Package 'odbc'

December 15, 2023

Title Connect to ODBC Compatible Databases (using the DBI Interface)

Version 1.4.0

Description A DBI-compatible interface to ODBC databases.

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URL https://r-dbi.github.io/odbc/, https://github.com/r-dbi/odbc, https://solutions.posit.co/connections/db/

BugReports https://github.com/r-dbi/odbc/issues

Depends R (>= 3.6.0)

Imports bit64,
blob (>= 1.2.0),
DBI (>= 1.0.0),
hms,
methods,
Rcpp (>= 0.12.11),
rlang (>= 0.2.0)

Suggests covr,
DBItest,
knitr,
magrittr,
rmarkdown,
RSQLite,
testthat (>= 3.0.0),
tibble,
withr

LinkingTo Rcpp

ByteCompile true

Config/Needs/check pkgbuild

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Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.2.3

SystemRequirements GNU make, An ODBC3 driver manager and drivers.

Collate 'RcppExports.R'
'connection-pane.R'
'dbi-connection.R'
'odbc-connection.R'
'db.R'
'dbi-driver.R'
'dbi-result.R'
'dbi-table.R'
'dbi.R'
'driver-access.R'
'driver-bigquery.R'
'driver-databricks.R'
'driver-db2.R'
'driver-hana.R'
'driver-hive.R'
'driver-impala.R'
'driver-mysql.R'
'driver-oracle.R'
'driver-postgres.R'
'driver-redshift.R'
'driver-snowflake.R'
'driver-spark.R'
'driver-sql-server.R'
'driver-sqlite.R'
'driver-teradata.R'
'driver-vertica.R'
'odbc-data-sources.R'
'odbc-data-type.R'
'odbc-drivers.R'
'odbc-package.R'
'odbc.R'
'utils.R'
'zzz.R'

VignetteBuilder knitr

R topics documented:

`databricks` *Helper for Connecting to Databricks via ODBC*

Description

Connect to Databricks clusters and SQL warehouses via the Databricks ODBC driver.

In particular, the custom `dbConnect()` method for the Databricks ODBC driver implements a subset of the Databricks client unified authentication model, with support for personal access tokens, OAuth machine-to-machine credentials, and OAuth user-to-machine credentials supplied via Posit Workbench or the Databricks CLI on desktop. All of these credentials are detected automatically if present using standard environment variables.

Usage

```
databricks()

## S4 method for signature 'DatabricksOdbcDriver'
dbConnect(
  drv,
  httpPath,
  workspace = Sys.getenv("DATABRICKS_HOST"),
  useNativeQuery = TRUE,
  driver = NULL,
  HTTPPath,
  ...
)
```

Arguments

`drv`	an object that inherits from DBIDriver, or an existing DBIConnection object (in order to clone an existing connection).
`httpPath, HTTPPath`	To query a cluster, use the HTTP Path value found under `Advanced Options > JDBC/ODBC` in the Databricks UI. For SQL warehouses, this is found under `Connection Details` instead.
`workspace`	The URL of a Databricks workspace, e.g. `"https://example.cloud.databricks.com"`.
`useNativeQuery`	Suppress the driver's conversion from ANSI SQL 92 to HiveSQL? The default (`TRUE`), gives greater performance but means that paramterised queries (and hence `dbWriteTable()`) do not work.
`driver`	The name of the Databricks ODBC driver, or `NULL` to use the default name.
`...`	Further arguments passed on to `dbConnect()`.

Value

An `OdbcConnection` object with an active connection to a Databricks cluster or SQL warehouse.

