

A Machine Profile Summary

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Providing a characterization of a particular computing environment for R calculations

If we want to compare results computed on different machines, we need a way to provide measures and identifiers of the particular computing environment at hand. This document attempts to summarize some possibilities available in the R statistical software and language.

Some possible information desired

?? should provide unique names for each info item

Temporal information

Most computations should have a time/date stamp that is unlikely to be confused with any other, at least in combination with a machine name and/or other tags.

?? timestamp

Identifier for the computing environment

- machine name
- operating system and version
- compiler or interpreter version
- specific variations, if any, that should be noted

Hardware information

- cpu
- cores
- operating cycle speed??
- RAM total
- RAM available, possibly indicating swap space and usage
- RAM speed (could be variable)

Software information

?? what to put in.

R tools for machine information

sessionInfo()

```
si <- sessionInfo()
si <- as.vector(si)
si

## R version 4.1.0 (2021-05-18)
## Platform: x86_64-linux-gnu (64-bit)
## Running under: Linux Mint 20.1
##
## Matrix products: default
## BLAS:   /usr/lib/x86_64-linux-gnu/openblas-pthread/libblas.so.3
## LAPACK: /usr/lib/x86_64-linux-gnu/openblas-pthread/liblapack.so.3
##
## locale:
##  [1] LC_CTYPE=en_CA.UTF-8      LC_NUMERIC=C
##  [3] LC_TIME=en_CA.UTF-8      LC_COLLATE=en_CA.UTF-8
##  [5] LC_MONETARY=en_CA.UTF-8  LC_MESSAGES=en_CA.UTF-8
##  [7] LC_PAPER=en_CA.UTF-8     LC_NAME=C
##  [9] LC_ADDRESS=C             LC_TELEPHONE=C
## [11] LC_MEASUREMENT=en_CA.UTF-8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] stats      graphics  grDevices  utils      datasets  methods    base
##
## loaded via a namespace (and not attached):
##  [1] compiler_4.1.0    magrittr_2.0.1    tools_4.1.0      htmltools_0.5.1.1
##  [5] yaml_2.2.1        stringi_1.6.2     rmarkdown_2.8    knitr_1.33
##  [9] stringr_1.4.0     xfun_0.23         digest_0.6.27    rlang_0.4.11
## [13] evaluate_0.14
```

benchmarkme

- uses `proc.time()` for timings
- has single core and parallel timings
- ?? does it do GPUs
- provides far too much for most needs i.e., a succinct summary of how capable a computing system should be

```
library(benchmarkmeData)
library(benchmarkme)
ls(package:benchmarkmeData)

## Warning in ls(package:benchmarkmeData): 'package:benchmarkmeData' converted to
## character string

## [1] "get_datatable_past" "is_blas_optimize"  "make_data_set"
## [4] "move_files"         "past_results"      "past_results_v2"
## [7] "plot_past"          "select_results"    "summarise_results"

ls(package:benchmarkme)

## Warning in ls(package:benchmarkme): 'package:benchmarkme' converted to character
## string

## [1] "benchmark_io"          "benchmark_matrix_cal"
```

```
## [3] "benchmark_matrix_fun"      "benchmark_prog"
## [5] "benchmark_std"             "bm_matrix_cal_cross_product"
## [7] "bm_matrix_cal_lm"          "bm_matrix_cal_manip"
## [9] "bm_matrix_cal_power"        "bm_matrix_cal_sort"
## [11] "bm_matrix_fun_cholesky"     "bm_matrix_fun_determinant"
## [13] "bm_matrix_fun_eigen"        "bm_matrix_fun_fft"
## [15] "bm_matrix_fun_inverse"      "bm_parallel"
## [17] "bm_prog_escoufier"          "bm_prog_fib"
## [19] "bm_prog_gcd"                "bm_prog_hilbert"
## [21] "bm_prog_toeplitz"           "bm_read"
## [23] "bm_write"                   "create_bundle"
## [25] "get_available_benchmarks"    "get_byte_compiler"
## [27] "get_cpu"                    "get_linear_algebra"
## [29] "get_platform_info"          "get_r_version"
## [31] "get_ram"                    "get_sys_details"
## [33] "is_blas_optimize"           "plot_past"
## [35] "rank_results"               "sample_results"
## [37] "upload_results"
```

```
lsf.str("package:benchmarkme")
```

```
## benchmark_io : function (runs = 3, size = c(5, 50), tmpdir = tempdir(), verbose = TRUE,
##     cores = 0L)
## benchmark_matrix_cal : function (runs = 3, verbose = TRUE, cores = 0L)
## benchmark_matrix_fun : function (runs = 3, verbose = TRUE, cores = 0L)
## benchmark_prog : function (runs = 3, verbose = TRUE, cores = 0L)
## benchmark_std : function (runs = 3, verbose = TRUE, cores = 0L)
## bm_matrix_cal_cross_product : function (runs = 3, verbose = TRUE)
## bm_matrix_cal_lm : function (runs = 3, verbose = TRUE)
## bm_matrix_cal_manip : function (runs = 3, verbose = TRUE)
## bm_matrix_cal_power : function (runs = 3, verbose = TRUE)
## bm_matrix_cal_sort : function (runs = 3, verbose = TRUE)
## bm_matrix_fun_cholesky : function (runs = 3, verbose = TRUE)
## bm_matrix_fun_determinant : function (runs = 3, verbose = TRUE)
## bm_matrix_fun_eigen : function (runs = 3, verbose = TRUE)
## bm_matrix_fun_fft : function (runs = 3, verbose = TRUE)
## bm_matrix_fun_inverse : function (runs = 3, verbose = TRUE)
## bm_parallel : function (bm, runs, verbose, cores, ...)
## bm_prog_escoufier : function (runs = 3, verbose = TRUE)
## bm_prog_fib : function (runs = 3, verbose = TRUE)
## bm_prog_gcd : function (runs = 3, verbose = TRUE)
## bm_prog_hilbert : function (runs = 3, verbose = TRUE)
## bm_prog_toeplitz : function (runs = 3, verbose = TRUE)
## bm_read : function (runs = 3, size = c(5, 50), tmpdir = tempdir(), verbose = TRUE)
## bm_write : function (runs = 3, size = c(5, 50), tmpdir = tempdir(), verbose = TRUE)
## create_bundle : function (results, filename = NULL, args = NULL, id_prefix = "")
## get_available_benchmarks : function ()
## get_byte_compiler : function ()
## get_cpu : function ()
## get_linear_algebra : function ()
## get_platform_info : function ()
## get_r_version : function ()
## get_ram : function ()
## get_sys_details : function (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)
## is_blas_optimize : function (results)
## plot_past : function (test_group, blas_optimize = NULL, cores = 0, log = "y")
## rank_results : function (results, blas_optimize = is_blas_optimize(results), verbose = TRUE)
## upload_results : function (results, url = "http://www.mas.ncl.ac.uk/~ncsg3/form.php", args = NULL,
##      id_prefix = "")
lsf.str("package:benchmarkmeData")

## get_datatable_past : function (test_group, blas_optimize = NULL, cores = 0)
## is_blas_optimize : function (results)
## make_data_set : function (from)
## move_files : function (from, to)
## plot_past : function (test_group, blas_optimize = NULL, cores = 0, log = "y")
## select_results : function (test_group, results = NULL, blas_optimize = NULL, cores = 0)
## summarise_results : function (res)
## This next line takes some time
benchmark_std()

## # Programming benchmarks (5 tests):
## 3,500,000 Fibonacci numbers calculation (vector calc): 0.18 (sec).
## Grand common divisors of 1,000,000 pairs (recursion): 0.452 (sec).
## Creation of a 3,500 x 3,500 Hilbert matrix (matrix calc): 0.223 (sec).
## Creation of a 3,000 x 3,000 Toeplitz matrix (loops): 0.95 (sec).
## Escoufier's method on a 60 x 60 matrix (mixed): 0.628 (sec).
## # Matrix calculation benchmarks (5 tests):
## Creation, transp., deformation of a 5,000 x 5,000 matrix: 0.494 (sec).
## 2,500 x 2,500 normal distributed random matrix^1,000: 0.171 (sec).
## Sorting of 7,000,000 random values: 0.577 (sec).
## 2,500 x 2,500 cross-product matrix (b = a' * a): 0.242 (sec).
## Linear regr. over a 5,000 x 500 matrix (c = a \ b'): 0.0227 (sec).
## # Matrix function benchmarks (5 tests):
## Cholesky decomposition of a 3,000 x 3,000 matrix: 0.208 (sec).
## Determinant of a 2,500 x 2,500 random matrix: 0.191 (sec).
## Eigenvalues of a 640 x 640 random matrix: 0.42 (sec).
## FFT over 2,500,000 random values: 0.213 (sec).
## Inverse of a 1,600 x 1,600 random matrix: 0.169 (sec).

##      user system elapsed      test test_group cores
## 1  0.217  0.011  0.228      fib      prog      0
## 2  0.144  0.012  0.156      fib      prog      0
## 3  0.151  0.003  0.155      fib      prog      0
## 4  0.569  0.011  0.580      gcd      prog      0
## 5  0.330  0.000  0.330      gcd      prog      0
## 6  0.426  0.019  0.445      gcd      prog      0
## 7  0.197  0.049  0.246    hilbert      prog      0

