

Package ‘bulkreadr’

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Title The Ultimate Tool for Reading Data in Bulk

Version 1.2.0

Description Designed to simplify and streamline the process of reading and processing large volumes of data in R, this package offers a collection of functions tailored for bulk data operations. It enables users to efficiently read multiple sheets from Microsoft Excel and Google Sheets workbooks, as well as various CSV files from a directory. The data is returned as organized data frames, facilitating further analysis and manipulation. Ideal for handling extensive data sets or batch processing tasks, bulkreadr empowers users to manage data in bulk effortlessly, saving time and effort in data preparation workflows. Additionally, the package seamlessly works with labelled data from SPSS and Stata.

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URL <https://github.com/gbganalyst/bulkreadr>,
<https://gbganalyst.github.io/bulkreadr/>

BugReports <https://github.com/gbganalyst/bulkreadr/issues>

Depends purrr

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Contents

convert_to_date	2
fill_missing_values	3
generate_dictionary	4
inspect_na	6
look_for	7
pull_out	8
read_csv_files_from_dir	8
read_excel_files_from_dir	10
read_excel_workbook	11
read_gsheets	12
read_spss_data	13
read_stata_data	14
write_excel_sheets_to_csv	15

Index **16**

convert_to_date	<i>User friendly date parsing function</i>
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Description

convert_to_date() parses an input vector into POSIXct date object. It is also powerful to convert from excel date number like 42370 into date value like 2016-01-01.

Usage

```
convert_to_date(date_num_char, tz = "UTC")
```

Arguments

date_num_char	A character or numeric vector of dates
tz	Time zone indicator. If NULL (default), a Date object is returned. Otherwise a POSIXct with time zone attribute set to tz.

Value

a vector of class Date

Examples

```
## ** heterogeneous dates **

dates <- c(
  44869, "22.09.2022", NA, "02/27/92", "01-19-2022",
  "13-01- 2022", "2023", "2023-2", 41750.2, 41751.99,
  "11 07 2023", "2023-4"
)

convert_to_date(dates)
```

fill_missing_values *Fill missing values in a data frame*

Description

fill_missing_values() is an efficient function that addresses missing values in a data frame. It uses imputation by function, also known as column-based imputation, to impute the missing values. For continuous variables, it supports various methods of imputation, including minimum, maximum, mean, median, harmonic mean, and geometric mean. For categorical variables, missing values are replaced with the mode of the column. This approach ensures accurate and consistent replacements derived from individual columns, resulting in a complete and reliable dataset for improved analysis and decision-making.

Usage

```
fill_missing_values(
  df,
  selected_variables = NULL,
  method = c("mean", "min", "max", "median", "harmonic", "geometric")
)
```

Arguments

df	A dataframe to process for missing value imputation.
selected_variables	An optional vector of variable names within df for which missing values should be imputed. If NULL (default), imputation is applied to all variables in the data frame. Variables must be quoted.
method	A character string specifying the imputation method for continuous variables. Supported methods are "min", "max", "mean", "median", "harmonic", and "geometric". The default method is "mean". For categorical variables, the mode is always used.

Value

A data frame with missing values imputed according to the specified method.

Examples

```

library(dplyr)

# Assuming 'df' is the dataframe you want to process

df <- tibble::tibble(
  Sepal_Length = c(5.2, 5, 5.7, NA, 6.2, 6.7, 5.5),
  Petal_Length = c(1.5, 1.4, 4.2, 1.4, NA, 5.8, 3.7),
  Petal_Width = c(NA, 0.2, 1.2, 0.2, 1.3, 1.8, NA),
  Species = c("setosa", NA, "versicolor", "setosa",
              NA, "virginica", "setosa")
)

# Impute using the mean method for continuous variables

result_df_mean <- fill_missing_values(df, method = "mean")

result_df_mean

# Impute using the geometric mean for continuous variables and specify
# variables `Petal_Length` and `Petal_Width`.

result_df_geomean <- fill_missing_values(df, selected_variables = c
("Petal_Length", "Petal_Width"), method = "geometric")

result_df_geomean

# Impute missing values (NAs) in a grouped data frame

# You can do that by using the following:

sample_iris <- tibble::tibble(
  Sepal_Length = c(5.2, 5, 5.7, NA, 6.2, 6.7, 5.5),
  Petal_Length = c(1.5, 1.4, 4.2, 1.4, NA, 5.8, 3.7),
  Petal_Width = c(0.3, 0.2, 1.2, 0.2, 1.3, 1.8, NA),
  Species = c("setosa", "setosa", "versicolor", "setosa",
              "virginica", "virginica", "setosa")
)

sample_iris %>%
  group_by(Species) %>%
  group_split() %>%
  map_df(fill_missing_values, method = "median")