Examples

```
## Not run:
DBI::dbConnect(
  odbc::databricks(),
  httpPath = "sql/protocolv1/o/4425955464597947/1026-023828-vn51jugj"
)

## End(Not run)
```

DBI-tables *Convenience functions for reading/writing DBMS tables*

Description

Convenience functions for reading/writing DBMS tables

Usage

```
## S4 method for signature 'OdbcConnection,character,data.frame'
dbWriteTable(
  conn,
  name,
  value,
  overwrite = FALSE,
  append = FALSE,
  temporary = FALSE,
  row.names = NA,
  field.types = NULL,
  batch_rows = getOption("odbc.batch_rows", NA),
  ...
)

## S4 method for signature 'OdbcConnection,Id,data.frame'
dbWriteTable(
  conn,
  name,
  value,
  overwrite = FALSE,
  append = FALSE,
  temporary = FALSE,
  row.names = NA,
  field.types = NULL,
  batch_rows = getOption("odbc.batch_rows", NA),
  ...
)

## S4 method for signature 'OdbcConnection,SQL,data.frame'
dbWriteTable(
  conn,
  name,
  value,
```

```
  overwrite = FALSE,
  append = FALSE,
  temporary = FALSE,
  row.names = NA,
  field.types = NULL,
  batch_rows = getOption("odbc.batch_rows", NA),
  ...
)

## S4 method for signature 'OdbcConnection'
dbAppendTable(conn, name, value, ..., row.names = NULL)

## S4 method for signature 'OdbcConnection'
sqlCreateTable(
  con,
  table,
  fields,
  row.names = NA,
  temporary = FALSE,
  ...,
  field.types = NULL
)
```

Arguments

conn	a OdbcConnection object, produced by DBI::dbConnect()
name	a character string specifying a table name. Names will be automatically quoted so you can use any sequence of characters, not just any valid bare table name.
value	A data.frame to write to the database.
overwrite	Allow overwriting the destination table. Cannot be TRUE if append is also TRUE.
append	Allow appending to the destination table. Cannot be TRUE if overwrite is also TRUE.
temporary	If TRUE, will generate a temporary table statement.
row.names	Either TRUE, FALSE, NA or a string. If TRUE, always translate row names to a column called "row_names". If FALSE, never translate row names. If NA, translate rownames only if they're a character vector. A string is equivalent to TRUE, but allows you to override the default name. For backward compatibility, NULL is equivalent to FALSE.
field.types	Additional field types used to override derived types.
batch_rows	The number of rows to retrieve. Defaults to NA, which is set dynamically to the size of the input. Depending on the database, driver, dataset and free memory setting this to a lower value may improve performance.
...	Other arguments used by individual methods.
con	A database connection.
table	The table name, passed on to dbQuoteIdentifier(). Options are: • a character string with the unquoted DBMS table name, e.g. "table_name", • a call to Id() with components to the fully qualified table name, e.g. Id(schema = "my_schema", table = "table_name")

- a call to SQL() with the quoted and fully qualified table name given verbatim, e.g. SQL('"my_schema"."table_name"')

fields — Either a character vector or a data frame.

A named character vector: Names are column names, values are types. Names are escaped with dbQuoteIdentifier(). Field types are unescaped.

A data frame: field types are generated using dbDataType().

Examples

```
## Not run:
library(DBI)
con <- dbConnect(odbc::odbc())
dbListTables(con)
dbWriteTable(con, "mtcars", mtcars, temporary = TRUE)
dbReadTable(con, "mtcars")

dbListTables(con)
dbExistsTable(con, "mtcars")

# A zero row data frame just creates a table definition.
dbWriteTable(con, "mtcars2", mtcars[0, ], temporary = TRUE)
dbReadTable(con, "mtcars2")

dbDisconnect(con)

## End(Not run)
```

---

dbListTables,OdbcConnection-method

List remote tables and fields for an ODBC connection

Description

dbListTables() provides names of remote tables accessible through this connection; dbListFields() provides names of columns within a table.

Usage

```
## S4 method for signature 'OdbcConnection'
dbListTables(
  conn,
  catalog_name = NULL,
  schema_name = NULL,
  table_name = NULL,
  table_type = NULL,
  ...
)

## S4 method for signature 'OdbcConnection,character'
dbListFields(
  conn,
  name,
```

```
  catalog_name = NULL,
  schema_name = NULL,
  column_name = NULL,
  ...
)
```

Arguments

conn	A DBIConnection object, as returned by dbConnect().
catalog_name, schema_name, table_name	Catalog, schema, and table names. By default, catalog_name, schema_name and table_name will automatically escape underscores to ensure that you match exactly one table. If you want to search for multiple tables using wild cards, you will need to use odbcConnectionTables() directly instead.
table_type	The type of the table to return, the default returns all table types.
...	Other parameters passed on to methods.
name	The table name, passed on to dbQuoteIdentifier(). Options are: • a character string with the unquoted DBMS table name, e.g. "table_name", • a call to Id() with components to the fully qualified table name, e.g. Id(schema = "my_schema", table = "table_name") • a call to SQL() with the quoted and fully qualified table name given verbatim, e.g. SQL('"my_schema"."table_name"')
column_name	The name of the column to return, the default returns all columns.

