleStatement("USE my_schema;", targetDialect = "oracle")
```

---

translateSql	<i>Deprecated: Translates SQL from one dialect to another</i>
--------------	---

---

**Description**

This function has been deprecated. Use [translate](#) instead. This new function returns a character vector instead of a list.

**Usage**

```
translateSql(sql = "", targetDialect, oracleTempSchema = NULL)
```

**Arguments**

sql	The SQL to be translated
targetDialect	The target dialect. Currently "oracle", "postgresql", "pdw", "impala", "netezza", "bigquery", "spark", and "redshift" are supported
oracleTempSchema	A schema that can be used to create temp tables in when using Oracle or Impala.

**Value**

A list containing the following elements:

**originalSql** The original parameterized SQL code

**sql** The translated SQL

---

translateSqlFile	<i>Translate a SQL file</i>
------------------	-----------------------------

---

**Description**

This function takes SQL and translates it to a different dialect.

**Usage**

```
translateSqlFile(
  sourceFile,
  targetFile,
  targetDialect,
  tempEmulationSchema = getOption("sqlRenderTempEmulationSchema"),
  oracleTempSchema = NULL
)
```

**Arguments**

sourceFile	The source SQL file
targetFile	The target SQL file
targetDialect	The target dialect. Currently "oracle", "postgresql", "pdw", "impala", "sqlite", "netezza", "bigquery", "spark", and "redshift" are supported.
tempEmulationSchema	Some database platforms like Oracle and Impala do not truly support temp tables. To emulate temp tables, provide a schema with write privileges where temp tables can be created.
oracleTempSchema	DEPRECATED: use tempEmulationSchema instead.

**Details**

This function takes SQL and translates it to a different dialect.

**Examples**

```
## Not run:
translateSqlFile("myRenderedStatement.sql",
  "myTranslatedStatement.sql",
  targetDialect = "postgresql"
)

## End(Not run)
```

---

writeSql	<i>Write SQL to a SQL (text) file</i>
----------	---------------------------------------

---

**Description**

writeSql writes SQL to a file

**Usage**

```
writeSql(sql, targetFile)
```

**Arguments**

sql	A string containing the sql
targetFile	The target SQL file

**Details**

writeSql writes SQL to a file

**Examples**

```
## Not run:
sql <- "SELECT * FROM @table_name"
writeSql(sql, "myParamStatement.sql")

## End(Not run)
```



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