

Package ‘bigparallelr’

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Title Easy Parallel Tools

Version 0.3.0

Description Utility functions for easy parallelism in R. Include some reexports from other packages, utility functions for splitting and parallelizing over blocks, and choosing and setting the number of cores used.

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Imports bigassertr (>= 0.1.1), doParallel, flock, parallel,
RhpCBLASctl

Depends foreach

Suggests testthat, covr

URL <https://github.com/privefl/bigparallelr>

BugReports <https://github.com/privefl/bigparallelr/issues>

NeedsCompilation no

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assert_cores	<i>Check number of cores</i>
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Description

Check that you are not trying to use too many cores.

Usage

```
assert_cores(ncores)
```

Arguments

ncores	Number of cores to check. Make sure is not larger than <code>getOption("bigstatsr.ncores.max")</code> (number of logical cores by default). We advise you to use <code>nb_cores()</code> . If you really know what you are doing, you can change this default value with <code>options(bigstatsr.ncores.max = Inf)</code> .
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Details

It also checks if two levels of parallelism are used, i.e. having `ncores` larger than 1, and having a parallel BLAS enabled by default. You could remove this check by setting `options(bigstatsr.check.parallel.blas = FALSE)`.

We instead recommend that you disable parallel BLAS by default by adding `try(bigparallelr::set_blas_ncores(1), silent = TRUE)` to your `.Rprofile` (**with an empty line at the end of this file**) so that this is set whenever you start a new R session. You can use `usethis::edit_r_profile()` to open your `.Rprofile`. For this to be effective, you should restart the R session or run `options(default.nproc.blas = NULL)` once in the current session.

Then, in a specific R session, you can set a different number of cores to use for matrix computations using `bigparallelr::set_blas_ncores()`, if you know there is no other level of parallelism involved in your code.

Examples

```
## Not run:

assert_cores(2)

## End(Not run)
```

get_blas_ncores	<i>Number of cores used by BLAS (matrix computations)</i>
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Description

Number of cores used by BLAS (matrix computations)

Usage

```
get_blas_ncores()
```

```
set_blas_ncores(ncores)
```

Arguments

ncores Number of cores to set for BLAS.

Examples

```
get_blas_ncores()
```

nb_cores	<i>Recommended number of cores to use</i>
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Description

This is base on the following rule: use only physical cores and if you have only physical cores, leave one core for the OS/UI.

Usage

```
nb_cores()
```

Value

The recommended number of cores to use.

Examples

```
nb_cores()
```

plus	<i>Add</i>
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Description

Wrapper around Reduce to add multiple arguments. Useful

Usage

```
plus(...)
```

Arguments

... Multiple arguments to be added together.

Value

```
Reduce('+', list(...))
```

Examples

```
plus(1:3, 4:6, 1:3)
```

register_parallel	<i>Register parallel</i>
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Description

Register parallel in functions. Do [makeCluster\(\)](#), [registerDoParallel\(\)](#) and [stopCluster\(\)](#) when the function returns.

Usage

```
register_parallel(ncores, ...)
```

Arguments

ncores Number of cores to use. If using only one, then this function uses [foreach::registerDoSEQ\(\)](#).
 ... Arguments passed on to [makeCluster\(\)](#).

Examples

```
## Not run:

test <- function(ncores) {
  register_parallel(ncores)
  foreach(i = 1:2) %dopar% i
}

test(2) # only inside the function
foreach(i = 1:2) %dopar% i

## End(Not run)
```

`split_costs`*Split costs in blocks*

Description

Split costs in consecutive blocks using a greedy algorithm that tries to find blocks of even total cost.

Usage

```
split_costs(costs, nb_split)
```

Arguments

`costs` Vector of costs (e.g. proportional to computation time).
`nb_split` Number of blocks.

Value

A matrix with 4 columns lower, upper, size and cost.

Examples

```
split_costs(costs = 150:1, nb_split = 3)
split_costs(costs = rep(1, 151), nb_split = 3)
split_costs(costs = 150:1, nb_split = 30)
```

split_len	<i>Split length in blocks</i>
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Description

Split length in blocks

Usage

```
split_len(total_len, block_len, nb_split = ceiling(total_len/block_len))
```

Arguments

total_len	Length to split.
block_len	Maximum length of each block.
nb_split	Number of blocks. Default uses the other 2 parameters.

Value

A matrix with 3 columns lower, upper and size.

Examples

```
split_len(10, block_len = 3)
split_len(10, nb_split = 3)
```

split_parapply	<i>Split-parApply-Combine</i>
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Description

A Split-Apply-Combine strategy to parallelize the evaluation of a function.

Usage

```
split_parapply(
  FUN,
  ind,
  ...,
  .combine = NULL,
  ncores = nb_cores(),
  nb_split = ncores,
  opts_cluster = list(),
  .costs = NULL
)
```

Arguments

<code>FUN</code>	The function to be applied to each subset matrix.
<code>ind</code>	Initial vector of indices that will be splitted in <code>nb_split</code> .
<code>...</code>	Extra arguments to be passed to <code>FUN</code> .
<code>.combine</code>	Function to combine the results with <code>do.call</code> . This function should accept multiple arguments (using <code>...</code>). For example, you can use <code>c</code> , <code>cbind</code> and <code>rbind</code> . This package also provides function <code>plus</code> to add multiple arguments together. The default is <code>NULL</code> , in which case the results are not combined and are returned as a list, each element being the result of a block.
<code>ncores</code>	Number of cores to use. Default uses <code>nb_cores()</code> .
<code>nb_split</code>	Number of blocks. Default uses <code>ncores</code> .
<code>opts_cluster</code>	Optional parameters for clusters passed as a named list. E.g., you can use <code>type = "FORK"</code> to use forks instead of clusters. You can also use <code>outfile = ""</code> to redirect printing to the console.
<code>.costs</code>	Vector of costs (e.g. proportional to computation time) associated with each element of <code>ind</code> . Default is <code>NULL</code> (same cost).

Details

This function splits indices in parts, then apply a given function to each part and finally combine the results.

Value

Return a list of `ncores` elements, each element being the result of one of the cores, computed on a block. The elements of this list are then combined with `do.call(.combine, .)` if `.combine` is not `NULL`.

Examples

```
## Not run:

str(
  split_parapply(function(ind) {
    sqrt(ind)
  }, ind = 1:10000, ncores = 2)
)

## End(Not run)
```

`split_vec`*Split object in blocks*

Description

Split object in blocks

Usage

```
split_vec(x, block_len, nb_split = ceiling(length(x)/block_len))
```

```
split_df(df, block_len, nb_split = ceiling(nrow(df)/block_len))
```

Arguments

<code>x</code>	Vector to be divided into groups.
<code>block_len</code>	Maximum length (or number of rows) of each block.
<code>nb_split</code>	Number of blocks. Default uses the other 2 parameters.
<code>df</code>	Data frame to be divided into groups.

Value

A list with the splitted objects.

Examples

```
split_vec(1:10, block_len = 3)
str(split_df(iris, nb_split = 3))
```


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