Value

A character vector of table or field names respectively.

---

isTempTable *Helper method used to determine if a table identifier is that of a temporary table.*

Description

Currently implemented only for select back-ends where we have a use for it (SQL Server, for example). Generic, in case we develop a broader use case.

Usage

```
isTempTable(conn, name, ...)

## S4 method for signature 'OdbcConnection,Id'
isTempTable(conn, name, ...)

## S4 method for signature 'OdbcConnection,SQL'
isTempTable(conn, name, ...)
```

Arguments

conn	OdbcConnection
name	Table name
...	additional parameters to methods

---

odbc *Connect to a database via an ODBC driver*

Description

The dbConnect() method documented here is invoked when DBI::dbConnect() is called with the first argument odbc(). Connecting to a database via an ODBC driver is likely the first step in analyzing data using the odbc package; for an overview of package concepts, see the *Overview* section below.

Usage

```
odbc()

## S4 method for signature 'OdbcDriver'
dbConnect(
  drv,
  dsn = NULL,
  ...,
  timezone = "UTC",
  timezone_out = "UTC",
  encoding = "",
  bigint = c("integer64", "integer", "numeric", "character"),
  timeout = 10,
  driver = NULL,
  server = NULL,
  database = NULL,
  uid = NULL,
  pwd = NULL,
  dbms.name = NULL,
  attributes = NULL,
  .connection_string = NULL
)
```

Arguments

drv	An OdbcDriver, from odbc().
dsn	The data source name. For currently available options, see the name column of odbcListDataSources() output.
...	Additional ODBC keywords. These will be joined with the other arguments to form the final connection string. Note that ODBC parameter names are case-insensitive so that (e.g.) DRV and drv are equivalent. Since this is different to R and a possible source of confusion, odbc will error if you supply multiple arguments that have the same name when case is ignored.

Any argument values that contain `[]{}(),;?*=!@` will be "quoted" by wrapping in `{}`. You can opt-out of this behaviour by wrapping the value with `I()`.

`timezone` The server time zone. Useful if the database has an internal timezone that is *not* 'UTC'. If the database is in your local timezone, set this argument to `Sys.timezone()`. See `OlsonNames()` for a complete list of available time zones on your system.

`timezone_out` The time zone returned to R. If you want to display datetime values in the local timezone, set to `Sys.timezone()`.

`encoding` The text encoding used on the Database. If the database is not using UTF-8 you will need to set the encoding to get accurate re-encoding. See `iconvlist()` for a complete list of available encodings on your system. Note strings are always returned `UTF-8` encoded.

`bigint` The R type that `SQL_BIGINT` types should be mapped to. Default is bit64::integer64, which allows the full range of 64 bit integers.

`timeout` Time in seconds to timeout the connection attempt. Setting a timeout of `Inf` indicates no timeout. Defaults to 10 seconds.

`driver` The ODBC driver name or a path to a driver. For currently available options, see the `name` column of `odbcListDrivers()` output.

`server` The server hostname. Some drivers use `Servername` as the name for this argument. Not required when configured for the supplied `dsn`.

`database` The database on the server. Not required when configured for the supplied `dsn`.

`uid` The user identifier. Some drivers use `username` as the name for this argument. Not required when configured for the supplied `dsn`.

`pwd` The password. Some drivers use `password` as the name for this argument. Not required when configured for the supplied `dsn`.

`dbms.name` The database management system name. This should normally be queried automatically by the ODBC driver. This name is used as the class name for the OdbcConnection object returned from `dbConnect()`. However, if the driver does not return a valid value, it can be set manually with this parameter.

`attributes` An S4 object of connection attributes that are passed prior to the connection being established. See ConnectionAttributes.

