

# Package ‘pool’

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**Type** Package

**Title** Object Pooling

**Version** 0.1.1

**Description** Enables the creation of object pools, which make it less computationally expensive to fetch a new object. Currently the only supported pooled objects are 'DBI' connections.

**License** GPL-3

**Depends** R (>= 3.0.0), methods

**Imports** DBI, R6, dplyr, dbplyr, later

**Suggests** testthat, tibble, RSQLite

**URL** <https://github.com/rstudio/pool>

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'DBI.R' 'DBI-connection-interpolate.R' 'DBI-connection-quote.R'  
'DBI-connection-sql.R' 'DBI-connection-transaction.R'  
'DBI-connection.R' 'DBI-driver.R' 'DBI-object-deprecated.R'  
'DBI-object.R' 'DBI-pool.R' 'dbplyr.R'

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DBI-connection	<i>DBIConnection methods.</i>
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**Description**

Pool object wrappers around DBIConnection methods. For the original documentation, see:

- [dbSendQuery](#)
- [dbGetQuery](#)
- [dbListResults](#)
- [dbListFields](#)
- [dbListTables](#)
- [dbReadTable](#)
- [dbWriteTable](#)
- [dbExistsTable](#)
- [dbRemoveTable](#)

**Usage**

```
## S4 method for signature 'Pool'
dbSendQuery(conn, statement, ...)
```

```
## S4 method for signature 'Pool,ANY'
dbGetQuery(conn, statement, ...)
```

```
## S4 method for signature 'Pool,ANY'
```

```
dbExecute(conn, statement, ...)  
  
## S4 method for signature 'Pool'  
dbListResults(conn, ...)  
  
## S4 method for signature 'Pool'  
dbListFields(conn, name, ...)  
  
## S4 method for signature 'Pool'  
dbListTables(conn, ...)  
  
## S4 method for signature 'Pool,ANY'  
dbReadTable(conn, name, ...)  
  
## S4 method for signature 'Pool'  
dbWriteTable(conn, name, value, ...)  
  
## S4 method for signature 'Pool'  
dbExistsTable(conn, name, ...)  
  
## S4 method for signature 'Pool'  
dbRemoveTable(conn, name, ...)
```

### Arguments

conn, statement, ...  
See [dbSendQuery](#).  
name, value See [dbWriteTable](#).

---

DBI-connection-interpolate

*Safely interpolate values into an SQL string and parse them back.*

---

### Description

Pool object wrappers around DBIConnection methods that deal with the safe interpolation of values into an SQL string and the reverse – parsing interpolated variables from SQL. See [sqlInterpolate](#) and [sqlParseVariables](#) for the original documentation.

### Usage

```
## S4 method for signature 'Pool'  
sqlInterpolate(conn, sql, ..., .dots = list())  
  
## S4 method for signature 'Pool'  
sqlParseVariables(conn, sql, ...)
```

**Arguments**

conn, sql, ..., .dots  
 See [sqlInterpolate](#).

---

DBI-connection-quote    *SQL quoting.*

---

**Description**

Pool object wrappers around DBIConnection methods that deal with SQL escaping needs. See [SQL](#) for the original documentation.

**Usage**

```
## S4 method for signature 'Pool,character'
dbQuoteIdentifier(conn, x, ...)
```

```
## S4 method for signature 'Pool,SQL'
dbQuoteIdentifier(conn, x, ...)
```

```
## S4 method for signature 'Pool,Table'
dbQuoteIdentifier(conn, x, ...)
```

```
## S4 method for signature 'Pool,character'
dbQuoteString(conn, x, ...)
```

```
## S4 method for signature 'Pool,SQL'
dbQuoteString(conn, x, ...)
```

**Arguments**

conn, x, ...    See [SQL](#).

---

DBI-connection-sql    *Creating and manipulating SQL tables.*

---

**Description**

Pool object wrappers around DBIConnection methods that deal with the creation and manipulation of SQL tables. See [sqlData](#), [sqlCreateTable](#) and [sqlAppendTable](#) for the original documentation.

