Package ‘benchmarkme’

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\textbf{R topics documented:}

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\end{verbatim}
Benchmark your CPU and compare against other CPUs. Also provides functions for obtaining system specifications, such as RAM, CPU type, and R version.

Author(s)

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See Also

https://github.com/csgillespie/benchmarkme

Examples

```r
## Benchmark your system and compare
## Not run:
res = benchmark_std()
upload_results(res)
plot(res)

## End(Not run)
```
benchmark_io

IO benchmarks

Description

Benchmarking reading and writing a csv file (containing random numbers). The tests are essentially write.csv(x) and read.csv(...) where x is a data frame. Of size MB.

Usage

benchmark_io(
  runs = 3,
  size = c(5, 50),
  tmpdir = tempdir(),
  verbose = TRUE,
  cores = 0L
)

bm_read(runs = 3, size = c(5, 50), tmpdir = tempdir(), verbose = TRUE)

bm_write(runs = 3, size = c(5, 50), tmpdir = tempdir(), verbose = TRUE)

Arguments

- runs: Number of times to run the test. Default 3.
- size: a number specifying the approximate size of the generated csv. Must be one of 5 or 50
- tmpdir: a non-empty character vector giving the directory name. Default tempdir()
- verbose: Default TRUE.
- cores: Default 0 (serial). When cores > 0, the benchmark is run in parallel.

benchmark_std

Run standard benchmarks

Description

This function runs a set of standard benchmarks, which should be suitable for most machines. It runs a collection of matrix benchmark functions

- benchmark_prog
- benchmark_matrix_cal
- benchmark_matrix_fun

To view the list of benchmarks, see get_available_benchmarks.
bm_matrix_cal_manip

Usage

benchmark_std(runs = 3, verbose = TRUE, cores = 0L)

Arguments

- **runs**: Number of times to run the test. Default 3.
- **verbose**: Default TRUE.
- **cores**: Default 0 (serial). When cores > 0, the benchmark is run in parallel.

Details

Setting cores equal to 1 is useful for assessing the impact of the parallel computing overhead.

Examples

```r
## Benchmark your system
## Not run:
res = benchmark_std(3)

## Plot results
plot(res)

## End(Not run)
```

bm_matrix_cal_manip  Matrix calculation benchmarks

Description

A collection of matrix benchmark functions aimed at assessing the calculation speed.

- Creation, transp., deformation of a 2500x2500 matrix.
- 2500x2500 normal distributed random matrix ^1000.
- Sorting of 7,000,000 random values.
- 2500x2500 cross-product matrix (b = a' * a)
- Linear regr. over a 3000x3000 matrix.

These benchmarks have been developed by many authors. See http://r.research.att.com/benchmarks/R-benchmark-25.R for a complete history. The function benchmark_matrix_cal() runs the five bm functions.
Usage

bm_matrix_cal_manip(runs = 3, verbose = TRUE)

bm_matrix_cal_power(runs = 3, verbose = TRUE)

bm_matrix_cal_sort(runs = 3, verbose = TRUE)

bm_matrix_cal_cross_product(runs = 3, verbose = TRUE)

bm_matrix_cal_lm(runs = 3, verbose = TRUE)

benchmark_matrix_cal(runs = 3, verbose = TRUE, cores = 0L)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>runs</td>
<td>Number of times to run the test. Default 3.</td>
</tr>
<tr>
<td>verbose</td>
<td>Default TRUE.</td>
</tr>
<tr>
<td>cores</td>
<td>Default 0 (serial). When cores &gt; 0, the benchmark is run in parallel.</td>
</tr>
</tbody>
</table>

References


Description

A collection of matrix benchmark functions

- FFT over 2,500,000 random values.
- Eigenvalues of a 640x640 random matrix.
- Determinant of a 2500x2500 random matrix.
- Cholesky decomposition of a 3000x3000 matrix.
- Inverse of a 1600x1600 random matrix.