`.connection_string`
A complete connection string, useful if you are copy pasting it from another source. If this argument is used, any additional arguments will be appended to this string.

Connection strings

Internally, `dbConnect()` creates a connection string using the supplied arguments. Connection string keywords are driver-dependent; the arguments documented here are common, but some drivers may not accept them.

Alternatively to configuring DSNs and driver names with the driver manager, you can pass a complete connection string directly as the `.connection_string` argument. The Connection Strings Reference is a useful resource that has example connection strings for a large variety of databases.

Overview

The odbc package is one piece of the R interface to databases with support for ODBC:

The package supports any **Database Management System (DBMS)** with ODBC support. Support for a given DBMS is provided by an **ODBC driver**, which defines how to interact with that DBMS using the standardized syntax of ODBC and SQL. Drivers can be downloaded from the DBMS vendor or, if you're a Posit customer, using the professional drivers. To manage information about each driver and the data sources they provide access to, our computers use a **driver manager**. Windows is bundled with a driver manager, while MacOS and Linux require installation of one; this package supports the unixODBC driver manager.

In the **R interface**, the DBI package provides a front-end while odbc implements a back-end to communicate with the driver manager. The odbc package is built on top of the nanodbc C++ library.

Interfacing with DBMSs using R and odbc involves three high-level steps:

1. *Configure drivers and data sources*: the functions `odbcListDrivers()` and `odbcListDataSources()` help to interface with the driver manager.
2. *Connect to a database*: The `dbConnect()` function, called with the first argument odbc(), connects to a database using the specified ODBC driver to create a connection object.
3. *Interface with connections*: The resulting connection object can be passed to various functions to retrieve information on database structure (`dbListTables()`), iteratively develop queries (`dbSendQuery()`, `dbColumnInfo()`), and query data objects (`dbFetch()`).

Learn more

To learn more about databases:

- "Best Practices in Working with Databases" documents how to use the odbc package with various popular databases.
- The pyodbc "Drivers and Driver Managers" Wiki provides further context on drivers and driver managers.
- Microsoft's "Introduction to ODBC" is a thorough resource on the ODBC interface.

`odbcConnectionCatalogs` *odbcConnectionCatalogs*

Description

This function returns a listing of available catalogs.

Usage

```
odbcConnectionCatalogs(conn)

## S4 method for signature 'OdbcConnection'
odbcConnectionCatalogs(conn)
```

Arguments

conn	OdbcConnection

odbcConnectionColumns *odbcConnectionColumns*

Description

For a given table this function returns detailed information on all fields / columns. The expectation is that this is a relatively thin wrapper around the ODBC SQLColumns function call, with some of the field names renamed / re-ordered according to the return specifications below.

Usage

```
odbcConnectionColumns(conn, name, ..., exact = FALSE)

## S4 method for signature 'OdbcConnection,Id'
odbcConnectionColumns(conn, name, ..., column_name = NULL, exact = FALSE)

## S4 method for signature 'OdbcConnection,character'
odbcConnectionColumns(
  conn,
  name,
  ...,
  catalog_name = NULL,
  schema_name = NULL,
  column_name = NULL,
  exact = FALSE
)

## S4 method for signature 'OdbcConnection,SQL'
odbcConnectionColumns(conn, name, ..., exact = FALSE)
```

Arguments

conn	OdbcConnection
name, catalog_name, schema_name	Catalog, schema, and table identifiers. By default, are interpreted as a ODBC search pattern where _ and % are wild cards. Set exact = TRUE to match _ exactly.
...	additional parameters to methods
exact	Set to TRUE to escape _ in identifier names so that it matches exactly, rather than matching any single character. % always matches any number of characters as this is unlikely to appear in a table name.
column_name	The name of the column to return, the default returns all columns.

Details

In dbWriteTable() we make a call to this method to get details on the fields of the table we are writing to. In particular the columns data_type, column_size, and decimal_digits are used. An implementation is not necessary for dbWriteTable() to work.

odbcConnectionColumns is routed through the SQLColumns ODBC method. This function, together with remaining catalog functions (SQLTables, etc), by default (SQL_ATTR_METADATA_ID ==

`false`) expect either ordinary arguments (OA) in the case of the catalog, or pattern value arguments (PV) in the case of schema/table name. For these, quoted identifiers do not make sense, so we unquote identifiers prior to the call.