```

Description

`generate_dictionary()` creates a data dictionary from a specified data frame. This function is particularly useful for understanding and documenting the structure of your dataset, similar to data dictionaries in Stata or SPSS.

Usage

```
generate_dictionary(data)
```

Arguments

`data` a data frame or a survey object

Details

The function returns a tibble (a modern version of R's data frame) with the following columns:

- **position:** An integer vector indicating the column position in the data frame.
- **variable:** A character vector containing the names of the variables (columns).
- **description:** A character vector with a human-readable description of each variable.
- **column type:** A character vector specifying the data type (e.g., numeric, character) of each variable.
- **missing:** An integer vector indicating the count of missing values for each variable.
- **levels:** A list vector containing the levels for categorical variables, if applicable.

Value

A tibble representing the data dictionary. Each row corresponds to a variable in the original data frame, providing detailed information about the variable's characteristics.

Examples

```
# Creating a data dictionary from an SPSS file

file_path <- system.file("extdata", "Wages.sav", package = "bulkreadr")

wage_data <- read_spss_data(file = file_path)

generate_dictionary(wage_data)
```

`inspect_na`*Summarize missingness in data frame columns*

Description

`inspect_na()` summarizes the rate of missingness in each column of a data frame. For a grouped data frame, the rate of missingness is summarized separately for each group.

Usage

```
inspect_na(df)
```

Arguments

`df` A data frame

Details

The tibble returned contains the columns:

- **col_name**, a character vector containing column names of `df1`.
- **cnt**, an integer vector containing the number of missing values by column.
- **pcnt**, the percentage of records in each columns that is missing.

Value

A tibble summarizing the count and percentage of columnwise missingness for a data frame.

Examples

```
library(dplyr)

# dataframe summary

inspect_na(airquality)

# grouped dataframe summary

airquality %>%
  group_by(Month) %>%
  inspect_na()
```

Description

The `look_for()` function is designed to emulate the functionality of the Stata `lookfor` command in R. It provides a powerful tool for searching through large datasets, specifically targeting variable names, variable label descriptions, factor levels, and value labels. This function is handy for users working with extensive and complex datasets, enabling them to quickly and efficiently locate the variables of interest.

Usage

```
look_for(  
  data,  
  ...,  
  labels = TRUE,  
  values = TRUE,  
  ignore.case = TRUE,  
  details = c("basic", "none", "full")  
)
```

Arguments

<code>data</code>	a data frame or a survey object
<code>...</code>	optional list of keywords, a character string (or several character strings), which can be formatted as a regular expression suitable for a <code>base::grep()</code> pattern, or a vector of keywords; displays all variables if not specified
<code>labels</code>	whether or not to search variable labels (descriptions); TRUE by default
<code>values</code>	whether or not to search within values (factor levels or value labels); TRUE by default
<code>ignore.case</code>	whether or not to make the keywords case sensitive; TRUE by default (case is ignored during matching)
<code>details</code>	add details about each variable (full details could be time consuming for big data frames, FALSE is equivalent to "none" and TRUE to "full")

Value

A tibble data frame featuring the variable position, name and description (if it exists) in the original data frame.

