Package ‘disk.frame’

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Type Package

Title Larger-than-RAM Disk-Based Data Manipulation Framework

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Description A disk-based data manipulation tool for working with large-than-RAM datasets. Aims to lower the barrier-to-entry for manipulating large datasets by adhering closely to popular and familiar data manipulation paradigms like 'dplyr' verbs and 'data.table' syntax.

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Imports Rcpp (>= 0.12.13), glue (>= 1.3.1), future.apply (>= 1.3.0), fs (>= 1.3.1), jsonlite (>= 1.6), pryr (>= 0.1.4), stringr (>= 1.4.0), fst (>= 0.8.0), future (>= 1.14.0), data.table (>= 1.12.2), crayon (>= 1.3.4), bigreadr (>= 0.2.0), bit64, benchmarkme, purrr (>= 0.3.2), globals, rlang, arrow

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add_chunk

Add a chunk to the disk.frame

Description

If no chunk_id is specified, then the chunk is added at the end as the largest numbered file, "n.fst".

Usage

add_chunk(df, chunk, chunk_id = NULL, full.names = FALSE, ...)

Arguments

df              the disk.frame to add a chunk to
chunk           a data.frame to be added as a chunk
chunk_id        a numeric number indicating the id of the chunk. If NULL it will be set to the
                largest chunk_id + 1
full.names      whether the chunk_id name match should be to the full file path not just the file
                name
...             Passed in the write_fst. E.g. compress

Details

The function is the preferred way to add a chunk to a disk.frame. It performs checks on the types to
make sure that the new chunk doesn’t have different types to the disk.frame.

Value

disk.frame
Examples

```r
# create a disk.frame
df_path = file.path(tempdir(), "tmp_add_chunk")
diskf = disk.frame(df_path)

# add a chunk to diskf
add_chunk(diskf, cars)
add_chunk(diskf, cars)

nchunks(diskf)  # 2

df2 = disk.frame(file.path(tempdir(), "tmp_add_chunk2"))

# add chunks by specifying the chunk_id number; this is especially useful if
# you wish to add multiple chunk in parallel
add_chunk(df2, data.frame(chunk=1), 1)
add_chunk(df2, data.frame(chunk=2), 3)

nchunks(df2)  # 2

dir(attr(df2, "path", exact=TRUE))
# [1] "1.fst" "3.fst"

# clean up
delete(diskf)
delete(df2)
```

---

anti_join.disk.frame  

Performs join/merge for disk.frames

Description

Performs join/merge for disk.frames

Usage

```r
## S3 method for class 'disk.frame'
anti_join(
  x,
  y,
  by = NULL,
  copy = FALSE,
  .
  outdir = tempfile("tmp_disk_frame_anti_join"),
  merge_by_chunk_id = FALSE,
  overwrite = TRUE,
  .progress = FALSE
)
```
## S3 method for class 'disk.frame'
full_join(
  x,
  y,
  by = NULL,
  copy = FALSE,
  ...
)

full_join = tempfile("tmp_disk_frame_full_join"),
overwrite = TRUE,
merge_by_chunk_id,
.progress = FALSE
)

## S3 method for class 'disk.frame'
inner_join(
  x,
  y,
  by = NULL,
  copy = FALSE,
  suffix = c(".x", ".y"),
  ...
)

keep = FALSE,
outdir = tempfile("tmp_disk_frame_inner_join"),
merge_by_chunk_id = NULL,
overwrite = TRUE,
.progress = FALSE
)

## S3 method for class 'disk.frame'
left_join(
  x,
  y,
  by = NULL,
  copy = FALSE,
  suffix = c(".x", ".y"),
  ...
)

keep = FALSE,
outdir = tempfile("tmp_disk_frame_left_join"),
merge_by_chunk_id = FALSE,
overwrite = TRUE,
.progress = FALSE
)

## S3 method for class 'disk.frame'
semi_join(
  x,
  y,
by = NULL,
copy = FALSE,
..., 
outdir = tempfile("tmp_disk_frame_semi_join"), 
merge_by_chunk_id = FALSE,
overwrite = TRUE,
.progress = FALSE
)

Arguments

x a disk.frame
y a data.frame or disk.frame. If data.frame then returns lazily; if disk.frame it performs the join eagerly and return a disk.frame
by join by
copy same as dplyr::anti_join
... same as dplyr's joins
outdir output directory for disk.frame
merge_by_chunk_id the merge is performed by chunk id
overwrite overwrite output directory
.progress Show progress or not. Defaults to FALSE
suffix see dplyr::XXX_join
keep see dplyr::XXX_join

Value
disk.frame or data.frame/data.table

Examples

df.df = as.disk.frame(data.frame(x = 1:3, y = 4:6), overwrite = TRUE)
df2.df = as.disk.frame(data.frame(x = 1:2, z = 10:11), overwrite = TRUE)

anti_joined.df = anti_join(df.df, df2.df)

anti_joined.df %>% collect

anti_joined.data.frame = anti_join(df.df, data.frame(x = 1:2, z = 10:11))

# clean up
delete(df.df)
delete(df2.df)
delete(anti_joined.df)
cars.df = as.disk.frame(cars)

join.df = full_join(cars.df, cars.df, merge_by_chunk_id = TRUE)
as.data.frame.disk.frame

Convert disk.frame to data.frame by collecting all chunks

Description

Convert disk.frame to data.frame by collecting all chunks

Usage

```r
## S3 method for class 'disk.frame'
as.data.frame(x, row.names = NULL, optional = FALSE, ...)
```

Arguments

- `x` a disk.frame
- `row.names` NULL or a character vector giving the row names for the data frame. Missing values are not allowed.
- `optional` logical. If TRUE, setting row names and converting column names (to syntactic names: see make.names) is optional. Note that all of R’s base package as.data.frame() methods use optional only for column names treatment, basically with the meaning of data.frame(*, check.names = !optional). See also the make.names argument of the matrix method.
- `...` additional arguments to be passed to or from methods.
as.disk.frame