Value

data.frame with columns

- name
- field.type - equivalent to type_name in SQLColumns output
- table_name
- schema_name
- catalog_name
- data_type
- column_size
- buffer_length
- decimal_digits
- numeric_precision_radix
- remarks
- column_default
- sql_data_type
- sql_datetime_subtype
- char_octet_length
- ordinal_position
- nullable

See Also

The ODBC documentation on SQLColumns for further details.

The ODBC documentation on Arguments to catalog functions.

`odbcConnectionTables` *odbcConnectionTables*

Description

This function returns a listing of tables accessible to the connected user. The expectation is that this is a relatively thin wrapper around the ODBC `SQLTables` function call, albeit returning a subset of the fields.

Usage

```
odbcConnectionTables(conn, name, ...)

## S4 method for signature 'OdbcConnection,Id'
odbcConnectionTables(conn, name, table_type = NULL, exact = FALSE)

## S4 method for signature 'OdbcConnection,character'
odbcConnectionTables(
  conn,
  name,
  catalog_name = NULL,
  schema_name = NULL,
  table_type = NULL,
  exact = FALSE
)

## S4 method for signature 'OdbcConnection,ANY'
odbcConnectionTables(
  conn,
  name = NULL,
  catalog_name = NULL,
  schema_name = NULL,
  table_type = NULL,
  exact = FALSE
)

## S4 method for signature 'OdbcConnection,SQL'
odbcConnectionTables(conn, name, table_type = NULL, exact = FALSE)
```

Arguments

conn	OdbcConnection
name, catalog_name, schema_name	Catalog, schema, and table identifiers. By default, are interpreted as a ODBC search pattern where _ and % are wild cards. Set exact = TRUE to match _ exactly.
...	additional parameters to methods
table_type	List tables of this type, for example 'VIEW'. See odbcConnectionTableTypes for a listing of available table types for your connection.
exact	Set to TRUE to escape _ in identifier names so that it matches exactly, rather than matching any single character. % always matches any number of characters as this is unlikely to appear in a table name.

Details

It is important to note that, similar to the ODBC/API call, this method also accomodates pattern-value arguments for the catalog, schema, and table name arguments.

If extending this method, be aware that package:odbc internally uses this method to satisfy both DBI::dbListTables and DBI::dbExistsTable methods. (The former also advertises pattern value arguments)

Value

data.frame with columns

- table_catalog
- table_schema
- table_name
- table_remarks

See Also

The ODBC documentation on SQLTables for further details.

---

odbcConnectionTableTypes *odbcConnectionTableTypes*

Description

This function returns a listing of table types available in database.

Usage

```
odbcConnectionTableTypes(conn)

## S4 method for signature 'OdbcConnection'
odbcConnectionTableTypes(conn)
```

Arguments

conn	OdbcConnection

---

odbcDataType *Return the corresponding ODBC data type for an R object*

Description

This is used when creating a new table with `dbWriteTable()`. Databases with default methods defined are

- MySQL
- PostgreSQL
- SQL Server
- Oracle
- SQLite
- Spark
- Hive
- Impala

- Redshift
- Vertica
- BigQuery
- Teradata
- Access

Usage

```
odbcDataType(con, obj, ...)
```

Arguments

con	A driver connection object, as returned by dbConnect().
obj	An R object.
...	Additional arguments passed to methods.

Details

If you are using a different database and dbWriteTable() fails with a SQL parsing error the default method is not appropriate, you will need to write a new method.

Value

Corresponding SQL type for the obj.

Defining a new dbDataType method

The object type for your connection will be the database name retrieved by dbGetInfo(con)$dbms.name. Use the documentation provided with your database to determine appropriate values for each R data type. An example method definition of a fictional foo database follows.

```
con <- dbConnect(odbc::odbc(), "FooConnection")
dbGetInfo(con)$dbms.name
#> [1] "foo"

`odbcDataType.foo <- function(con, obj, ...) {
  switch_type(obj,
    factor = "VARCHAR(255)",
    datetime = "TIMESTAMP",
    date = "DATE",
    binary = "BINARY",
    integer = "INTEGER",
    double = "DOUBLE",
    character = "VARCHAR(255)",
    logical = "BIT",
    list = "VARCHAR(255)",
    stop("Unsupported type", call. = FALSE)
  )
}
```

odbcListColumns *List columns in an object.*

Description

Lists the names and types of each column (field) of a specified object.