Examples

```
look_for(iris)  
  
# Look for a single keyword.
```

```
look_for(iris, "petal")  
look_for(iris, "s")
```

pull_out

Extract or replace parts of an object

Description

pull_out() is similar to [. It acts on vectors, matrices, arrays and lists to extract or replace parts. It is pleasant to use with the magrittr (%>%) and base (|>) operators.

Value

pull_out() will return an object of the same class as the input object.

Examples

```
good_choice <- letters %>%  
  pull_out(c(5, 2, 1, 4))  
  
good_choice  
  
iris %>%  
  pull_out(, 1:4) %>%  
  head()
```

read_csv_files_from_dir

Reads all CSV files from a directory

Description

read_csv_files_from_dir reads all csv files from the "~/data" directory and returns an appended dataframe. The resulting dataframe will be in the same order as the CSV files in the directory.

Usage

```
read_csv_files_from_dir(dir_path = ".", col_types = NULL, .id = NULL)
```


Arguments

<code>dir_path</code>	Path to the directory containing the CSV files.
<code>col_types</code>	<p>One of NULL, a <code>cols()</code> specification, or a string. See <code>vignette("readr")</code> for more details.</p> <p>If NULL, all column types will be inferred from <code>guess_max</code> rows of the input, interspersed throughout the file. This is convenient (and fast), but not robust. If the guessed types are wrong, you'll need to increase <code>guess_max</code> or supply the correct types yourself.</p> <p>Column specifications created by <code>list()</code> or <code>cols()</code> must contain one column specification for each column. If you only want to read a subset of the columns, use <code>cols_only()</code>.</p> <p>Alternatively, you can use a compact string representation where each character represents one column:</p> <ul style="list-style-type: none"> • c = character • i = integer • n = number • d = double • l = logical • f = factor • D = date • T = date time • t = time • ? = guess • _ or - = skip <p>By default, reading a file without a column specification will print a message showing what <code>readr</code> guessed they were. To remove this message, set <code>show_col_types = FALSE</code> or set <code>options(readr.show_col_types = FALSE)</code>.</p>
<code>.id</code>	The name of a column in which to store the file path. This is useful when reading multiple input files and there is data in the file paths, such as the data collection date. If NULL (the default) no extra column is created.

Value

A [tibble](#). If there is any column type mismatch during data frames row binding, an error will occur. This is because R cannot combine columns of different types. For example, you cannot combine a column of integers with a column of characters.

See Also

[read_excel_files_from_dir\(\)](#) which reads Excel workbooks data from a directory.

Examples

```
directory <- system.file("csvfolder", package = "bulkreadr")
read_csv_files_from_dir(dir_path = directory, .id = "cut")
```

```
# Column types mismatch error -----
# If the `read_csv_files_from_dir()` function complains about a data type mismatch,
# then set the `col_types` argument to `"c"`.
# This will make all the column types in the resulting dataframe be characters.
```

read_excel_files_from_dir

Read Excel Workbooks data from a directory

Description

read_excel_files_from_dir() reads all Excel workbooks in the "~/data" directory and returns an appended dataframe.

Usage

```
read_excel_files_from_dir(dir_path, col_types = NULL, .id = NULL)
```

Arguments

dir_path	Path to the directory containing the xls/xlsx files.
col_types	Either NULL to guess all from the spreadsheet or a character vector containing one entry per column from these options: "skip", "guess", "logical", "numeric", "date", "text" or "list". If exactly one col_type is specified, it will be recycled. The content of a cell in a skipped column is never read and that column will not appear in the data frame output. A list cell loads a column as a list of length 1 vectors, which are typed using the type guessing logic from col_types = NULL, but on a cell-by-cell basis.
.id	The name of an optional identifier column. Provide a string to create an output column that identifies each input. The column will use names if available, otherwise it will use positions.

Value

A [tibble](#). If there is any column type mismatch during data frames row binding, an error will occur. This is because R cannot combine columns of different types. For example, you cannot combine a column of integers with a column of characters.