```

```

## 8 0.216 0.032 0.247 hilbert prog 0
## 9 0.147 0.028 0.175 hilbert prog 0
## 10 0.963 0.000 0.963 toeplitz prog 0
## 11 0.945 0.000 0.946 toeplitz prog 0
## 12 0.942 0.000 0.942 toeplitz prog 0
## 13 0.617 0.039 0.657 escoufier prog 0
## 14 0.610 0.000 0.611 escoufier prog 0
## 15 0.615 0.000 0.615 escoufier prog 0
## 16 0.506 0.032 0.537 manip matrix_cal 0
## 17 0.515 0.028 0.543 manip matrix_cal 0
## 18 0.350 0.052 0.402 manip matrix_cal 0
## 19 0.162 0.008 0.170 power matrix_cal 0
## 20 0.153 0.020 0.172 power matrix_cal 0
## 21 0.164 0.008 0.172 power matrix_cal 0
## 22 0.571 0.004 0.576 sort matrix_cal 0
## 23 0.568 0.012 0.580 sort matrix_cal 0
## 24 0.573 0.004 0.576 sort matrix_cal 0
## 25 2.455 0.296 0.236 cross_product matrix_cal 0
## 26 2.559 0.191 0.235 cross_product matrix_cal 0
## 27 2.504 0.421 0.256 cross_product matrix_cal 0
## 28 0.241 0.034 0.024 lm matrix_cal 0
## 29 0.189 0.072 0.023 lm matrix_cal 0
## 30 0.228 0.021 0.021 lm matrix_cal 0
## 31 1.815 0.887 0.263 cholesky matrix_fun 0
## 32 1.611 0.284 0.179 cholesky matrix_fun 0
## 33 1.552 0.367 0.182 cholesky matrix_fun 0
## 34 1.874 0.177 0.189 determinant matrix_fun 0
## 35 1.858 0.218 0.192 determinant matrix_fun 0
## 36 1.823 0.255 0.193 determinant matrix_fun 0
## 37 1.611 2.899 0.382 eigen matrix_fun 0
## 38 1.492 3.166 0.396 eigen matrix_fun 0
## 39 1.747 3.795 0.483 eigen matrix_fun 0
## 40 0.207 0.000 0.207 fft matrix_fun 0
## 41 0.213 0.008 0.221 fft matrix_fun 0
## 42 0.210 0.000 0.210 fft matrix_fun 0
## 43 1.565 0.343 0.167 inverse matrix_fun 0
## 44 1.557 0.267 0.161 inverse matrix_fun 0
## 45 1.543 0.479 0.179 inverse matrix_fun 0

```

```
get_byte_compiler()
```

```
## byte_optimize
## 2
```

```
get_linear_algebra()
```

```

## $blas
## [1] "/usr/lib/x86_64-linux-gnu/openblas-pthread/libblas.so.3"
##
## $lapack
## [1] "/usr/lib/x86_64-linux-gnu/openblas-pthread/liblapack.so.3"