Usage

```
odbcListColumns(connection, ...)
```

Arguments

connection	A connection object, as returned by dbConnect().
...	Parameters specifying the object.

Details

The object to inspect must be specified as one of the arguments (e.g. table = "employees"); depending on the driver and underlying data store, additional specification arguments may be required.

Value

A data frame with name and type columns, listing the object's fields.

odbcListDataSources *List Configured Data Source Names*

Description

Collect information about the available data source names (DSNs). A DSN must be both installed and configured with the driver manager to be included in this list. Configuring a DSN just sets up a lookup table (e.g. in odbc.ini) to allow users to pass only the DSN to dbConnect().

DSNs that are not configured with the driver manager can still be connected to with dbConnect() by providing DSN metadata directly.

Usage

```
odbcListDataSources()
```

Value

A data frame with two columns:

name Name of the data source. The entries in this column can be passed to the dsn argument of dbConnect().

description Data source description.

Configuration

This function interfaces with the driver manager to collect information about the available data source names.

For **MacOS and Linux**, the odbc package supports the unixODBC driver manager. unixODBC looks to the `odbc.ini` *configuration file* for information on DSNs. Find the location(s) of your `odbc.ini` file(s) with `odbcinst -j`.

In this example `odbc.ini` file:

```
[MySQL]
Driver = MySQL Driver
Database = test
Server = 127.0.0.1
User = root
password = root
Port = 3306
```

...the data source name is `MySQL`, which will appear in the `name` column of this function's output. To pass the DSN as the `dsn` argument to `dbConnect()`, pass it as a string, like `"MySQL"`. `Driver = MySQL Driver` references the driver `name` in `odbcListDrivers()` output.

Windows is bundled with an ODBC driver manager.

When a DSN is configured with a driver manager, information on the DSN will be automatically passed on to `dbConnect()` when its `dsn` argument is set.

For example, with the `MySQL` data source name configured, and the driver name `MySQL Driver` appearing in `odbcListDrivers()` output, the code:

```
con <-
  dbConnect(
    odbc::odbc(),
    Driver = "MySQL Driver",
    Database = "test",
    Server = "127.0.0.1",
    User = "root",
    password = "root",
    Port = 3306
  )
```

...can be written:

```
con <- dbConnect(odbc::odbc(), dsn = "MySQL")
```

In this case, `dbConnect()` will look up the information defined for `MySQL` in the driver manager (in our example, `odbc.ini`) and automatically pass the needed arguments.

See Also

`odbcListDrivers()`

`odbcListDrivers` *List Configured ODBC Drivers*

Description

Collect information about the configured driver names. A driver must be both installed and configured with the driver manager to be included in this list. Configuring a driver name just sets up a lookup table (e.g. in `odbcinst.ini`) to allow users to pass only the driver name to `dbConnect()`.

Driver names that are not configured with the driver manager (and thus do not appear in this function's output) can still be used in `dbConnect()` by providing a path to a driver directly.

Usage

```
odbcListDrivers(
  keep = getOption("odbc.drivers_keep"),
  filter = getOption("odbc.drivers_filter")
)
```

Arguments

`keep, filter`	A character vector of driver names to keep in or remove from the results, respectively. If `NULL`, all driver names will be kept, or none will be removed, respectively. The `odbc.drivers_keep` and `odbc.drivers_filter` options control the argument defaults. Driver names are first processed with `keep`, then `filter`. Thus, if a driver name is in both `keep` and `filter`, it won't appear in output.

Value

A data frame with three columns.

name Name of the driver. The entries in this column can be passed to the `driver` argument of `dbConnect()` (as long as the driver accepts the argument).

attribute Driver attribute name.

value Driver attribute value.