These benchmarks have been developed by many authors. See http://r.research.att.com/benchmarks/R-benchmark-25.R for a complete history. The function benchmark_matrix_cal() runs the five bm functions.
Usage

bm_matrix_fun_fft(runs = 3, verbose = TRUE)

bm_matrix_fun_eigen(runs = 3, verbose = TRUE)

bm_matrix_fun_determinant(runs = 3, verbose = TRUE)

bm_matrix_fun_cholesky(runs = 3, verbose = TRUE)

bm_matrix_fun_inverse(runs = 3, verbose = TRUE)

benchmark_matrix_fun(runs = 3, verbose = TRUE, cores = 0L)

Arguments

runs: Number of times to run the test. Default 3.
verbose: Default TRUE.
cores: Default 0 (serial). When cores > 0, the benchmark is run in parallel.

References


bm_parallel

Benchmark in parallel

Description

This function runs benchmarks in parallel to test multithreading

Usage

bm_parallel(bm, runs, verbose, cores, ...)

Arguments

bm: character name of benchmark function to run from get_available_benchmarks
runs: number of runs of benchmark to make
verbose: display messages during benchmarking
cores: number of cores to benchmark. If cores is specified, the benchmark is also run for cores = 1 to allow for normalisation.
... additional arguments to pass to bm
bm_prog_fib

Examples

```r
# Not run:
bm_parallel("bm_matrix_cal_manip", runs = 3, verbose = TRUE, cores = 2)
bm = c("bm_matrix_cal_manip", "bm_matrix_cal_power", "bm_matrix_cal_sort",
       "bm_matrix_cal_cross_product", "bm_matrix_cal_lm")
results = lapply(bm, bm_parallel,
                 runs = 5, verbose = TRUE, cores = 2L)

# End(Not run)
```

Description

A collection of matrix programming benchmark functions

- 3,500,000 Fibonacci numbers calculation (vector calc).
- Creation of a 3500x3500 Hilbert matrix (matrix calc).
- Grand common divisors of 1,000,000 pairs (recursion).
- Creation of a 1600x1600 Toeplitz matrix (loops).
- Escoufier’s method on a 60x60 matrix (mixed).

These benchmarks have been developed by many authors. See http://r.research.att.com/benchmarks/R-benchmark-25.R for a complete history. The function `benchmark_prog()` runs the five bm functions.

Usage

```r
bm_prog_fib(runs = 3, verbose = TRUE)
bm_prog_hilbert(runs = 3, verbose = TRUE)
bm_prog_gcd(runs = 3, verbose = TRUE)
bm_prog_toeplitz(runs = 3, verbose = TRUE)
bm_prog_escoufier(runs = 3, verbose = TRUE)
benchmark_prog(runs = 3, verbose = TRUE, cores = 0L)
```

Arguments

- `runs` Number of times to run the test. Default 3.
- `verbose` Default TRUE.
- `cores` Default 0 (serial). When cores > 0, the benchmark is run in parallel.
Create Bundle

**Description**

This function uploads the benchmarking results. These results will then be incorporated in future versions of the package.

**Usage**

```r
create_bundle(results, filename = NULL, args = NULL, id_prefix = "")
```

```r
upload_results(
  results,
  url = "http://www.mas.ncl.ac.uk/~ncsg3/form.php",
  args = NULL,
  id_prefix = ""
)
```

**Arguments**

- `results` Benchmark results. Probably obtained from `benchmark_std()` or `benchmark_io()`.
- `filename` default `NULL`. A character vector of where to store the results (in an `.rds` file). If `NULL`, results are not saved.
- `args` Default `NULL`. A list of arguments to be passed to `get_sys_details()`.
- `id_prefix` Character string to prefix the benchmark id. Makes it easier to retrieve past results.
- `url` The location of where to upload the results.

**Examples**

```r
## Run benchmarks
## Not run:
res = benchmark_std()
upload_results(res)

## End(Not run)
```
get_available_benchmarks

### Description
The function returns the available benchmarks.

### Usage
get_available_benchmarks()

### Examples
get_available_benchmarks()

---

get_byte_compiler

### Description
Attempts to detect if byte compiling or JIT has been used on the package.

### Usage
get_byte_compiler()

### Details
For R 3.5.0 all packages are byte compiled. Before 3.5.0 it was messy. Sometimes the user would turn it on via JIT, or ByteCompiling the package. On top of that R 3.4.X(?) was byte compiled, but R 3.4.Y(?) was, not fully optimised!!! What this means is don’t trust historical results!