Examples

cars.df = as.disk.frame(cars)
as.data.frame(cars.df)

# clean up
delete(cars.df)

as.data.table.disk.frame

Convert disk.frame to data.table by collecting all chunks

Description

Convert disk.frame to data.table by collecting all chunks

Usage

## S3 method for class 'disk.frame'
as.data.table(x, keep.rownames = FALSE, ...)

Arguments

x a disk.frame
keep.rownames passed to as.data.table
... passed to as.data.table

Examples

library(data.table)
cars.df = as.disk.frame(cars)
as.data.table(cars.df)

# clean up
delete(cars.df)

as.disk.frame

Make a data.frame into a disk.frame

Description

Make a data.frame into a disk.frame
bind_rows.disk.frame

Usage

as.disk.frame(
  df,
  outdir = tempfile(fileext = ".df"),
  nchunks = recommend_nchunks(df),
  overwrite = FALSE,
  shardby = NULL,
  compress = 50,
  ...
)

Arguments

  df          a disk.frame
  outdir      the output directory
  nchunks     number of chunks
  overwrite   if TRUE the outdir will be overwritten, if FALSE it will throw an error if the
directory is not empty
  shardby     The shardkey
  compress    the compression level 0-100; 100 is highest
  ...         passed to output_disk.frame

Examples

  # write to temporary location
cars.df = as.disk.frame(cars)
  
  # specify a different path in the temporary folder, you are free to choose a different folder
cars_new_location.df = as.disk.frame(cars, outdir = file.path(tempdir(), "some_path.df"))
  
  # specify a different number of chunks
  # this writes to tempdir() by default
cars_chunks.df = as.disk.frame(cars, nchunks = 4, overwrite = TRUE)
  
  # clean up
delete(cars.df)
delete(cars_new_location.df)
delete(cars_chunks.df)

bind_rows.disk.frame  Bind rows

Description

  Bind rows
chunk_summarize

Usage

bind_rows.disk.frame(...)  

Arguments

... disk.frame to be row bound

Description

The disk.frame group by operation perform group WITHIN each chunk. This is often used for performance reasons. If the user wishes to perform group-by, they may choose to use the ‘hard_group_by’ function which is expensive as it reorganizes the chunks by the shard key.

Usage

chunk_summarize(.data, ...)  
chunk_summarise(.data, ...)  
chunk_group_by(.data, ...)  
chunk_ungroup(.data, ...)

Arguments

.data a disk.frame

... passed to dplyr::group_by

See Also

hard_group_by group_by
Apply the same function to all chunks

Description

Apply the same function to all chunks

`cimap.disk.frame` accepts a two argument function where the first argument is a data.frame and the second is the chunk ID

`lazy` is convenience function to apply `.f` to every chunk

`delayed` is an alias for lazy and is consistent with the naming in Dask and Dagger.jl

Usage

cmap(.x, .f, ...)

## S3 method for class 'disk.frame'
cmap(.x, .f, ...)

cmap_dfr(.x, .f, ..., .id = NULL)

## S3 method for class 'disk.frame'
cmap_dfr(.x, .f, ..., .id = NULL, use.names = fill, fill = FALSE, idcol = NULL)

cimap(.x, .f, ...)

## S3 method for class 'disk.frame'
cimap(
  .x,
  .f,
  outdir = NULL,
  keep = NULL,
  lazy = TRUE,
  overwrite = FALSE,
  compress = 50,
  ...
)

cimap_dfr(.x, .f, ..., .id = NULL)

## S3 method for class 'disk.frame'
cimap_dfr(
  .x,
  .f,
  ...
  .id = NULL,
  use.names = fill,
fill = FALSE,
idcol = NULL
)
lazy(.x, .f, ...)

## S3 method for class 'disk.frame'
lazy(.x, .f, ...)
delayed(.x, .f, ...)
clapply(...)

Arguments

.x a disk.frame
.f a function to apply to each of the chunks
... Passed to 'collect' and 'write_disk.frame'
.id ignored
use.names for cmap_dfr's call to data.table::rbindlist. See data.table::rbindlist
fill for cmap_dfr's call to data.table::rbindlist. See data.table::rbindlist
idcol for cmap_dfr's call to data.table::rbindlist. See data.table::rbindlist
outdir the output directory
keep The columns to keep at source
lazy if TRUE then do this lazily
overwrite Whether to overwrite any files in the output directory
compress The compression setting. 0-100

Examples

cars.df = as.disk.frame(cars)

# return the first row of each chunk lazily
#
cars2 = cmap(cars.df, function(chunk) {
  chunk[,1]
})

collect(cars2)

# same as above but using purrr
cars2 = cmap(cars.df, ~.x[1,])

collect(cars2)

# return the first row of each chunk eagerly as list
cmap(cars.df, ~.x[1,], lazy = FALSE)
# return the first row of each chunk eagerly as data.table/data.frame by row-binding
cmap_dfr(cars.df, ~.x[1,])

# lazy and delayed are just an aliases for cmap(..., lazy = TRUE)
collect(lazy(cars.df, ~.x[1,]))
collect(delayed(cars.df, ~.x[1,]))

# clean up cars.df
delete(cars.df)

cmap2

'cmap2' a function to two disk.frames

Description
Perform a function on both disk.frames .x and .y, each chunk of .x and .y gets run by .f(x.chunk, y.chunk)

Usage

cmap2(.x, .y, .f, ...)

map_by_chunk_id(.x, .y, .f, ..., outdir)

Arguments

.x a disk.frame
.y a disk.frame
.f a function to be called on each chunk of x and y matched by chunk_id
... not used
outdir output directory