```

```
get_sys_details()
```

```

## $sys_info
## $sys_info$sysname

```

```

## [1] "Linux"
##
## $sys_info$release
## [1] "5.4.0-74-generic"
##
## $sys_info$version
## [1] "#83-Ubuntu SMP Sat May 8 02:35:39 UTC 2021"
##
## $sys_info$nodename
## [1] "M21"
##
## $sys_info$machine
## [1] "x86_64"
##
## $sys_info$login
## [1] "unknown"
##
## $sys_info$user
## [1] "john"
##
## $sys_info$effective_user
## [1] "john"
##
##
## $platform_info
## $platform_info$OS.type
## [1] "unix"
##
## $platform_info$file.sep
## [1] "/"
##
## $platform_info$dynlib.ext
## [1] ".so"
##
## $platform_info$GUI
## [1] "X11"
##
## $platform_info$endian
## [1] "little"
##
## $platform_info$pkgType
## [1] "source"
##
## $platform_info$path.sep
## [1] ":"
##
## $platform_info$r_arch
## [1] ""
##
##
## $r_version
## $r_version$platform
## [1] "x86_64-pc-linux-gnu"
##

```

```

## $r_version$arch
## [1] "x86_64"
##
## $r_version$os
## [1] "linux-gnu"
##
## $r_version$system
## [1] "x86_64, linux-gnu"
##
## $r_version$status
## [1] ""
##
## $r_version$major
## [1] "4"
##
## $r_version$minor
## [1] "1.0"
##
## $r_version$year
## [1] "2021"
##
## $r_version$month
## [1] "05"
##
## $r_version$day
## [1] "18"
##
## $r_version$`svn rev`
## [1] "80317"
##
## $r_version$language
## [1] "R"
##
## $r_version$version.string
## [1] "R version 4.1.0 (2021-05-18)"
##
## $r_version$nickname
## [1] "Camp Pontanezen"
##
##
## $ram
## 33.5 GB
##
## $cpu
## $cpu$vendor_id
## [1] "GenuineIntel"
##
## $cpu$model_name
## [1] "Intel(R) Core(TM) i5-10400 CPU @ 2.90GHz"
##
## $cpu$no_of_cores
## [1] 12
##
##

```

```
## $byte_compiler
## byte_optimize
## 2
##
## $linear_algebra
## $linear_algebra$blas
## [1] "/usr/lib/x86_64-linux-gnu/openblas-pthread/libblas.so.3"
##
## $linear_algebra$lapack
## [1] "/usr/lib/x86_64-linux-gnu/openblas-pthread/liblapack.so.3"
##
##
## $locale
## [1] "LC_CTYPE=en_CA.UTF-8;LC_NUMERIC=C;LC_TIME=en_CA.UTF-8;LC_COLLATE=en_CA.UTF-8;LC_MONETARY=en_CA."
##
## $installed_packages
## Package
## askpass "askpass"
## benchmarkme "benchmarkme"
## benchmarkmeData "benchmarkmeData"
## caracas "caracas"
## curl "curl"
## doParallel "doParallel"
## dplyr "dplyr"
## foreach "foreach"
## freetypeharfbuzz "freetypeharfbuzz"
## generics "generics"
## httr "httr"
## iterators "iterators"
## microbenchmark "microbenchmark"
## minpack.lm "minpack.lm"
## nlmrt "nlmrt"
## nlsalt "nlsalt"
## nlspkg "nlspkg"
## nlsr "nlsr"
## numDeriv "numDeriv"
## openssl "openssl"
## png "png"
## pryr "pryr"
## purrr "purrr"
## rappdirs "rappdirs"
## reticulate "reticulate"
## sys "sys"
## tidyselect "tidyselect"
## base64enc "base64enc"
## brio "brio"
## cairoDevice "cairoDevice"
## callr "callr"
## cli "cli"
## cpp11 "cpp11"
## crayon "crayon"
## data.table "data.table"
## desc "desc"
## diffobj "diffobj"
```


## digest	"digest"
## ellipsis	"ellipsis"
## evaluate	"evaluate"
## fansi	"fansi"
## flextable	"flextable"
## fontBitstreamVera	"fontBitstreamVera"
## fontLiberation	"fontLiberation"
## fontquiver	"fontquiver"
## freetypeharfbuzz	"freetypeharfbuzz"
## gdttools	"gdttools"
## glue	"glue"
## highr	"highr"
## htmltools	"htmltools"
## htmlwidgets	"htmlwidgets"
## jsonlite	"jsonlite"
## knitr	"knitr"
## lifecycle	"lifecycle"
## magrittr	"magrittr"
## markdown	"markdown"
## mime	"mime"
## officer	"officer"
## pillar	"pillar"
## pkgconfig	"pkgconfig"
## pkgload	"pkgload"
## praise	"praise"
## processx	"processx"
## ps	"ps"
## R6	"R6"
## Rcpp	"Rcpp"
## rematch2	"rematch2"
## rJava	"rJava"
## rjson	"rjson"
## rJython	"rJython"
## rlang	"rlang"
## rmarkdown	"rmarkdown"
## rprojroot	"rprojroot"
## rstudioapi	"rstudioapi"
## rSymPy	"rSymPy"
## stringi	"stringi"
## stringr	"stringr"
## systemfonts	"systemfonts"
## testthat	"testthat"
## tibble	"tibble"
## tinytex	"tinytex"
## utf8	"utf8"
## uuid	"uuid"
## vctrs	"vctrs"
## waldo	"waldo"
## withr	"withr"
## xfun	"xfun"
## xml2	"xml2"
## yaml	"yaml"
## zip	"zip"
## base	"base"