If a driver has multiple attributes, there will be one row per attribute, each with the same driver `name`. If a given driver name does not have any attributes, the function will return one row with the driver `name`, but the last two columns will be `NA`.

Configuration

This function interfaces with the driver manager to collect information about the available driver names.

For **MacOS and Linux**, the odbc package supports the unixODBC driver manager. unixODBC looks to the `odbcinst.ini` *configuration file* for information on driver names. Find the location(s) of your `odbcinst.ini` file(s) with `odbcinst -j`.

In this example `odbcinst.ini` file:

```
[MySQL Driver]
Driver=/opt/homebrew/Cellar/mysql/8.2.0_1/lib/libmysqlclient.dylib
```

Then the driver name is `MySQL Driver`, which will appear in the `name` column of this function's output. To pass the driver name as the `driver` argument to `dbConnect()`, pass it as a string, like `"MySQL Driver"`.

Windows is bundled with an ODBC driver manager.

In this example, function output would include 1 row: the `name` column would read `"MySQL Driver"`, `attribute` would be `"Driver"`, and `value` would give the file path to the driver. Additional key-value pairs under the driver name would add additional rows with the same `name` entry.

When a driver is configured with a driver manager, information on the driver will be automatically passed on to `dbConnect()` when its `driver` argument is set. For an example, see the same section in the `odbcListDataSources()` help-file. Instead of configuring driver information with a driver manager, it is also possible to provide a path to a driver directly to `dbConnect()`.

See Also

`odbcListDataSources()`

Examples

```
odbcListDrivers()
```

`odbcListObjects` *List objects in a connection.*

Description

Lists all of the objects in the connection, or all the objects which have specific attributes.

Usage

```
odbcListObjects(connection, ...)
```

Arguments

`connection`	A connection object, as returned by `dbConnect()`.
`...`	Attributes to filter by.

Details

When used without parameters, this function returns all of the objects known by the connection. Any parameters passed will filter the list to only objects which have the given attributes; for instance, passing `schema = "foo"` will return only objects matching the schema `foo`.

Value

A data frame with `name` and `type` columns, listing the objects.

odbcListObjectTypes *Return the object hierarchy supported by a connection.*

Description

Lists the object types and metadata known by the connection, and how those object types relate to each other.

Usage

```
odbcListObjectTypes(connection)
```

Arguments

connection	A connection object, as returned by dbConnect().

Details

The returned hierarchy takes the form of a nested list, in which each object type supported by the connection is a named list with the following attributes:

contains A list of other object types contained by the object, or "data" if the object contains data

icon An optional path to an icon representing the type

For instance, a connection in which the top-level object is a schema that contains tables and views, the function will return a list like the following:

```
list(schema = list(contains = list(
                  list(name = "table", contains = "data")
                  list(name = "view", contains = "data"))))
```

Value

The hierarchy of object types supported by the connection.

odbcPreviewObject *Preview the data in an object.*

Description

Return the data inside an object as a data frame.

Usage

```
odbcPreviewObject(connection, rowLimit, ...)
```

Arguments

connection	A connection object, as returned by dbConnect().
rowLimit	The maximum number of rows to display.
...	Parameters specifying the object.

Details

The object to previewed must be specified as one of the arguments (e.g. table = "employees"); depending on the driver and underlying data store, additional specification arguments may be required.

Value

A data frame containing the data in the object.

---

odbcSetTransactionIsolationLevel

Set the Transaction Isolation Level for a Connection

Description

Set the Transaction Isolation Level for a Connection

Usage

```
odbcSetTransactionIsolationLevel(conn, levels)
```

Arguments

conn	A DBIConnection object, as returned by dbConnect().
levels	One or more of 'read_uncommitted', 'read_committed', 'repeatable_read', 'serializable'.

See Also

https://docs.microsoft.com/en-us/sql/odbc/reference/develop-app/setting-the-transaction-isolati

Examples

```
## Not run:
# Can use spaces or underscores in between words.
odbcSetTransactionIsolationLevel(con, "read uncommitted")

# Can also use the full constant name.
odbcSetTransactionIsolationLevel(con, "SQL_TXN_READ_UNCOMMITTED")

## End(Not run)
```

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