Examples

cars.df = as.disk.frame(cars)
cars2.df = cmap2(cars.df, cars.df, ~data.table::rbindlist(list(.x, .y)))
collect(cars2.df)

# clean up cars.df
delete(cars.df)
delete(cars2.df)
**collect.disk.frame**   *Bring the disk.frame into R*

**Description**

Bring the disk.frame into RAM by loading the data and running all lazy operations as data.table/data.frame or as a list

Bring the disk.frame into RAM by loading the data and running all lazy operations as data.table/data.frame or as a list

**Usage**

```r
## S3 method for class 'disk.frame'
collect(x, ..., parallel = !is.null(attr(x, "recordings")))

collect_list(
  x,
  simplify = FALSE,
  parallel = !is.null(attr(x, "recordings")),
  ...)

## S3 method for class 'summarized_disk.frame'
collect(x, ..., parallel = !is.null(attr(x, "recordings")))
```

**Arguments**

- `x`  
  a disk.frame

- `...`  
  not used

- `parallel`  
  if TRUE the collection is performed in parallel. By default if there are delayed/lazy steps then it will be parallel, otherwise it will not be in parallel. This is because parallel requires transferring data from background R session to the current R session and if there is no computation then it’s better to avoid transferring data between session, hence parallel = FALSE is a better choice

- `simplify`  
  Should the result be simplified to array

**Value**

- collect return a data.frame/data.table
- collect_list returns a list
- collect return a data.frame/data.table
Examples

cars.df = as.disk.frame(cars)
# use collect to bring the data into RAM as a data.table/data.frame
collect(cars.df)

# clean up
delete(cars.df)
cars.df = as.disk.frame(cars)

# returns the result as a list
collect_list(cmap(cars.df, ~1))

# clean up
delete(cars.df)
cars.df = as.disk.frame(cars)
# use collect to bring the data into RAM as a data.table/data.frame
collect(cars.df)

# clean up
delete(cars.df)

colnames

Return the column names of the disk.frame

description

The returned column names are from the source. So if you have lazy operations then the colnames
here does not reflects the results of those operations. Note: if you have expensive lazy function then
this operation might take some time.

Usage

colnames(x, ...)

## S3 method for class 'disk.frame'
names(x, ...)

## S3 method for class 'disk.frame'
colnames(x, ...)

## Default S3 method:
colnames(x, ...)

Arguments

x a disk.frame
...
not used
**compute.disk.frame**

Force computations. The results are stored in a folder.

**Description**

Perform the computation; same as calling cmap without .f and lazy = FALSE

**Usage**

```r
## S3 method for class 'disk.frame'
compute(x, name = NULL, outdir = tempfile("tmp_df_", fileext = ".df"), ...)
```

**Arguments**

- `x` a disk.frame
- `name` If not NULL then used as outdir prefix.
- `outdir` the output directory
- `...` Passed to `write_disk.frame`

**Examples**

```r
cars.df = as.disk.frame(cars)
cars.df2 = cars.df %>% cmap(~.x)
# the computation is performed and the data is now stored elsewhere
cars.df3 = compute(cars.df2)

# clean up
delete(cars.df)
delete(cars.df3)
```

**create_chunk_mapper**

Create function that applies to each chunk if disk.frame

**Description**

A function to make it easier to create functions like filter

**Usage**

```r
create_chunk_mapper(chunk_fn, warning_msg = NULL, as.data.frame = FALSE)
```

**Arguments**

- `chunk_fn` The dplyr function to create a mapper for
- `warning_msg` The warning message to display when invoking the mapper
- `as.data.frame` force the input chunk of a data.frame; needed for dplyr
Examples

```r
filter = create_chunk_mapper(dplyr::filter)

# example: creating a function that keeps only the first and last n row
first_and_last <- function(chunk, n, ...) {
  nr = nrow(chunk)
  print(nr-n+1:nr)
  chunk[c(1:n, (nr-n+1):nr), ]
}

# create the function for use with disk.frame
first_and_last_df = create_chunk_mapper(first_and_last)

mtcars.df = as.disk.frame(mtcars)

# the operation is lazy
lazy_mtcars.df = mtcars.df %>%
  first_and_last_df(2)

# bring into R
collect(lazy_mtcars.df)

# clean up
delete(mtcars.df)
```