## boot	"boot"
## class	"class"
## cluster	"cluster"
## codetools	"codetools"
## compiler	"compiler"
## datasets	"datasets"
## foreign	"foreign"
## graphics	"graphics"
## grDevices	"grDevices"
## grid	"grid"
## KernSmooth	"KernSmooth"
## lattice	"lattice"
## MASS	"MASS"
## Matrix	"Matrix"
## methods	"methods"
## mgcv	"mgcv"
## nlme	"nlme"
## nnet	"nnet"
## parallel	"parallel"
## rpart	"rpart"
## spatial	"spatial"
## splines	"splines"
## stats	"stats"
## stats4	"stats4"
## survival	"survival"
## tcltk	"tcltk"
## tools	"tools"
## utils	"utils"
##	LibPath Version
## askpass	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.1"
## benchmarkme	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.0.7"
## benchmarkmeData	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.0.4"
## caracas	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.1.0"
## curl	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "4.3.1"
## doParallel	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.0.16"
## dplyr	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.0.6"
## foreach	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.5.1"
## freetypeharfbuzz	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "0.2.6"
## generics	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "0.1.0"
## httr	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.4.2"
## iterators	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.0.13"
## microbenchmark	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.4-7"
## minpack.lm	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.2-1"
## nlmrt	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "2016.3.2"
## nlsalt	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "0.1.0"
## nlspkg	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "0.1.0"
## nlsrc	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "2019.9.7"
## numDeriv	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "2016.8-1.1"
## openssl	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.4.4"
## png	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "0.1-7"
## pryr	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "0.1.4"
## purrr	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "0.3.4"
## rappdirs	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "0.3.3"
## reticulate	"/home/john/R/x86_64-pc-linux-gnu-library/4.1" "1.20"

## sys	"/home/john/R/x86_64-pc-linux-gnu-library/4.1"	"3.4"
## tidyselect	"/home/john/R/x86_64-pc-linux-gnu-library/4.1"	"1.1.1"
## base64enc	"/usr/lib/R/site-library"	"0.1-3"
## brio	"/usr/lib/R/site-library"	"1.1.2"
## cairoDevice	"/usr/lib/R/site-library"	"2.28.2"
## callr	"/usr/lib/R/site-library"	"3.7.0"
## cli	"/usr/lib/R/site-library"	"2.5.0"
## cpp11	"/usr/lib/R/site-library"	"0.2.7"
## crayon	"/usr/lib/R/site-library"	"1.4.1"
## data.table	"/usr/lib/R/site-library"	"1.14.0"
## desc	"/usr/lib/R/site-library"	"1.3.0"
## diffobj	"/usr/lib/R/site-library"	"0.3.4"
## digest	"/usr/lib/R/site-library"	"0.6.27"
## ellipsis	"/usr/lib/R/site-library"	"0.3.2"
## evaluate	"/usr/lib/R/site-library"	"0.14"
## fansi	"/usr/lib/R/site-library"	"0.5.0"
## flextable	"/usr/lib/R/site-library"	"0.6.6"
## fontBitstreamVera	"/usr/lib/R/site-library"	"0.1.1"
## fontLiberation	"/usr/lib/R/site-library"	"0.1.0"
## fontquiver	"/usr/lib/R/site-library"	"0.2.1"
## freetypeharfbuzz	"/usr/lib/R/site-library"	"0.2.5"
## gdttools	"/usr/lib/R/site-library"	"0.2.3"
## glue	"/usr/lib/R/site-library"	"1.4.2"
## highr	"/usr/lib/R/site-library"	"0.9"
## htmltools	"/usr/lib/R/site-library"	"0.5.1.1"
## htmlwidgets	"/usr/lib/R/site-library"	"1.5.3"
## jsonlite	"/usr/lib/R/site-library"	"1.7.2"
## knitr	"/usr/lib/R/site-library"	"1.33"
## lifecycle	"/usr/lib/R/site-library"	"1.0.0"
## magrittr	"/usr/lib/R/site-library"	"2.0.1"
## markdown	"/usr/lib/R/site-library"	"1.1"
## mime	"/usr/lib/R/site-library"	"0.10"
## officer	"/usr/lib/R/site-library"	"0.3.18"
## pillar	"/usr/lib/R/site-library"	"1.6.1"
## pkgconfig	"/usr/lib/R/site-library"	"2.0.3"
## pkgload	"/usr/lib/R/site-library"	"1.2.1"
## praise	"/usr/lib/R/site-library"	"1.0.0"
## processx	"/usr/lib/R/site-library"	"3.5.2"
## ps	"/usr/lib/R/site-library"	"1.6.0"
## R6	"/usr/lib/R/site-library"	"2.5.0"
## Rcpp	"/usr/lib/R/site-library"	"1.0.6"
## rematch2	"/usr/lib/R/site-library"	"2.1.2"
## rJava	"/usr/lib/R/site-library"	"1.0-4"
## rjson	"/usr/lib/R/site-library"	"0.2.20"
## rJython	"/usr/lib/R/site-library"	"0.0-4"
## rlang	"/usr/lib/R/site-library"	"0.4.11"
## rmarkdown	"/usr/lib/R/site-library"	"2.8"
## rprojroot	"/usr/lib/R/site-library"	"2.0.2"
## rstudioapi	"/usr/lib/R/site-library"	"0.13"
## rSymPy	"/usr/lib/R/site-library"	"0.2-1.2"
## stringi	"/usr/lib/R/site-library"	"1.6.2"
## stringr	"/usr/lib/R/site-library"	"1.4.0"
## systemfonts	"/usr/lib/R/site-library"	"1.0.2"
## testthat	"/usr/lib/R/site-library"	"3.0.2"