See Also

[read_excel_workbook\(\)](#) which imports data from multiple sheets of an Excel workbook

Examples

```

directory <- system.file("xlsxfolder", package = "bulkreadr")

read_excel_files_from_dir(dir_path = directory, .id = "cut")

# Column types mismatch error -----
# If the `read_excel_files_from_dir()` function complains about a data type mismatch,
# then set the `col_types` argument to `"text"`.
# This will make all the column types in the resulting dataframe be characters.

```

read_excel_workbook *Import data from multiple sheets of an Excel workbook*

Description

read_excel_workbook() reads all the data from the sheets of an Excel workbook and return an appended dataframe.

Usage

```
read_excel_workbook(path, col_types = NULL, .id = NULL)
```

Arguments

path	Path to the xls/xlsx file.
col_types	Either NULL to guess all from the spreadsheet or a character vector containing one entry per column from these options: "skip", "guess", "logical", "numeric", "date", "text" or "list". If exactly one col_type is specified, it will be recycled. The content of a cell in a skipped column is never read and that column will not appear in the data frame output. A list cell loads a column as a list of length 1 vectors, which are typed using the type guessing logic from col_types = NULL, but on a cell-by-cell basis.
.id	The name of an optional identifier column. Provide a string to create an output column that identifies each input. The column will use names if available, otherwise it will use positions.

Value

A **tibble**. If there is any column type mismatch during data frames row binding, an error will occur. This is because R cannot combine columns of different types. For example, you cannot combine a column of integers with a column of characters.

See Also

[readxl::read_excel\(\)](#), which reads a Sheet of an Excel file into a data frame, and [read_gsheets\(\)](#), which imports data from multiple sheets in a Google Sheets.

Examples

```
path <- system.file("extdata", "Diamonds.xlsx", package = "bulkreadr", mustWork = TRUE)

read_excel_workbook(path = path, .id = "Year")

# Column types mismatch error -----
# If the `read_excel_workbook()` function complains about a data type mismatch,
# then set the `col_types` argument to `"text"`.
# This will make all the column types in the resulting DataFrame be characters.
```

read_gsheets

*Import data from multiple sheets in Google Sheets***Description**

The `read_gsheets()` function imports data from multiple sheets in a Google Sheets spreadsheet and appends the resulting dataframes from each sheet together to create a single dataframe. This function is a powerful tool for data analysis, as it allows you to easily combine data from multiple sheets into a single dataset.

Usage

```
read_gsheets(ss, col_types = NULL, .id = NULL)
```

Arguments

<code>ss</code>	<p>Something that identifies a Google Sheet:</p> <ul style="list-style-type: none"> • its file id as a string or <code>drive_id</code> • a URL from which we can recover the id • a one-row <code>dribble</code>, which is how googledrive represents Drive files • an instance of <code>googlesheets4_spreadsheet</code>, which is what <code>gs4_get()</code> returns <p>Processed through <code>as_sheets_id()</code>.</p>
<code>col_types</code>	<p>Column types. Either NULL to guess all from the spreadsheet or a string of readr-style shortcodes, with one character or code per column. If exactly one <code>col_type</code> is specified, it is recycled. See Column Specification for more.</p>
<code>.id</code>	<p>The name of an optional identifier column. Provide a string to create an output column that identifies each input. The column will use names if available, otherwise it will use positions.</p>

Value

A [tibble](#). If there is any column type mismatch during data frames row binding, an error will occur. This is because R cannot combine columns of different types. For example, you cannot combine a column of integers with a column of characters.

See Also

[googlesheets4::read_sheet\(\)](#) which reads a Google (spread)Sheet into a data frame.