csv_to_disk.frame

Convert CSV file(s) to disk.frame format

Description

Convert CSV file(s) to disk.frame format

Usage

```r
csv_to_disk.frame(
  infile,
  outdir = tempfile(fileext = ".df"),
  inmapfn = base::I,
  nchunks = recommend_nchunks(sum(file.size(infile))),
  in_chunk_size = NULL,
  shardby = NULL,
  compress = 50,
  overwrite = TRUE,
  header = TRUE,
  .progress = TRUE,
  backend = c("data.table", "readr", "LaF"),
)```
chunk_reader = c("bigreadr", "data.table", "readr", "readLines"),
...
)

Arguments

infile | The input CSV file or files
outdir | The directory to output the disk.frame to
inmapfn | A function to be applied to the chunk read in from CSV before the chunk is being written out. Commonly used to perform simple transformations. Defaults to the identity function (ie. no transformation)
nchunks | Number of chunks to output
in_chunk_size | When reading in the file, how many lines to read in at once. This is different to nchunks which controls how many chunks are output
shardby | The column(s) to shard the data by. For example suppose `shardby = c("col1","col2")` then every row where the values `col1` and `col2` are the same will end up in the same chunk; this will allow merging by `col1` and `col2` to be more efficient
compress | For fst backends it's a number between 0 and 100 where 100 is the highest compression ratio.
overwrite | Whether to overwrite the existing directory
header | Whether the files have header. Defaults to TRUE
.progress | A logical, for whether or not to show progress
backend | The CSV reader backend to choose: "data.table" or "readr". disk.frame does not have its own CSV reader. It uses either data.table::fread or readr::read_delimited. It is worth noting that data.table::fread does not detect dates and all dates are imported as strings, and you are encouraged to use fasttime to convert the strings to date. You can use the 'inmapfn' to do that. However, if you want automatic date detection, then backend="readr" may suit your needs. However, readr is often slower than data.table, hence data.table is chosen as the default.
chunk_reader | Even if you choose a backend there can still be multiple strategies on how to approach the CSV reads. For example, data.table::fread tries to mmap the whole file which can cause the whole read process to fail. In that case we can change the chunk_reader to "readLines" which uses the readLines function to read chunk by chunk and still use data.table::fread to process the chunks. There are currently no strategies for readr backend, except the default one.
...

See Also

Other ingesting data: zip_to_disk.frame()

Examples

tmpfile = tempfile()
write.csv(cars, tmpfile)
tmpdf = tempfile(fileext = ".df")
df = csv_to_disk.frame(tmpfile, outdir = tmpdf, overwrite = TRUE)

# clean up
fs::file_delete(tmpfile)
delete(df)

delete  
Delete a disk.frame

Description
Delete a disk.frame

Usage
delete(df)

Arguments
df  
a disk.frame

Examples
cars.df = as.disk.frame(cars)
delete(cars.df)

df_ram_size  
Get the size of RAM in gigabytes

Description
Get the size of RAM in gigabytes

Usage
df_ram_size()

Value
integer of RAM in gigabyte (GB)

Examples
# returns the RAM size in gigabyte (GB)
df_ram_size()
disk.frame

Create a disk.frame from a folder

Description

Create a disk.frame from a folder

Usage

disk.frame(path, backend = "fst")

Arguments

- path: The path to store the output file or to a directory
- backend: The only available backend is fst at the moment

Examples

path = file.path(tempdir(), "cars")
as.disk.frame(cars, outdir = path, overwrite = TRUE, nchunks = 2)
df = disk.frame(path)
head(df)
nchunks(df)
# clean up
delete(df)

disk.frame_to_parquet

A function to convert a disk.frame to parquet format

Description

A function to convert a disk.frame to parquet format

Usage

disk.frame_to_parquet(df, outdir)

Arguments

- df: a disk.frame or a path to a disk.frame
- outdir: the path to save the parquet files
evalparseglue  

Helper function to evalparse some `glue::glue` string

Description

Helper function to evalparse some `glue::glue` string

Usage

```
evalparseglue(code, env = parent.frame())
```

Arguments

code  
the code in character(string) format to evaluate

env  
the environment in which to evaluate the code

find_globals_recursively

Find globals in an expression by searching through the chain

Description

Find globals in an expression by searching through the chain

Usage

```
find_globals_recursively(code, envir)
```

Arguments

code  
an expression to search for globals

envir  
The environment from which to begin the search
foverlaps.disk.frame  Apply data.table's foverlaps to the disk.frame

Description

EXPERIMENTAL

Usage

foverlaps.disk.frame(
  df1,
  df2,
  by.x = if (identical(shardkey(df1)$shardkey, "")) shardkey(df1)$shardkey else
         shardkey(df2)$shardkey,
  by.y = shardkey(df2)$shardkey,
  ...,
  outdir = tempfile("df_foverlaps_tmp", fileext = ".df"),
  merge_by_chunk_id = FALSE,
  compress = 50,
  overwrite = TRUE
)

Arguments

df1  A disk.frame
df2  A disk.frame or a data.frame
by.x character/string vector. by.x used in foverlaps
by.y character/string vector. by.x used in foverlaps
... passed to data.table::foverlaps and disk.frame::cmap.disk.frame
outdir The output directory of the disk.frame
merge_by_chunk_id  If TRUE then the merges will happen for chunks in df1 and df2 with the same chunk id which speed up processing. Otherwise every chunk of df1 is merged with every chunk of df2. Ignored with df2 is not a disk.frame
compress  The compression ratio for fst
overwrite  overwrite existing directory

Examples

library(data.table)

## simple example:
x = as.disk.frame(data.table(start=c(5,31,22,16), end=c(8,50,25,18), val2 = 7:10))
y = as.disk.frame(data.table(start=c(10, 20, 30), end=c(15, 35, 45), val1 = 1:3))
byxy = c("start", "end")
xy.df = foverlaps.disk.frame(  
  x, y, by.x = byxy, by.y = byxy,  
  merge_by_chunk_id = TRUE, overwrite = TRUE)
# clean up
delete(x)
delete(y)
delete(xy.df)

---

gen_datatable_synthetic

*Generate synthetic dataset for testing*

**Description**

Generate synthetic dataset for testing

**Usage**

gen_datatable_synthetic(N = 2e+08, K = 100)

**Arguments**

- **N**
  
  number of rows. Defaults to 200 million

- **K**
  
  controls the number of unique values for id. Some ids will have K distinct values while others have N/K distinct values

---

get_chunk

*Obtain one chunk by chunk id*

**Description**

Obtain one chunk by chunk id

**Usage**

get_chunk(...)

## S3 method for class 'disk.frame'

get_chunk(df, n, keep = NULL, full.names = FALSE, ..., partitioned_info = NULL)
get_chunk_ids

Arguments

... passed to fst::read_fst or whichever read function is used in the backend

df a disk.frame

n the chunk id. If numeric then matches by number, if character then returns the chunk with the same name as n

keep the columns to keep

full.names whether n is the full path to the chunks or just a relative path file name. Ignored if n is numeric

partitioned_info for internal use only. It’s a data.frame used to help with filtering by partitions

Examples

cars.df = as.disk.frame(cars, nchunks = 2)
get_chunk(cars.df, 1)
get_chunk(cars.df, 2)
get_chunk(cars.df, 1, keep = "speed")

# if full.names = TRUE then the full path to the chunk need to be provided
get_chunk(cars.df, file.path(attr(cars.df, "path"), "1.fst"), full.names = TRUE)

# clean up cars.df
delete(cars.df)

get_chunk_ids

Get the chunk IDs and files names

Description

Get the chunk IDs and files names

Usage

get_chunk_ids(df, ..., full.names = FALSE, strip_extension = TRUE)

Arguments

df a disk.frame

... passed to list.files

full.names If TRUE returns the full path to the file, Defaults to FALSE

strip_extension If TRUE then the file extension in the chunk_id is removed. Defaults to TRUE
get_partition_paths

Examples

cars.df = as.disk.frame(cars)

# return the integer-string chunk IDs
get_chunk_ids(cars.df)

# return the file name chunk IDs
get_chunk_ids(cars.df, full.names = TRUE)

# return the file name chunk IDs with file extension
get_chunk_ids(cars.df, strip_extension = FALSE)

# clean up cars.df
delete(cars.df)

groups.disk.frame

Description
The shard keys of the disk.frame

Usage

## S3 method for class 'disk.frame'
groups(x)

Arguments

x a disk.frame
Value

character

head.disk.frame  
Head and tail of the disk.frame

Description

Head and tail of the disk.frame

Usage