### Value
An integer indicating if byte compiling has been turn on. See ?compiler for details.

### Examples
```r
## Detect if you use byte optimization
get_byte_compiler()
```
get_cpu

**CPU Description**

**Description**

Attempt to extract the CPU model on the current host. This is OS specific:

- Linux: `/proc/cpuinfo`
- Apple: `sysctl -n`
- Solaris: Not implemented.
- Windows: `wmic cpu`

A value of NA is returned if it isn’t possible to obtain the CPU.

**Usage**

`get_cpu()`

**Examples**

```r
## Return the machine CPU
get_cpu()
```

get_linear_algebra

**Get BLAS and LAPACK libraries Extract the blas/lapack from sessionInfo()**

**Description**

Get BLAS and LAPACK libraries Extract the blas/lapack from `sessionInfo()`

**Usage**

`get_linear_algebra()`

get_platform_info

**Platform information**

**Description**

This function just returns the output of `.Platform`

**Usage**

`get_platform_info()`
get_ram

Description

Attempt to extract the amount of RAM on the current machine. This is OS specific:

- Linux: `proc/meminfo`
- Apple: `system_profiler -detailLevel mini`
- Windows: First tries `grep MemTotal /proc/meminfo` then falls back to `wmic MemoryChip get Capacity`
- Solaris: `prtconf`

A value of `NA` is return if it isn't possible to determine the amount of RAM.

Usage

```r
get_ram()
```

References

The `print.bytes` function was taken from the `pryr` package.

Examples

```r
## Return (and pretty print) the amount of RAM
get_ram()
## Display using iec units
print(get_ram(), unit_system = "iec")
```

get_r_version

Description

Returns `unclass(R.version)`

Usage

```r
get_r_version()
```
get_sys_details  General system information

Description
The get_sys_info returns general system level information as a list. The function parameters control the information to upload. If a parameter is set to FALSE, an NA is uploaded instead. Each element of the list contains the output from:

- Sys.info();
- get_platform_info();
- get_r_version();
- get_ram();
- get_cpu();
- get_byte_compiler();
- get_linear_algebra();
- Sys.getlocale()
- installed.packages();
- .Machine
- The package version number;
- Unique ID - used to extract results;
- The current date.

Usage
get_sys_details(
  sys_info = TRUE,
  platform_info = TRUE,
  r_version = TRUE,
  ram = TRUE,
  cpu = TRUE,
  byte_compiler = TRUE,
  linear_algebra = TRUE,
  locale = TRUE,
  installed_packages = TRUE,
  machine = TRUE
)

Arguments
sys_info  Default TRUE.
platform_info  Default TRUE.
r_version  Default TRUE.
## plot.ben_results

### Value

A list

### Examples

```r
## Returns all details about your machine
get_sys_details()
```

### Description

Plotting

### Usage

```r
## S3 method for class 'ben_results'
plot(
x, test_group = unique(x$test_group), blas_optimize = is_blas_optimize(x), log = "y", ...
)
```

### Arguments

- `x` The output from a benchmark_* call.
- `test_group` Default `unique(x$test_group)`. The default behaviour is select the groups from your benchmark results.
- `blas_optimize` Logical. Default The default behaviour is to compare your results with results that use the same blas_optimize setting. To use all results, set to NULL.
- `log` By default the y axis is plotted on the log scale. To change, set the the argument equal to the empty parameter string, "".
- `...` Arguments to be passed to other downstream methods.
Examples

data(sample_results)
plot(sample_results, blas_optimize = NULL)

---

rank_results  Benchmark rankings

Description

Comparison with past results.

Usage

```r
rank_results(
  results,
  blas_optimize = is_blas_optimize(results),
  verbose = TRUE
)
```

Arguments

- `results`: Benchmark results. Probably obtained from `benchmark_std()` or `benchmark_io()`.
- `blas_optimize`: Logical. Default The default behaviour is to compare your results with results that use the same blas_optimize setting. To use all results, set to `NULL`.
- `verbose`: Default `TRUE`.

---

sample_results  Sample benchmarking results

Description

Sample benchmark results. Used in the vignette.

Format

A data frame
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