**Usage**

```
## S4 method for signature 'Pool'  
sqlData(con, value, row.names = NA, ...)  
  
## S4 method for signature 'Pool'  
sqlCreateTable(con, table, fields, row.names = NA,  
  temporary = FALSE, ...)  
  
## S4 method for signature 'Pool'  
sqlAppendTable(con, table, values, row.names = NA, ...)
```

**Arguments**

```
con, value, row.names, ...  
    See sqlData.  
table, fields, temporary  
    See sqlCreateTable.  
values      See sqlAppendTable.
```

---

DBI-connection-transaction

*DBIConnection transaction methods are not supported for Pool objects.*

---

**Description**

You cannot perform SQL transaction using a Pool object directly (because that would imply keeping a connection open and not knowing when to return it back to the pool).

**Usage**

```
## S4 method for signature 'Pool'  
dbBegin(conn, ...)  
  
## S4 method for signature 'Pool'  
dbCommit(conn, ...)  
  
## S4 method for signature 'Pool'  
dbRollback(conn, ...)  
  
## S4 method for signature 'Pool'  
dbWithTransaction(conn, code)
```

**Arguments**

```
conn, ..., code  
    See transactions.
```

**Details**

If you must use these methods, fetch an actual connection first with `conn <- poolCheckout(pool)` – then call the appropriate DBI method on `conn`. Since you’re fetching a connection from the pool yourself, you must also remember to return it back to the pool when you’re done: `poolReturn(conn)` (otherwise, you have a leaked connection).

For simple transactions, consider using [poolWithTransaction](#) instead, which is safer since it does not require you to fetch and release the connection yourself.

See [transactions](#) for the original documentation.

---

 DBI-object

*DBIObject methods.*


---

**Description**

Pool object wrappers around DBIObject methods. See [dbDataType](#), [dbGetInfo](#) and [dbIsValid](#) for the original documentation.

**Usage**

```
## S4 method for signature 'Pool'
dbDataType(dbObj, obj, ...)
```

```
## S4 method for signature 'Pool'
dbGetInfo(dbObj, ...)
```

```
## S4 method for signature 'Pool'
dbIsValid(dbObj, obj, ...)
```

**Arguments**

`dbObj`, `obj`, ...

See [dbDataType](#).

---

 DBI-object-deprecated *Make R identifiers into legal SQL identifiers.*


---

**Description**

Pool object wrappers around DBIObject methods. See [make.db.names](#) for the original documentation. Note that these methods are DEPRECATED. Please use `dbQuoteIdentifier` (or possibly `dbQuoteString`) instead, as documented in [DBI-connection-quote](#).

**Usage**

```
## S4 method for signature 'Pool,character'
make.db.names(dbObj, snames,
  keywords = .SQL92Keywords, unique = TRUE, allow.keywords = TRUE, ...)

## S4 method for signature 'Pool,character'
isSQLKeyword(dbObj, name,
  keywords = .SQL92Keywords, case = c("lower", "upper", "any")[3], ...)

## S4 method for signature 'Pool'
SQLKeywords(dbObj, ...)
```

**Arguments**

dbObj, snames, keywords, unique, allow.keywords, name, case, ...  
 see [make.db.names](#)

---

 dbPool

---

*Create a DBI Database Connection Pool.*


---

**Description**

A wrapper around `poolCreate` to simplify the creation of a DBI database connection pool. Check the documentation of [poolCreate](#) for a generic overview of the parent function and the Pool object. The main thing to point out is that, for `dbPool`, you always need to provide a DBI driver (i.e. of class [DBIDriver-class](#)), and it should always be accompanied by the required authorization arguments (see the example below).