```r
## S3 method for class 'disk.frame'
head(x, n = 6L, ...)
```

```r
## S3 method for class 'disk.frame'
tail(x, n = 6L, ...)
```

Arguments

- `x` a disk.frame
- `n` number of rows to include
- `...` passed to base::head or base::tail

Examples

```r
cars.df = as.disk.frame(cars)
head(cars.df)
tail(cars.df)

# clean up
delete(cars.df)
```

is_disk.frame  
Checks if a folder is a disk.frame

Description

Checks if a folder is a disk.frame

Usage

```r
is_disk.frame(df)
```
merge.disk.frame

Arguments

df a disk.frame or directory to check

Examples

cars.df = as.disk.frame(cars)

is_disk.frame(cars) # FALSE
is_disk.frame(cars.df) # TRUE

# clean up cars.df
delete(cars.df)

merge.disk.frame Merge function for disk.frames

Description

Merge function for disk.frames

Usage

## S3 method for class 'disk.frame'
merge(
  x,
  y,
  by,
  outdir = tempfile(fileext = ".df"),
  ...,
  merge_by_chunk_id = FALSE,
  overwrite = FALSE
)

Arguments

x a disk.frame
y a disk.frame or data.frame
by the merge by keys
outdir The output directory for the disk.frame
... passed to merge and cmap.disk.frame
merge_by_chunk_id if TRUE then only chunks in df1 and df2 with the same chunk id will get merged
overwrite overwrite the outdir or not
move_to

Examples

b = as.disk.frame(data.frame(a = 51:150, b = 1:100))
d = as.disk.frame(data.frame(a = 151:250, b = 1:100))
bd.df = merge(b, d, by = "b", merge_by_chunk_id = TRUE)

# clean up cars.df
delete(b)
delete(d)
delete(bd.df)

move_to

Move or copy a disk.frame to another location

Usage

move_to(df, outdir, ..., copy = FALSE)
copy_df_to(df, outdir, ...)

Arguments

df The disk.frame
outdir The new location
... NOT USED
copy Merely copy and not move

Value

a disk.frame

Examples

cars.df = as.disk.frame(cars)
cars_copy.df = copy_df_to(cars.df, outdir = tempfile(fileext=".df"))
cars2.df = move_to(cars.df, outdir = tempfile(fileext=".df"))

# clean up
delete(cars_copy.df)
delete(cars2.df)
nchunks

Returns the number of chunks in a disk.frame

Description

Returns the number of chunks in a disk.frame

Usage

nchunks(df, ...)
nchunk(df, ...)

## S3 method for class 'disk.frame'
nchunk(df, ...)

## S3 method for class 'disk.frame'
nchunks(df, skip.ready.check = FALSE, ...)

Arguments

df a disk.frame
...
not used
skip.ready.check
  NOT implemented

Examples

cars.df = as.disk.frame(cars)

# return the number of chunks
nchunks(cars.df)
nchunk(cars.df)

# clean up cars.df
delete(cars.df)

nrow

Number of rows or columns

Description

Number of rows or columns
Usage

```
nrow(df, ...)
```

```r
## S3 method for class 'disk.frame'
nrow(df, ...)
```

```
ncol(df)
```

```r
## S3 method for class 'disk.frame'
ncol(df)
```

Arguments

- `df` a disk.frame
- `...` passed to base::nrow

Examples

```r
cars.df = as.disk.frame(cars)

# return total number of column and rows
ncol(cars.df)
nrow(cars.df)

# clean up cars.df
delete(cars.df)
```

---

overwrite_check

Check if the outdir exists or not

Description

If the overwrite is TRUE then the folder will be deleted, otherwise the folder will be created.

Usage

```
overwrite_check(outdir, overwrite)
```

Arguments

- `outdir` the output directory
- `overwrite` TRUE or FALSE if ‘outdir’ exists and overwrite = FALSE then throw an error
Examples

```r
tf = tempfile()
overwrite_check(tf, overwrite = FALSE)
overwrite_check(tf, overwrite = TRUE)

# clean up
fs::dir_delete(tf)
```

partition_filter

Filter the dataset based on folder partitions

Description

Filter the dataset based on folder partitions

Usage

```r
partition_filter(x, ...)
```

Arguments

- `x`: a disk.frame
- `...`: filtering conditions for filtering the disk.frame at (folder) partition level

play

Play the recorded lazy operations

Description

Play the recorded lazy operations

Usage