## tibble	"/usr/lib/R/site-library"	"3.1.2"
## tinytex	"/usr/lib/R/site-library"	"0.32"
## utf8	"/usr/lib/R/site-library"	"1.2.1"
## uuid	"/usr/lib/R/site-library"	"0.1-4"
## vctrs	"/usr/lib/R/site-library"	"0.3.8"
## waldo	"/usr/lib/R/site-library"	"0.2.5"
## withr	"/usr/lib/R/site-library"	"2.4.2"
## xfun	"/usr/lib/R/site-library"	"0.23"
## xml2	"/usr/lib/R/site-library"	"1.3.2"
## yaml	"/usr/lib/R/site-library"	"2.2.1"
## zip	"/usr/lib/R/site-library"	"2.2.0"
## base	"/usr/lib/R/library"	"4.1.0"
## boot	"/usr/lib/R/library"	"1.3-28"
## class	"/usr/lib/R/library"	"7.3-19"
## cluster	"/usr/lib/R/library"	"2.1.2"
## codetools	"/usr/lib/R/library"	"0.2-18"
## compiler	"/usr/lib/R/library"	"4.1.0"
## datasets	"/usr/lib/R/library"	"4.1.0"
## foreign	"/usr/lib/R/library"	"0.8-81"
## graphics	"/usr/lib/R/library"	"4.1.0"
## grDevices	"/usr/lib/R/library"	"4.1.0"
## grid	"/usr/lib/R/library"	"4.1.0"
## KernSmooth	"/usr/lib/R/library"	"2.23-20"
## lattice	"/usr/lib/R/library"	"0.20-44"
## MASS	"/usr/lib/R/library"	"7.3-54"
## Matrix	"/usr/lib/R/library"	"1.3-4"
## methods	"/usr/lib/R/library"	"4.1.0"
## mgcv	"/usr/lib/R/library"	"1.8-36"
## nlme	"/usr/lib/R/library"	"3.1-152"
## nnet	"/usr/lib/R/library"	"7.3-16"
## parallel	"/usr/lib/R/library"	"4.1.0"
## rpart	"/usr/lib/R/library"	"4.1-15"
## spatial	"/usr/lib/R/library"	"7.3-14"
## splines	"/usr/lib/R/library"	"4.1.0"
## stats	"/usr/lib/R/library"	"4.1.0"
## stats4	"/usr/lib/R/library"	"4.1.0"
## survival	"/usr/lib/R/library"	"3.2-11"
## tcltk	"/usr/lib/R/library"	"4.1.0"
## tools	"/usr/lib/R/library"	"4.1.0"
## utils	"/usr/lib/R/library"	"4.1.0"
##	Priority	
## askpass	NA	
## benchmarkme	NA	
## benchmarkmeData	NA	
## caracas	NA	
## curl	NA	
## doParallel	NA	
## dplyr	NA	
## foreach	NA	
## freetypeharfbuzz	NA	
## generics	NA	
## httr	NA	
## iterators	NA	
## microbenchmark	NA	

## minpack.lm	NA
## nlmrt	NA
## nlsalt	NA
## nlspkg	NA
## nlsr	NA
## numDeriv	NA
## openssl	NA
## png	NA
## pryr	NA
## purrr	NA
## rappdirs	NA
## reticulate	NA
## sys	NA
## tidyselect	NA
## base64enc	NA
## brio	NA
## cairoDevice	NA
## callr	NA
## cli	NA
## cpp11	NA
## crayon	NA
## data.table	NA
## desc	NA
## diffobj	NA
## digest	NA
## ellipsis	NA
## evaluate	NA
## fansi	NA
## flextable	NA
## fontBitstreamVera	NA
## fontLiberation	NA
## fontquiver	NA
## freetypeharfbuzz	NA
## gdtools	NA
## glue	NA
## highr	NA
## htmltools	NA
## htmlwidgets	NA
## jsonlite	NA
## knitr	NA
## lifecycle	NA
## magrittr	NA
## markdown	NA
## mime	NA
## officer	NA
## pillar	NA
## pkgconfig	NA
## pkgload	NA
## praise	NA
## processx	NA
## ps	NA
## R6	NA
## Rcpp	NA
## rematch2	NA

## rJava	NA
## rjson	NA
## rJython	NA
## rlang	NA
## rmarkdown	NA
## rprojroot	NA
## rstudioapi	NA
## rSymPy	NA
## stringi	NA
## stringr	NA
## systemfonts	NA
## testthat	NA
## tibble	NA
## tinytex	NA
## utf8	NA
## uuid	NA
## vctrs	NA
## waldo	NA
## withr	NA
## xfun	NA
## xml2	NA
## yaml	NA
## zip	NA
## base	"base"
## boot	"recommended"
## class	"recommended"
## cluster	"recommended"
## codetools	"recommended"
## compiler	"base"
## datasets	"base"
## foreign	"recommended"
## graphics	"base"
## grDevices	"base"
## grid	"base"
## KernSmooth	"recommended"
## lattice	"recommended"
## MASS	"recommended"
## Matrix	"recommended"
## methods	"base"
## mgcv	"recommended"
## nlme	"recommended"
## nnet	"recommended"
## parallel	"base"
## rpart	"recommended"
## spatial	"recommended"
## splines	"base"
## stats	"base"
## stats4	"base"
## survival	"recommended"
## tcltk	"base"
## tools	"base"
## utils	"base"
##	Depends
## askpass	NA

```

## benchmarkme      "R (>= 3.5.0)"
## benchmarkmeData  "R (>= 3.5.0)"
## caracas          "R (>= 3.0), methods"
## curl             "R (>= 3.0.0)"
## doParallel       "R (>= 2.14.0), foreach(>= 1.2.0), iterators(>= 1.0.0), \nparallel, utils"
## dplyr            "R (>= 3.3.0)"
## foreach          "R (>= 2.5.0)"
## freetypeharfbuzz "R (>= 3.2)"
## generics         "R (>= 3.1)"
## httr             "R (>= 3.2)"
## iterators        "R (>= 2.5.0), utils"
## microbenchmark   NA
## minpack.lm       NA
## nlrmrt           "R (>= 2.15.0)"
## nlsalt           NA
## nlspkg           NA
## nlsr             "R (>= 3.0)"
## numDeriv         "R (>= 2.11.1)"
## openssl          NA
## png              "R (>= 2.9.0)"
## pryr             "R (>= 3.1.0)"
## purrr            "R (>= 3.2)"
## rappdirs         "R (>= 3.2)"
## reticulate       "R (>= 3.0)"
## sys              NA
## tidyselect       "R (>= 3.2)"
## base64enc        "R (>= 2.9.0)"
## brio             NA
## cairoDevice      "R (>= 2.12.0)"
## callr            NA
## cli              "R (>= 2.10)"
## cpp11            NA
## crayon           NA
## data.table       "R (>= 3.1.0)"
## desc             "R (>= 3.1.0)"
## diffobj          "R (>= 3.1.0)"
## digest           "R (>= 3.3.0)"
## ellipsis         "R (>= 3.2)"
## evaluate         "R (>= 3.0.2)"
## fansi            "R (>= 3.1.0)"
## flextable        NA
## fontBitstreamVera "R (>= 3.0.0)"
## fontLiberation   "R (>= 3.0)"
## fontquiver       "R (>= 3.0.0)"
## freetypeharfbuzz "R (>= 3.2)"
## gdtools          NA
## glue             "R (>= 3.2)"
## highr            "R (>= 3.2.3)"
## htmltools        "R (>= 2.14.1)"
## htmlwidgets      NA
## jsonlite         "methods"
## knitr            "R (>= 3.2.3)"
## lifecycle        "R (>= 3.3)"
## magrittr         NA