Examples

```
sheet_id <- "1iz00mHu3L9AMySQUXGDn9GPs1n-VwGFSEoAKGhqVQh0"

read_gsheets(ss = sheet_id, .id = "sheet.name")

# Column types mismatch error -----
# If the `read_gsheets()` function complains about a data type mismatch,
# then set the `col_types` argument to `c`.
# This will make all the column types in the resulting dataframe be characters.

# For example,

sheet_id <- "1rrjKAV05P0re9lDvtHtZePTa8VR0f1onV047cHnhrTU"

try(read_gsheets(ss = sheet_id)) # error, column types mismatch

read_gsheets(ss = sheet_id, col_types = "c")
```

read_spss_data	<i>Read SPSS data file</i>
----------------	----------------------------

Description

`read_spss_data()` is designed to seamlessly import data from an SPSS data (.sav or .zsav) files. It converts labelled variables into factors, a crucial step that enhances the ease of data manipulation and analysis within the R programming environment.

Usage

```
read_spss_data(file, label = FALSE)
```

Arguments

file	The path to the SPSS data file.
label	Logical indicating whether to use variable labels as column names (default is FALSE).

Value

A tibble containing the data from the SPSS file.

See Also

[read_stata_data\(\)](#) which reads Stata data file and converts labelled variables into factors.

Examples

```
# Read an SPSS data file without converting variable labels as column names
file_path <- system.file("extdata", "Wages.sav", package = "bulkreadr")

data <- read_spss_data(file = file_path)

data

# Read an SPSS data file and convert variable labels as column names
data <- read_spss_data(file = file_path, label = TRUE)

data
```

read_stata_data	<i>Read Stata data file</i>
-----------------	-----------------------------

Description

Read Stata data file

Usage

```
read_stata_data(file, label = FALSE)
```

Arguments

file	The path to the Stata data file.
label	Logical indicating whether to use variable labels as column names (default is FALSE).

Value

A data frame containing the Stata data, with labeled variables converted to factors.

See Also

[read_spss_data\(\)](#) which reads SPSS data file and converts labelled variables into factors.

Examples

```
# Read Stata data file without converting variable labels as column names
file_path <- system.file("extdata", "Wages.dta", package = "bulkreadr")

data <- read_stata_data(file = file_path)

data

# Read Stata data file and convert variable labels as column names

data <- read_stata_data(file = file_path, label = TRUE)

data
```

```
write_excel_sheets_to_csv
```

Export Excel Sheets to CSV Files

Description

This function reads an Excel file, converts each sheet into a data frame, and writes each sheet to a CSV file in the specified output directory.

Usage

```
write_excel_sheets_to_csv(excel_path, output_dir = "data/")
```

Arguments

excel_path	A character string specifying the path to the Excel file.
output_dir	A character string specifying the directory where CSV files will be saved. Defaults to "data/".

Value

A list of file paths corresponding to the exported CSV files.

Examples

```
# Path to the example Excel file shipped with the package
excel_file <- system.file("extdata", "Diamonds.xlsx", package = "bulkreadr")

# Export each sheet to its own CSV in a temporary directory
output_dir <- tempdir()
write_excel_sheets_to_csv(excel_file, output_dir)
```

Index

`as_sheets_id()`, [12](#)

`base::grep()`, [7](#)

`cols()`, [9](#)
`cols_only()`, [9](#)
`convert_to_date`, [2](#)

`dribble`, [12](#)
`drive_id`, [12](#)

`fill_missing_values`, [3](#)

`generate_dictionary`, [4](#)
`googlesheets4::read_sheet()`, [13](#)
`gs4_get()`, [12](#)

`inspect_na`, [6](#)

`list()`, [9](#)
`look_for`, [7](#)

`pull_out`, [8](#)

`read_csv_files_from_dir`, [8](#)
`read_excel_files_from_dir`, [10](#)
`read_excel_files_from_dir()`, [9](#)
`read_excel_workbook`, [11](#)
`read_excel_workbook()`, [10](#)
`read_gsheets`, [12](#)
`read_gsheets()`, [11](#)
`read_spss_data`, [13](#)
`read_spss_data()`, [14](#)
`read_stata_data`, [14](#)
`read_stata_data()`, [14](#)
`readxl::read_excel()`, [11](#)

`tibble`, [9–12](#)

`write_excel_sheets_to_csv`, [15](#)