```r
play(dataframe, recordings)
```

Arguments

- `dataframe`: A data.frame
- `recordings`: A recording the expression, globals and packages using create_chunk_mapper
### print.disk.frame

**Description**

A new print method for disk.frame

**Usage**

```r
## S3 method for class 'disk.frame'
print(x, ...)
```

**Arguments**

- `x`: disk.frame
- `...`: not used

### pull.disk.frame

**Description**

Pull a column from table similar to `dplyr::pull`.

**Usage**

```r
## S3 method for class 'disk.frame'
pull(.data, var = -1, name = NULL, ...)
```

**Arguments**

- `.data`: The disk.frame
- `var`: can be a positive or negative integer or a character/string. See `dplyr::pull` documentation
- `name`: See `dplyr::pull` documentation
- `...`: Not used, kept for compatibility with `dplyr::pull`
purrr_as_mapper  

*Used to convert a function to purrr syntax if needed*

**Description**

Used to convert a function to purrr syntax if needed

**Usage**

```r
purrr_as_mapper(.f)
```

**Arguments**

- `.f` a normal function or purrr syntax function i.e. `~ ...code...`

**rbindlist.disk.frame**  

*rbindlist disk.frames together*

**Description**

rbindlist disk.frames together

**Usage**

```r
rbindlist.disk.frame(df_list, 
                      outdir = tempfile(fileext = "df"), 
                      by_chunk_id = TRUE, 
                      parallel = TRUE, 
                      compress = 50, 
                      overwrite = TRUE, 
                      .progress = TRUE)
```

**Arguments**

- `df_list` A list of disk.frames
- `outdir` Output directory of the row-bound disk.frames
- `by_chunk_id` If TRUE then only the chunks with the same chunk IDs will be bound
- `parallel` if TRUE then bind multiple disk.frame simultaneously, Defaults to TRUE
- `compress` 0-100, 100 being the highest compression rate.
- `overwrite` overwrite the output directory
- `.progress` A logical, for whether or not to show progress.
Examples

cars.df = as.disk.frame(cars)

# row-bind two disk.frames
cars2.df = rbindlist.disk.frame(list(cars.df, cars.df))

# clean up cars.df
delete(cars.df)
delete(cars2.df)

---

rechunk

Increase or decrease the number of chunks in the disk.frame

Description

Increase or decrease the number of chunks in the disk.frame

Usage

rechunk(
  df,
  nchunks = disk.frame::nchunks(df),
  outdir = attr(df, "path", exact = TRUE),
  shardby = NULL,
  overwrite = TRUE
)

Arguments

df the disk.frame to rechunk
nchunks number of chunks
outdir the output directory
shardby the shardkeys
overwrite overwrite the output directory

Examples

# create a disk.frame with 2 chunks in tempdir()
cars.df = as.disk.frame(cars, nchunks = 2)

# re-chunking cars.df to 3 chunks, done "in-place" to the same folder as cars.df
rechunk(cars.df, 3)

new_path = tempfile(fileext = ".df")
# re-chunking cars.df to 4 chunks, shard by speed, and done "out-of-place" to a new directory
cars2.df = rechunk(cars.df, 4, outdir=new_path, shardby = "speed")
# clean up cars.df
delete(cars.df)
delete(cars2.df)

---

**recommend_nchunks**  
*Recommend number of chunks based on input size*

**Description**

Computes the recommended number of chunks to break a data.frame into. It can accept file sizes in bytes (as integer) or a data.frame

**Usage**

```r
recommend_nchunks(
  df,
  type = "csv",
  minchunks = data.table::getDTthreads(),
  conservatism = 8,
  ram_size = df_ram_size()
)
```

**Arguments**

- `df`: a data.frame or the file size in bytes of a CSV file holding the data
- `type`: only = "csv" is supported. It indicates the file type corresponding to file size `df`
- `minchunks`: the minimum number of chunks. Defaults to the number of CPU cores (without hyper-threading)
- `conservatism`: a multiplier to the recommended number of chunks. The more chunks the smaller the chunk size and more likely that each chunk can fit into RAM
- `ram_size`: The amount of RAM available which is usually computed. Except on RStudio with R3.6+

**Examples**

```r
# recommend nchunks based on data.frame
recommend_nchunks(cars)

# recommend nchunks based on file size ONLY CSV is implemented at the moment
recommend_nchunks(1024^3)
```
remove_chunk

Removes a chunk from the disk.frame

Description

Removes a chunk from the disk.frame

Usage

remove_chunk(df, chunk_id, full.names = FALSE)

Arguments

df a disk.frame
chunk_id the chunk ID of the chunk to remove. If it's a number then return number.fst
full.names TRUE or FALSE. Defaults to FALSE. If true then chunk_id is the full path to
the chunk otherwise it's the relative path

Examples

# TODO add these to tests
cars.df = as.disk.frame(cars, nchunks = 4)

# removes 3rd chunk
remove_chunk(cars.df, 3)
nchunks(cars.df) # 3

# removes 4th chunk
remove_chunk(cars.df, "4.fst")
nchunks(cars.df) # 3

# removes 2nd chunk
remove_chunk(cars.df, file.path(attr(cars.df, "path", exact=TRUE), "2.fst"), full.names = TRUE)
nchunks(cars.df) # 1

# clean up cars.df
delete(cars.df)

sample_frac.disk.frame

Sample n rows from a disk.frame

Description

Sample n rows from a disk.frame
## S3 method for class `disk.frame`

```r
disk.frame
```

### select

```r
## S3 method for class 'disk.frame'
select(.data, ...)  
```

### rename

```r
## S3 method for class 'disk.frame'
rename(.data, ...)  
```

### filter

```r
## S3 method for class 'disk.frame'
filter(.data, ...)  
```

### mutate

```r
## S3 method for class 'disk.frame'
mutate(.data, ...)  
```

---

**select.disk.frame**

*The dplyr verbs implemented for disk.frame*

### Usage