**Usage**

```
dbPool(drv, ..., validateQuery = NULL)
```

**Arguments**

drv	An object that inherits from <a href="#">DBIDriver-class</a> , or an existing <a href="#">DBIConnection-class</a> object (in order to clone an existing connection).
...	Arguments needed for both <a href="#">dbConnect</a> (mandatory if required by the <a href="#">DBIDriver</a> you're using) and <a href="#">poolCreate</a> (optional) - all arguments should be named: <ol style="list-style-type: none"> <li>1. The required authorization arguments needed by the DBMS instance; these typically include user, password, dbname, host, port, etc. For details check the appropriate <a href="#">DBIDriver's</a> documentayion.</li> <li>2. Optionally, override the <code>poolCreate</code> defaults: <code>minSize</code> (minimum number of connections that the pool should have at all times), <code>maxSize</code> (maximum number of connections that the pool may have at any time), <code>idleTimeout</code> (number of seconds to wait before closing a connection, if the number of connection is above <code>minSize</code>), and <code>validationInterval</code> (number of seconds to wait before validating the connection again).</li> </ol>

`validateQuery` The query to run to verify that the connection is valid (it should be as simple as possible). If this is not provided, `dbPool` will try a few possibilities, but these are not exhaustive.

### Examples

```
## Not run:
pool <- dbPool(
  drv = RMySQL::MySQL(),
  dbname = "shinydemo",
  host = "shiny-demo.csa7qlmguqrf.us-east-1.rds.amazonaws.com",
  username = "guest",
  password = "guest"
)

dbGetQuery(pool, "SELECT * from City LIMIT 5;")
#>   ID      Name CountryCode  District Population
#> 1  1      Kabul          AFG      Kabul    1780000
#> 2  2  Qandahar          AFG  Qandahar    237500
#> 3  3      Herat          AFG      Herat    186800
#> 4  4 Mazar-e-Sharif      AFG      Balkh    127800
#> 5  5  Amsterdam          NLD Noord-Holland  731200

poolClose(pool)

## End(Not run)
```

---

object

*Pooled object methods.*

---

### Description

For backend authors only. Authors should implement all of these, which are then called by the Pool class methods. These should not be called directly either by backend authors or by the end users.

### Usage

```
onActivate(object)

onPassivate(object)

onDestroy(object)

onValidate(object, query)

## S4 method for signature 'DBIConnection'
onPassivate(object)

## S4 method for signature 'DBIConnection'
```



```
onDestroy(object)

## S4 method for signature 'DBIConnection'
onValidate(object)
```

### Arguments

object	A pooled object.
query	A simple query that can be used to verify that the object functions as expected.

---

Pool

*Pool Class.*

---

### Description

A generic pool class that holds objects. These can be fetched from the pool and released back to it at will, with very little computational cost. The pool should be created only once and closed when it is no longer needed, to prevent leaks. See [dbPool](#) for an example of object pooling applied to DBI database connections.

### Usage

```
poolCreate(factory, minSize = 1, maxSize = Inf,
  idleTimeout = 60, validationInterval = 600,
  state = NULL)

poolClose(pool)
```

### Arguments

factory	A factory function responsible for the generation of the objects that the pool will hold (ex: for DBI database connections, this function is <code>dbConnect</code> ). It must take no arguments.
minSize	An optional number specifying the minimum number of objects that the pool should have at all times.
maxSize	An optional number specifying the maximum number of objects that the pool may have at any time.
idleTimeout	The number of seconds that an idle object will be kept in the pool before it is destroyed (only applies if the number of objects is over the <code>minSize</code> ). Use <code>Inf</code> if you want created objects never to be destroyed (there isn't a great reason for this usually).
validationInterval	The minimum number of seconds that pool will wait before running a validation check on the next checked out object. By not necessarily validating every checked out object, there can be substantial performance gains (especially if the interval between checking out new objects is very small).
state	A pool public variable to be used by backend authors as necessary.
pool	A Pool object previously created with <code>poolCreate</code> .

**See Also**

[dbPool](#), [poolCheckout](#), [poolReturn](#)

---

Pool-class	<i>S4 class for compatibility with DBI methods</i>
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---

**Description**

S4 class for compatibility with DBI methods

---

poolCheckout	<i>Checks out an object from the pool.</i>
--------------	--

---

**Description**

Should be called by the end user if they need a persistent object, that is not returned to the pool automatically. When you don't longer need the object, be sure to return it to the pool using `poolReturn(object)`.

