Package ‘assertable’

January 27, 2021

Type Package

Title Verbose Assertions for Tabular Data (Data.frames and Data.tables)

Version 0.2.8

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Description Simple, flexible, assertions on data.frame or data.table objects with verbose output for vetting. While other assertion packages apply towards more general use-cases, assertable is tailored towards tabular data. It includes functions to check variable names and values, whether the dataset contains all combinations of a given set of unique identifiers, and whether it is a certain length. In addition, assertable includes utility functions to check the existence of target files and to efficiently import multiple tabular data files into one data.table.

Depends R (>= 3.1.0)

Imports data.table, parallel

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 6.1.1

Suggests knitr, rmarkdown

VignetteBuilder knitr

NeedsCompilation no

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Repository CRAN

Date/Publication 2021-01-27 06:30:15 UTC

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assert_colnames

Assert that a data.frame contains specified column names

Description

Given a data.frame or data.table object, assert that all columns in the colnames argument exist as columns.

Usage

assert_colnames(data, colnames, only_colnames = TRUE, quiet = FALSE)

Arguments

data A data.frame or data.table

colnames Character vector with column names corresponding to columns in data

only_colnames Assert that the only columns in the data object should be those in colnames. Default = T.

quiet Do you want to suppress the printed message when a test is passed? Default = F.

Value

Throws error if test is violated.

Examples

assert_colnames(CO2, c("Plant","Type","Treatment","conc","uptake"))
assert_colnames(CO2, c("Plant","Type"), only_colnames=FALSE)
assert_coltypes

**Assert that a data.frame’s columns are certain types**

**Description**

Given a data.frame or data.table object, assert that all columns in the names of the coltypes argument match the types of the elements of the coltypes argument.

**Usage**

`assert_coltypes(data, coltypes, quiet = FALSE)`

**Arguments**

- `data`: A data.frame or data.table
- `coltypes`: List with names corresponding to columns in `data`. The types of the columns in `data` will be tested against types of the elements in `coltypes`.
- `quiet`: Do you want to suppress the printed message when a test is passed? Default = F.

**Value**

Throws error if test is violated.

**Examples**

```
# Should pass
assert_coltypes(CO2, list(Plant = integer(), conc = double()))
# Should fail
## Not run:
assert_coltypes(CO2, list(Plant = character(), conc = character()))
## End(Not run)
```

---

assert_ids

**Assert that a data.frame contains all unique combinations of specified ID variables, and doesn’t contain duplicates within combinations**
**Description**

Given a data.frame or data.table object and a named list of id_vars, assert that all possible combinations of id_vars exist in the dataset, that no combinations of id_vars exist in the dataset but not in id_vars, and that there are no duplicate values within the dataset within unique combinations of id_vars.

If ids_only = T and assert_dups = T, returns all combinations of id_vars along with the n_duplicates: the count of duplicates within each combination. If ids_only = F, returns all duplicate observations from the original dataset along with n_duplicates and duplicate_id: a unique ID for each duplicate value within each combination of id_vars.

**Usage**

```r
assert_ids(data, id_vars, assert_combos = TRUE, assert_dups = TRUE,
           ids_only = TRUE, warn_only = FALSE, quiet = FALSE)
```

**Arguments**

- `data`: A data.frame or data.table
- `id_vars`: A named list of vectors, where the name of each vector must correspond to a column in `data`
- `assert_combos`: Assert that the data object must contain all combinations of `id_vars`. Default = T.
- `assert_dups`: Assert that the data object must not contain duplicate values within any combinations of `id_vars`. Default = T.
- `ids_only`: By default, with assert_dups = T, the function returns the unique combinations of id_vars that have duplicate observations. If ids_only = F, will return every observation in the original dataset that are duplicates.
- `warn_only`: Do you want to warn, rather than error? Will return all offending rows from the first violation of the assertion. Default=F.
- `quiet`: Do you want to suppress the printed message when a test is passed? Default = F.