```
Usage
```  
```
## S3 method for class 'disk.frame'
sample_frac(tbl, size = 1, replace = FALSE, weight = NULL, .env = NULL, ...)
```

### Arguments

- **tbl**
  - A data.frame.

- **size**
  - `<tidy-select>` For `sample_n()`, the number of rows to select. For `sample_frac()`, the fraction of rows to select. If `tbl` is grouped, size applies to each group.

- **replace**
  - Sample with or without replacement?

- **weight**
  - `<tidy-select>` Sampling weights. This must evaluate to a vector of non-negative numbers the same length as the input. Weights are automatically standardised to sum to 1.

- **.env**
  - DEPRECATED.

- **...**
  - ignored

### Examples

```
cars.df = as.disk.frame(cars)

collect(sample_frac(cars.df, 0.5))
```

```
# clean up cars.df
delete(cars.df)
```
## S3 method for class 'disk.frame'
transmute(.data, ...)

## S3 method for class 'disk.frame'
arrange(.data, ...)

chunk_arrange(.data, ...)

## S3 method for class 'disk.frame'
distinct(...)

chunk_distinct(.data, ...)

## S3 method for class 'disk.frame'
glimpse(x, width = NULL, ...)

**Arguments**

- `.data` a disk.frame
- `...` Same as the dplyr functions
- `x` 'dplyr::glimpse' parameter
- `width` 'dplyr::glimpse' parameter

**Examples**

```r
library(dplyr)
cars.df = as.disk.frame(cars)
mult = 2

# use all any of the supported dplyr
cars2 = cars.df %>%
  select(speed) %>%
  mutate(speed2 = speed * mult) %>%
  filter(speed < 50) %>%
  rename(speed1 = speed) %>%
  collect

# clean up cars.df
delete(cars.df)
```

---

**setup_disk.frame**  
Set up disk.frame environment

**Description**

Set up disk.frame environment
Usage

setup_disk.frame(
  workers = data.table::getDTthreads(),
  future_backend = future::multisession,
  ..., 
  gui = FALSE
)

Arguments

workers  the number of workers (background R processes in the
future_backend which future backend to use for parallelization
...  passed to ‘future::plan’
gui  Whether to use a Graphical User Interface (GUI) for selecting the options. De-
defaults to FALSE

Examples

if (interactive()) {
  # setup disk.frame to use multiple workers these may use more than two
  # cores, and is therefore not allowed on CRAN. Hence it's set to run only in
  # interactive session
  setup_disk.frame()

  # use a Shiny GUI to adjust settings
  # only run in interactive()
  setup_disk.frame(gui = TRUE)
}

# set the number workers to 2
setup_disk.frame(2)

# if you do not wish to use multiple workers you can set it to sequential
setup_disk.frame(future_backend=future::sequential)

shard  Shard a data.frame/data.table or disk.frame into chunk and saves it
        into a disk.frame

Description

Shard a data.frame/data.table or disk.frame into chunk and saves it into a disk.frame
‘distribute‘ is an alias for ‘shard‘
Usage

shard(
  df,
  shardby,
 outdir = tempfile(fileext = ".df"),
  ...,  
  nchunks = recommend_nchunks(df),
  overwrite = FALSE
)

distribute(...)

Arguments

df 
A data.frame/data.table or disk.frame. If disk.frame, then rechunk(df, ...) is run

shardby 
The column(s) to shard the data by.

outdir 
The output directory of the disk.frame

... not used

nchunks 
The number of chunks

overwrite 
If TRUE then the chunks are overwritten

Examples

# shard the cars data.frame by speed so that rows with the same speed are in the same chunk
iris.df = shard(iris, "Species")

# clean up cars.df
delete(iris.df)

---

shardkey 
Returns the shardkey (not implemented yet)

Description

Returns the shardkey (not implemented yet)

Usage

shardkey(df)

Arguments

df 
a disk.frame
shardkey_equal

**Description**

Compare two disk.frame shardkeys

**Usage**

```r
shardkey_equal(sk1, sk2)
```

**Arguments**

- `sk1`: shardkey1
- `sk2`: shardkey2

---

**show_ceremony**

*Show the code to setup disk.frame*

**Description**

Show the code to setup disk.frame

**Usage**

```r
show_ceremony()
```

- `ceremony_text()`
- `show_boilerplate()`
- `insert_ceremony()`

---

**split_string_into_df**

*Turn a string of the form /partition1=val/partition2=val2 into data.frame*

**Description**

Turn a string of the form /partition1=val/partition2=val2 into data.frame

**Usage**

```r
split_string_into_df(path_strs)
```

**Arguments**

- `path_strs`: The paths in string form to break into partition format
srckeep  
*Keep only the variables from the input listed in selections*

**Description**

Keep only the variables from the input listed in selections

**Usage**

```
srckeep(diskf, selections, ...)
```

**Arguments**

- **diskf**: a disk.frame
- **selections**: The list of variables to keep from the input source
- **...**: not yet used

**Examples**

```
cars.df = as.disk.frame(cars)

# when loading cars's chunks into RAM, load only the column speed
collect(srckeep(cars.df, "speed"))

# clean up cars.df
delete(cars.df)
```

---

**summarise.grouped_disk.frame**

*A function to parse the summarize function*

**Description**

The disk.frame group by operation perform group WITHIN each chunk. This is often used for performance reasons. If the user wishes to perform group-by, they may choose to use the 'hard_group_by' function which is expensive as it reorganizes the chunks by the shard key.

**Usage**

```
## S3 method for class 'grouped_disk.frame'
summarise(.data, ...)