```

```

## markdown      "R (>= 2.11.1)"
## mime          NA
## officer       NA
## pillar        NA
## pkgconfig     NA
## pkgload       NA
## praise        NA
## processx      NA
## ps            "R (>= 3.1)"
## R6            "R (>= 3.0)"
## Rcpp          NA
## rematch2      NA
## rJava         "R (>= 3.6.0), methods"
## rjson         "R (>= 3.1.0)"
## rJython       "rJava (>= 0.8-1), rjson (>= 0.1.9)"
## rlang         "R (>= 3.3.0)"
## rmarkdown     "R (>= 3.0)"
## rprojroot     "R (>= 3.0.0)"
## rstudioapi    NA
## rSymPy        "rJython"
## stringi       "R (>= 3.1)"
## stringr       "R (>= 3.1)"
## systemfonts   "R (>= 3.2.0)"
## testthat      "R (>= 3.1)"
## tibble        "R (>= 3.1.0)"
## tinytex       NA
## utf8          "R (>= 2.10)"
## uuid          "R (>= 2.9.0)"
## vctrs         "R (>= 3.3)"
## waldo         NA
## withr         "R (>= 3.2.0)"
## xfun          NA
## xml2          "R (>= 3.1.0)"
## yaml          NA
## zip           NA
## base          NA
## boot          "R (>= 3.0.0), graphics, stats"
## class         "R (>= 3.0.0), stats, utils"
## cluster       "R (>= 3.4.0)"
## codetools     "R (>= 2.1)"
## compiler      NA
## datasets      NA
## foreign       "R (>= 4.0.0)"
## graphics      NA
## grDevices     NA
## grid          NA
## KernSmooth    "R (>= 2.5.0), stats"
## lattice       "R (>= 3.0.0)"
## MASS          "R (>= 3.3.0), grDevices, graphics, stats, utils"
## Matrix        "R (>= 3.5.0)"
## methods       NA
## mgcv          "R (>= 3.6.0), nlme (>= 3.1-64)"
## nlme          "R (>= 3.4.0)"
## nnet          "R (>= 3.0.0), stats, utils"

```



```

## parallel      NA
## rpart         "R (>= 2.15.0), graphics, stats, grDevices"
## spatial       "R (>= 3.0.0), graphics, stats, utils"
## splines       NA
## stats         NA
## stats4        NA
## survival      "R (>= 3.5.0)"
## tcltk         NA
## tools         NA
## utils         NA
##              Imports
## askpass       "sys (>= 2.1)"
## benchmarkme   "benchmarkmeData (>= 1.0.4), compiler, doParallel, dplyr,\nforeach, graphics, http"
## benchmarkmeData "dplyr, graphics, tibble, utils"
## caracas       "reticulate (>= 1.14), magrittr"
## curl          NA
## doParallel    NA
## dplyr         "ellipsis, generics, glue (>= 1.3.2), lifecycle (>= 1.0.0),\nmagrittr (>= 1.5), me"
## foreach       "codetools, utils, iterators"
## freetypeharfbuzz "fontquiver"
## generics      "methods"
## httr          "curl (>= 3.0.0), jsonlite, mime, openssl (>= 0.8), R6"
## iterators     NA
## microbenchmark "graphics, stats"
## minpack.lm    NA
## nlrmrt        NA
## nlsalt        "graphics, stats"
## nlspkg        "graphics, stats"
## nlsrc         "digest"
## numDeriv      NA
## openssl       "askpass"
## png           NA
## pryr          "stringr, codetools, methods, Rcpp (>= 0.11.0)"
## purrr         "magrittr (>= 1.5), rlang (>= 0.3.1)"
## rappdirs      NA
## reticulate     "Matrix, Rcpp (>= 0.12.7), graphics, jsonlite, methods, png,\nrappdirs, utils, with"
## sys           NA
## tidyselect     "ellipsis, glue (>= 1.3.0), purrr (>= 0.3.2), rlang (>= 0.4.6),\nvctrs (>= 0.3.0)"
## base64enc      NA
## brio          NA
## cairoDevice    "grDevices"
## callr         "processx (>= 3.5.0), R6, utils"
## cli           "glue, utils"
## cpp11         NA
## crayon        "grDevices, methods, utils"
## data.table     "methods"
## desc          "utils, R6, crayon, rprojroot"
## diffobj       "crayon (>= 1.3.2), tools, methods, utils, stats"
## digest        "utils"
## ellipsis      "rlang (>= 0.3.0)"
## evaluate      "methods"
## fansi         "grDevices, utils"
## flextable     "stats, utils, grDevices, graphics, officer (>= 0.3.17),\nrmarkdown, knitr, htmlto"
## fontBitstreamVera NA