**Details**

Note: if assert_combos = T and is violated, then assert_ids will stop execution and return results for assert_combos before evaluating the assert_dups segment of the code. If you want to make sure both options are evaluated even in case of a violation in assert_combos, call assert_ids twice (once with assert_dups = F, then assert_combos = F) with warn_only = T, and then conditionally stop your code if either call returns results.

**Value**

Throws error if test is violated. Will print the offending rows. If warn_only=T, will return all offending rows and only warn.
**assert_nrows**

**Examples**

```r
plants <- as.character(unique(CO2$Plant))
concs <- unique(CO2$conc)
ids <- list(Plant=plants, conc=concs)
assert_ids(CO2, ids)
```

---

**assert_nrows**

*Assert that a data.frame contains a specified number of rows*

**Description**

Given a data.frame or data.table object and a target number of rows, check that a dataset has that many rows.

**Usage**

```r
assert_nrows(data, target_nrows, quiet = FALSE)
```

**Arguments**

- `data`: A data.frame or data.table
- `target_nrows`: Numeric – number of expected rows
- `quiet`: Do you want to suppress the printed message when a test is passed? Default = F.

**Value**

Throws error if test is violated

**Examples**

```r
assert_nrows(CO2, 84)
```

---

**assert_values**

*Assert that a data.frame's columns are non-NA/infinite, or are greater, less than, equal/not-equal, or contain specified values.*

**Description**

Given a data.frame or data.table object, make assertions about values of the columns within the object. Assert that a column contains no missing/infinite values, or that it is greater/less than, equal to, or contains either a single value, vector with nrow(data) values, or a vector of any length (for in option).
Usage

assert_values(data, colnames, test = "not_na", test_val = NA, display_rows = TRUE, na.rm = FALSE, warn_only = FALSE, quiet = FALSE)

Arguments

data A data.frame or data.table

colnames Character vector with column names corresponding to columns in data

test The type of evaluation you want to assert in your data
  • not_na: All values must not be Na
  • not_nan: All values must not be NaN
  • not_inf: All values must not be infinite
  • lt: All values must be less than test_val
  • lte: All values must be less than or equal to test_val
  • gt: All values must be greater than test_val
  • gte: All values must be greater than or equal to test_val
  • equal: All values must be equal to test_val
  • not_equal: All values must not equal test_val
  • in: All values must be one of the values in test_val

test_val A single value, a vector with length = nrow(data), or a vector of any length (if using the in option for test. Must match the character type of colnames.

display_rows Do you want to show the actual rows that violate the assertion? Default=T

na.rm Do you want to remove NA and NaN values from assertions? Default=F

warn_only Do you want to warn, rather than error? Will return all offending rows from the first violation of the assertion Default=F

quiet Do you want to suppress the printed messages when a test is passed? Default = F.

Value

Throws error if test is violated. If warn_only=T, will return all offending rows from the first violation of the assertion.

Examples

assert_values(CO2, colnames="uptake", test="gt", 0) # Are all values greater than 0?
assert_values(CO2, colnames="conc", test="lte", 1000) # Are all values less than/equal to 1000?
## Not run:
assert_values(CO2, colnames="uptake", test="lt", 40) # Are all values less than 40?
# Fails: not all values < 40.
## End(Not run)
assert_values(CO2, colnames="Treatment", test="in", test_val = c("nonchilled","chilled"))
CO2_mult <- CO2
CO2_mult$new_uptake <- CO2_mult$uptake * 2
check_files

assert_values(CO2, colnames="uptake", test="equal", CO2_mult$new_uptake/2)
## Not run:
assert_values(CO2, colnames="uptake", test="gt", CO2_mult$new_uptake/2, display_rows=F)
# Fails: uptake !> new_uptake/2
## End(Not run)

---

check_files

Check for the existence of a vector of files, optionally repeated for a set amount of time.