## S3 method for class 'grouped_disk.frame'
summarize(.data, ...)
```
## S3 method for class 'disk.frame'
group_by(
  .data,
  ..., 
  .add = FALSE,
  .drop = stop("disk.frame does not support `.drop` in `group_by` at this stage")
)

## S3 method for class 'disk.frame'
summarize(.data, ...)

## S3 method for class 'disk.frame'
summarise(.data, ...)

**Arguments**

- `.data` a `disk.frame`
- `...` same as the `dplyr::group_by`
- `.add` from `dplyr`
- `.drop` from `dplyr`

**See Also**

- `hard_group_by`

---

**Description**

Returns the names of the columns. Needed for RStudio to complete variable names

**Usage**

```r
## S3 method for class 'disk.frame'
tbl_vars(x)

## S3 method for class 'disk.frame'
group_vars(x)
```

**Arguments**

- `x` a `disk.frame`
var_df.chunk_agg.disk.frame

One Stage function

Description
One Stage function
mean chunk_agg
mean collected_agg

Usage
var_df.chunk_agg.disk.frame(x, na.rm = FALSE)
var_df.collected_agg.disk.frame(listx)
sd_df.chunk_agg.disk.frame(x, na.rm = FALSE)
sd_df.collected_agg.disk.frame(listx)
mean_df.chunk_agg.disk.frame(x, na.rm = FALSE, ...)
mean_df.collected_agg.disk.frame(listx)
sum_df.chunk_agg.disk.frame(x, ...)
sum_df.collected_agg.disk.frame(listx, ...)
min_df.chunk_agg.disk.frame(x, ...)
min_df.collected_agg.disk.frame(listx, ...)
max_df.chunk_agg.disk.frame(x, ...)
max_df.collected_agg.disk.frame(listx, ...)
median_df.chunk_agg.disk.frame(x, ...)
median_df.collected_agg.disk.frame(listx, ...)
n_df.chunk_agg.disk.frame(...)
n_df.collected_agg.disk.frame(listx, ...)
length_df.chunk_agg.disk.frame(x, ...)
length_df.collected_agg.disk.frame(listx, ...)

any_df.chunk_agg.disk.frame(x, ...)

any_df.collected_agg.disk.frame(listx, ...)

all_df.chunk_agg.disk.frame(x, ...)

all_df.collected_agg.disk.frame(listx, ...)

n_distinct_df.chunk_agg.disk.frame(x, na.rm = FALSE, ...)

n_distinct_df.collected_agg.disk.frame(listx, ...)

quantile_df.chunk_agg.disk.frame(x, ...)

quantile_df.collected_agg.disk.frame(listx, ...)

IQR_df.chunk_agg.disk.frame(x, na.rm = FALSE, ...)

IQR_df.collected_agg.disk.frame(listx, ...)

Arguments

x
    the input
na.rm
    Remove NAs. TRUE of FALSE
listx
    a list
...
    additional options

Description

Write a data.frame/disk.frame to a disk.frame location. If df is a data.frame then using the as.disk.frame function is recommended for most cases

Usage

write_disk.frame(
    diskf,
    outdir = tempfile(fileext = ".df"),
    nchunks = ifelse("disk.frame" %in% class(diskf), nchunks.disk.frame(diskf),
                    recommend_nchunks(diskf)),
    overwrite = FALSE,
    shardby = NULL,
partitionby = NULL,
compress = 50,
...
)

disk.frame

output_disk.frame(...)

Arguments

diskf         a disk.frame
outdir       output directory for the disk.frame
nchunks      number of chunks
overwrite    overwrite output directory
shardby      the columns to shard by
partitionby  the columns to (folder) partition by
compress     compression ratio for fst files
...          passed to cmap.disk.frame

Examples

cars.df = as.disk.frame(cars)

# write out a lazy disk.frame to disk
cars2.df = write_disk.frame(cmap(cars.df, ~.x[1,]), overwrite = TRUE)
collect(cars2.df)

# clean up cars.df
delete(cars.df)
delete(cars2.df)

zip_to_disk.frame

zip_to_disk.frame is used to read and convert every CSV file within the zip file to disk.frame format

Description

'zip_to_disk.frame' is used to read and convert every CSV file within the zip file to disk.frame format

Usage

zip_to_disk.frame(
    zipfile,
    outdir,
    ..., validation.check = FALSE,
    overwrite = TRUE
)
Arguments

zipfile  The zipfile
outdir  The output directory for disk.frame
...  passed to fread
validation.check  should the function perform a check at the end to check for validity of output. It can detect issues with conversion
overwrite  overwrite output directory

Value

a list of disk.frame

See Also

Other ingesting data: csv_to_disk.frame()

Examples

# create a zip file containing a csv
csvfile = tempfile(fileext = ".csv")
write.csv(cars, csvfile)
zipfile = tempfile(fileext = ".zip")
zip(zipfile, csvfile)

# read every file and convert it to a disk.frame
zip.df = zip_to_disk.frame(zipfile, tempfile(fileext = ".df"))

# there is only one csv file so it return a list of one disk.frame
zip.df[[1]]

# clean up
unlink(csvfile)
unlink(zipfile)
delete(zip.df[[1]])

[[.disk.frame  [[ interface for disk.frame using fst backend

Description

[[ interface for disk.frame using fst backend
Usage

## S3 method for class 'disk.frame'

df[
  ...,  
  keep = NULL,  
  rbind = TRUE,  
  use.names = TRUE,  
  fill = FALSE,  
  idcol = NULL
]

Arguments

df               a disk.frame
...             same as data.table
keep             the columns to keep
rbind            Whether to rbind the chunks. Defaults to TRUE
use.names        Same as in data.table::rbindlist
fill             Same as in data.table::rbindlist
idcol            Same as in data.table::rbindlist

Examples

cars.df = as.disk.frame(cars)
speed_limit = 50
cars.df[[speed < speed_limit ,.N, cut(dist, pretty(dist))]]

# clean up
delete(cars.df)
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