**Usage**

```
poolCheckout(pool)
```

**Arguments**

pool	The pool to get the object from.
------	----------------------------------

---

poolReturn	<i>Returns an object back to the pool.</i>
------------	--

---

**Description**

Should be called by the end user if they previously fetched an object directly using `object <- poolCheckout(pool)` and are now done with said object.

**Usage**

```
poolReturn(object)
```

**Arguments**

object	A pooled object.
--------	------------------

---

poolWithTransaction    *Self-contained database transactions using pool*

---

## Description

This function allows you to use a pool object directly to execute a transaction on a database connection, without ever having to actually check out a connection from the pool and then return it. Using this function instead of the direct transaction methods will guarantee that you don't leak connections or forget to commit/rollback a transaction.

## Usage

```
poolWithTransaction(pool, func)
```

```
dbBreak()
```

## Arguments

pool	The pool object to fetch the connection from.
func	A function that has one argument, conn (a database connection checked out from pool).

## Details

This function is similar to [dbWithTransaction](#), but its arguments work a little differently. First, it takes in a pool object, instead of a connection. Second, instead of taking an arbitrary chunk of code to execute as a transaction (i.e. either run all the commands successfully or not run any of them), it takes in a function. This function (the func argument) gives you an argument to use in its body, a database connection. So, you can use connection methods without ever having to check out a connection. But you can also use arbitrary R code inside the func's body. This function will be called once we fetch a connection from the pool. Once the function returns, we release the connection back to the pool.

Like its DBI sister [dbWithTransaction](#), this function calls `dbBegin()` before executing the code, and `dbCommit()` after successful completion, or `dbRollback()` in case of an error. This means that calling `poolWithTransaction` always has side effects, namely to commit or roll back the code executed when func is called. In addition, if you modify the local R environment from within func (e.g. setting global variables, writing to disk), these changes will persist after the function has returned.

Also, like [dbWithTransaction](#), there is also a special function called `dbBreak()` that allows for an early, silent exit with rollback. It can be called only from inside `poolWithTransaction`.

## Value

func's return value.

**Examples**

```

pool <- dbPool(RSQLite::SQLite(), dbname = ":memory:")

dbWriteTable(pool, "cars", head(cars, 3))
dbReadTable(pool, "cars") # there are 3 rows

## successful transaction
poolWithTransaction(pool, function(conn) {
  dbExecute(conn, "INSERT INTO cars (speed, dist) VALUES (1, 1);")
  dbExecute(conn, "INSERT INTO cars (speed, dist) VALUES (2, 2);")
  dbExecute(conn, "INSERT INTO cars (speed, dist) VALUES (3, 3);")
})
dbReadTable(pool, "cars") # there are now 6 rows

## failed transaction -- note the missing comma
tryCatch(
  poolWithTransaction(pool, function(conn) {
    dbExecute(conn, "INSERT INTO cars (speed, dist) VALUES (1, 1);")
    dbExecute(conn, "INSERT INTO cars (speed dist) VALUES (2, 2);")
    dbExecute(conn, "INSERT INTO cars (speed, dist) VALUES (3, 3);")
  }),
  error = identity
)
dbReadTable(pool, "cars") # still 6 rows

## early exit, silently
poolWithTransaction(pool, function(conn) {
  dbExecute(conn, "INSERT INTO cars (speed, dist) VALUES (1, 1);")
  dbExecute(conn, "INSERT INTO cars (speed, dist) VALUES (2, 2);")
  if (nrow(dbReadTable(conn, "cars")) > 7) dbBreak()
  dbExecute(conn, "INSERT INTO cars (speed, dist) VALUES (3, 3);")
})
dbReadTable(pool, "cars") # still 6 rows

poolClose(pool)

```

---

show,Pool-method

*Show method*


---

**Description**

Show method

**Usage**

```

## S4 method for signature 'Pool'
show(object)

```

**Arguments**

object            A Pool object.

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