**Description**

Given a character vector of filenames, check how many of them currently exist. Optionally, can keep checking for a specified amount of time, at a given frequency.

**Usage**

```r
check_files(filenames, folder = "", warn_only = FALSE, continual = FALSE, sleep_time = 30, sleep_end = (60 * 3), display_pct = 75)
```

**Arguments**

- `filenames`: A character vector of filenames (specify full paths if you are checking files that are not in present working directory).
- `folder`: An optional character containing the folder name that contains the files you want to check (if used, do not include folderpath in the filenames characters). If not specified, will search in present working directory.
- `warn_only`: Boolean (T/F), whether to end with a warning message as opposed to an error message if files are still missing at the end of the checks.
- `continual`: Boolean (T/F), whether to only run once or to continually keep checking for files for `sleep_end` minutes. Default = F.
- `sleep_time`: numeric (seconds); if `continual = T`, specify the number of seconds to wait in-between file checks. Default = 30 seconds.
- `sleep_end`: numeric (minutes); if `continual = T`, specify number of minutes to check at `sleep_time` intervals before terminating. Default = 180 minutes.
- `display_pct`: numeric (0-100); at what percentage of files found do you want to print the full list of still-missing files? Default = 75 percent of files.

**Value**

Prints the number of files that match. If `warn_only = T`, returns a character vector of missing files.
Examples

```r
## Not run:
for(i in 1:3) {
  data <- CO2
  data$id_var <- i
  write.csv(data, file=paste0("file_",i,".csv"),row.names=FALSE)
}
filenames <- paste0("file_",c(1:3),".csv")
check_files(filenames)
## End(Not run)
```

---

**import_files**  
_Given a vector of filenames, append all files and return as one data.table using a user-defined function_

---

**Description**

Given a character vector of filenames, check how many of them currently exist. Optionally, can keep checking for a specified amount of time, at a given frequency.

**Usage**

```r
import_files(filenames, folder = "", FUN = fread, warn_only = FALSE, 
multicore = FALSE, use.names = TRUE, fill = TRUE, 
mc.preschedule = FALSE, mc.cores = getOption("mc.cores", 2L), ...) 
```

**Arguments**

- `filenames`  
  A character vector of filenames (specify full paths if you are checking files that are not in present working directory)

- `folder`  
  An optional character containing the folder name that contains the files you want to check (if used, do not include folderpath in the filenames characters). If not specified, will look in present working directory.

- `FUN`  
  function: The function that you want to use to import your data, e.g. read.csv, fread, read_dta, etc.

- `warn_only`  
  Boolean (T/F), whether to send a warning message as opposed to an error message if files are missing prior to import. Will only import the files that do exist.

- `multicore`  
  boolean, use lapply or mclapply (multicore = T) to loop over files in filenames for import. Default=F.

- `use.names`  
  boolean, pass to the use.names option for rbindlist

- `fill`  
  boolean, pass to the fill option for rbindlist

- `mc.preschedule`  
  boolean, pass to the mc.preschedule option for mclapply if multicore = T. Default = F.

- `mc.cores`  
  pass to the mc.preschedule option for mclapply if multicore = T. Default = mclapply default.

- `...`  
  named arguments of FUN to pass to FUN
import_files

Value

One data.table that contains all files in filenames, combined together using rbindlist. Returns an error if any file in filenames does not exist.

Examples

```r
## Not run:
for(i in 1:3) {
  data <- CO2
  data$id_var <- i
  write.csv(data, file=paste0("file_", i, ",.csv"), row.names=FALSE)
}
filenames <- paste0("file_", c(1:3), ",.csv")
import_files(filenames, FUN=fread)
import_files(filenames, FUN=read.csv, stringsAsFactors=FALSE)
import_files(filenames, FUN=fread, multicore=T, mc.cores=1) # Only if you have a multi-core system

## End(Not run)
```
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