```

```

## fontLiberation      NA
## fontquiver          "fontBitstreamVera (>= 0.1.0), fontLiberation (>= 0.1.0)"
## freetypeharfbuzz    "fontquiver"
## gdttools            "Rcpp (>= 0.12.12), systemfonts (>= 0.1.1)"
## glue                "methods"
## highr               "xfun (>= 0.18)"
## htmltools           "utils, digest, grDevices, base64enc, rlang"
## htmlwidgets         "grDevices, htmltools (>= 0.3), jsonlite (>= 0.9.16), yaml"
## jsonlite            NA
## knitr               "evaluate (>= 0.10), highr, methods, markdown, stringr (>= \n0.6), yaml (>= 2.1.19)"
## lifecycle           "glue, rlang (>= 0.4.10)"
## magrittr            NA
## markdown            "utils, xfun, mime (>= 0.3)"
## mime                "tools"
## officer             "R6, grDevices, stats, graphics, utils, zip (>= 2.1.0), uuid\n(>= 0.1-4), xml2 (>= 2.1.1)"
## pillar              "cli, crayon (>= 1.3.4), ellipsis (>= 0.3.2), fansi, lifecycle,\nrlang (>= 0.3.0),
## pkgconfig           "utils"
## pkgload             "cli, crayon, desc, methods, rlang, rprojroot, rstudioapi,\nutils, withr"
## praise              NA
## processx            "ps (>= 1.2.0), R6, utils"
## ps                  "utils"
## R6                  NA
## Rcpp                "methods, utils"
## rematch2            "tibble"
## rJava               NA
## rjson               NA
## rJython             NA
## rlang               "utils"
## rmarkdown           "tools, utils, knitr (>= 1.22), yaml (>= 2.1.19), htmltools (>= \n0.3.5), evaluate"
## rprojroot           NA
## rstudioapi          NA
## rSymPy              NA
## stringi             "tools, utils, stats"
## stringr             "glue (>= 1.2.0), magrittr, stringi (>= 1.1.7)"
## systemfonts         NA
## testthat            "brio, callr (>= 3.5.1), cli (>= 2.2.0), crayon (>= 1.3.4),\ndesc, digest, ellipsis"
## tibble              "ellipsis (>= 0.3.2), fansi (>= 0.4.0), lifecycle (>= 0.2.0),\nmagrittr, methods, p"
## tinytex             "xfun (>= 0.23)"
## utf8                NA
## uuid                NA
## vctrs               "ellipsis (>= 0.2.0), glue, rlang (>= 0.4.10)"
## waldo               "cli, diffobj, fansi, glue, methods, rematch2, rlang (>= \n0.4.10), tibble"
## withr               "graphics, grDevices, stats"
## xfun                "stats, tools"
## xml2                "methods"
## yaml                NA
## zip                 NA
## base                NA
## boot                NA
## class               "MASS"
## cluster             "graphics, grDevices, stats, utils"
## codetools           NA
## compiler            NA
## datasets            NA

```

```

## foreign          "methods, utils, stats"
## graphics         "grDevices"
## grDevices        NA
## grid             "grDevices, utils"
## KernSmooth       NA
## lattice          "grid, grDevices, graphics, stats, utils"
## MASS             "methods"
## Matrix           "methods, graphics, grid, stats, utils, lattice"
## methods          "utils, stats"
## mgcv             "methods, stats, graphics, Matrix, splines, utils"
## nlme             "graphics, stats, utils, lattice"
## nnet             NA
## parallel         "tools, compiler"
## rpart            NA
## spatial          NA
## splines          "graphics, stats"
## stats            "utils, grDevices, graphics"
## stats4           "graphics, methods, stats"
## survival         "graphics, Matrix, methods, splines, stats, utils"
## tcltk            "utils"
## tools            NA
## utils            NA
##                 LinkingTo
## askpass          NA
## benchmarkme      NA
## benchmarkmeData NA
## caracas          NA
## curl             NA
## doParallel       NA
## dplyr            NA
## foreach          NA
## freetypeharfbuzz NA
## generics         NA
## httr             NA
## iterators        NA
## microbenchmark  NA
## minpack.lm       NA
## nlmrt            NA
## nlsalt           NA
## nlspkg           NA
## nlsrc            NA
## numDeriv         NA
## openssl          NA
## png              NA
## pryr             "Rcpp"
## purrr            NA
## rappdirs         NA
## reticulate       "Rcpp"
## sys              NA
## tidyselect       NA
## base64enc        NA
## brio             NA
## cairoDevice      NA
## callr            NA

```

## cli	NA
## cpp11	NA
## crayon	NA
## data.table	NA
## desc	NA
## diffobj	NA
## digest	NA
## ellipsis	NA
## evaluate	NA
## fansi	NA
## flextable	NA
## fontBitstreamVera	NA
## fontLiberation	NA
## fontquiver	NA
## freetypeharfbuzz	NA
## gdtools	"Rcpp"
## glue	NA
## highr	NA
## htmltools	NA
## htmlwidgets	NA
## jsonlite	NA
## knitr	NA
## lifecycle	NA
## magrittr	NA
## markdown	NA
## mime	NA
## officer	NA
## pillar	NA
## pkgconfig	NA
## pkgload	NA
## praise	NA
## processx	NA
## ps	NA
## R6	NA
## Rcpp	NA
## rematch2	NA
## rJava	NA
## rjson	NA
## rJython	NA
## rlang	NA
## rmarkdown	NA
## rprojroot	NA
## rstudioapi	NA
## rSymPy	NA
## stringi	NA
## stringr	NA
## systemfonts	"cpp11 (>= 0.2.1)"
## testthat	NA
## tibble	NA
## tinytex	NA
## utf8	NA
## uuid	NA
## vctrs	NA
## waldo	NA

```

## withr                NA
## xfun                  NA
## xml2                  NA
## yaml                  NA
## zip                    NA
## base                   NA
## boot                   NA
## class                  NA
## cluster                NA
## codetools              NA
## compiler               NA
## datasets               NA
## foreign                NA
## graphics               NA
## grDevices              NA
## grid                   NA
## KernSmooth             NA
## lattice                NA
## MASS                   NA
## Matrix                 NA
## methods                NA
## mgcv                   NA
## nlme                   NA
## nnet                   NA
## parallel              NA
## rpart                  NA
## spatial                NA
## splines                NA
## stats                  NA
## stats4                 NA
## survival               NA
## tcltk                  NA
## tools                  NA
## utils                  NA
##                        Suggests
## askpass                "testthat"
## benchmarkme            "covr, DT, ggplot2, knitr, RcppZigurat, rmarkdown, testthat"
## benchmarkmeData        "benchmarkme, covr, DT, testthat"
## caracas                "Matrix, testthat (>= 2.1.0), knitr, rmarkdown"
## curl                   "spelling, testthat (>= 1.0.0), knitr, jsonlite, rmarkdown,\nmagrittr, httpuv (>=
## doParallel             "caret, mlbench, rpart, RUnit"
## dplyr                  "bench, broom, callr, covr, DBI, dbplyr (>= 1.4.3), knitr,\nLahman, lobstr, microb
## foreach                "randomForest, doMC, doParallel, testthat, knitr, rmarkdown"
## freetypeharfbuzz       "covr, testthat"
## generics               "covr, pkgload, testthat, tibble"
## httr                   "covr, httpuv, jpeg, knitr, png, readr, rmarkdown, testthat\n(>= 0.8.0), xml2"
## iterators              "RUnit, foreach"
## microbenchmark         "ggplot2, multcomp, RUnit"
## minpack.lm             "MASS"
## nlmrt                  "minpack.lm, optimx, Rvmmin, Rcgmin, numDeriv"
## nlsalt                 "MASS"
## nlspkg                 "MASS"
## nlsr                   "minpack.lm, optimx, Rvmmin, Rcgmin, numDeriv, knitr,\nrmmarkdown, Ryacas, Deriv"
## numDeriv               NA

```

```

## openssl      "testthat (>= 2.1.0), digest, knitr, rmarkdown, jsonlite,\njose, sodium"
## png          NA
## pryr         "testthat (>= 0.8.0)"
## purrr        "covr, crayon, dplyr (>= 0.7.8), knitr, rmarkdown, testthat,\ntibble, tidyselect"
## rappdirs     "roxygen2, testthat (>= 3.0.0), covr, withr"
## reticulate   "callr, knitr, rmarkdown, testthat"
## sys          "unix (>= 1.4), spelling, testthat"
## tidyselect   "covr, crayon, dplyr, knitr, magrittr, rmarkdown, testthat (>=\n2.3.0), tibble (>=
## base64enc    NA
## brio         "testthat (>= 2.1.0), covr"
## cairoDevice  NA
## callr        "cli, covr, ps, rprojroot, spelling, testthat, withr (>=\n2.3.0)"
## cli          "callr, covr, grDevices, htmlwidgets, knitr, methods, mockery,\nps (>= 1.3.4.9000)
## cpp11        "bench, brio, callr, cli, covr, decor, desc, ggplot2, glue,\nknitr, lobstr, mockery
## crayon       "mockery, rstudioapi, testthat, withr"
## data.table   "bit64 (>= 4.0.0), bit (>= 4.0.4), curl, R.utils, xts,\nnanotime, zoo (>= 1.8-1),
## desc         "covr, testthat, whoami, withr, spelling, gh"
## diffobj      "knitr, rmarkdown"
## digest       "tinytest, knitr, rmarkdown, minidown"
## ellipsis     "covr, testthat"
## evaluate     "testthat, lattice, ggplot2"
## fansi        "unitizer, knitr, rmarkdown"
## flextable    "testthat (>= 2.1.0), xtable, webshot, magick, ggplot2,\nnscales, broom, mgcv, book
## fontBitstreamVera NA
## fontLiberation NA
## fontquiver   "testthat, htmltools"
## freetypeharfbuzz "covr, testthat"
## gdtools      "htmltools, testthat, fontquiver (>= 0.2.0), curl"
## glue         "testthat, covr, magrittr, crayon, knitr, rmarkdown, DBI,\nRSQLite, R.utils, forca
## highr        "knitr, markdown, testit"
## htmltools     "markdown, testthat, withr, Cairo, ragg, shiny"
## htmlwidgets  "knitr (>= 1.8), rmarkdown, testthat"
## jsonlite     "httr, curl, plyr, testthat, knitr, rmarkdown, R.rsp, sf"
## knitr        "formatR, testit, digest, rgl (>= 0.95.1201), codetools,\nrmmarkdown, htmlwidgets (
## lifecycle    "covr, crayon, knitr, rmarkdown, testthat (>= 3.0.1), tibble"
## magrittr     "covr, knitr, rlang, rmarkdown, testthat"
## markdown     "knitr, RCurl"
## mime         NA
## officer      "testthat, devEMF, ggplot2, rmarkdown, base64enc, knitr, rsvg"
## pillar       "bit64, debugme, DiagrammeR, dplyr, formattable, ggplot2,\nknitr, lubridate, nycfl
## pkgconfig    "covr, testthat, disposables (>= 1.0.3)"
## pkgload      "bitops, covr, pkgbuild, Rcpp, testthat"
## praise       "testthat"
## processx     "callr (>= 3.2.0), cli, codetools, covr, curl, debugme,\nparallel, testthat, withr
## ps           "callr, covr, curl, pingr, processx (>= 3.1.0), R6, rlang,\ntestthat, tibble"
## R6           "knitr, microbenchmark, pryr, testthat, ggplot2, scales"
## Rcpp         "tinytest, inline, rbenchmark, pkgKitten (>= 0.1.2)"
## rematch2     "covr, testthat"
## rJava        NA
## rjson        NA
## rJython      NA
## rlang        "cli, covr, crayon, glue, magrittr, methods, pak, pillar,\nrmmarkdown, testthat (>=
## rmarkdown    "shiny (>= 1.6.0), tufte, testthat (>= 3.0.0), digest,\nndygraphs, vctrs, tibble, f
## rprojroot    "covr, knitr, lifecycle, mockr, rmarkdown, testthat (>=\n3.0.0), withr"

```

```

## rstudioapi      "testthat, knitr, rmarkdown, clipr"
## rSymPy          NA
## stringi         NA
## stringr         "covr, htmltools, htmlwidgets, knitr, rmarkdown, testthat"
## systemfonts     "testthat (>= 2.1.0), covr, knitr, rmarkdown, tools"
## testthat        "covr, curl (>= 0.9.5), diffviewer (>= 0.1.0), knitr, mockery,\nrmarkdown, rstudioapi"
## tibble          "bench, bit64, blob, cli, covr, crayon (>= 1.3.4), DiagrammeR,\nndplyr, evaluate, forcats"
## tinytex         "testit, rstudioapi"
## utf8            "covr, knitr, rlang, rmarkdown, testthat (>= 3.0.0)"
## uuid            NA
## vctrs           "bit64, covr, crayon, dplyr (>= 0.8.5), generics, knitr,\nnpillar (>= 1.4.4), pkgdown"
## waldo           "testthat (>= 3.0.0), covr, R6"
## withr           "covr, DBI, knitr, lattice, methods, rmarkdown, RSQLite,\nntestthat (>= 2.1.0)"
## xfun            "testit, parallel, codetools, rstudioapi, tinytex (>= 0.30),\n\nmime, markdown, knitr"
## xml2            "covr, curl, httr, knitr, magrittr, mockery, rmarkdown,\nntestthat (>= 2.1.0)"
## yaml            "RUnit"
## zip             "covr, processx, R6, testthat, withr"
## base            "methods"
## boot            "MASS, survival"
## class           NA
## cluster         "MASS, Matrix"
## codetools       NA
## compiler        NA
## datasets        NA
## foreign         NA
## graphics        NA
## grDevices       "KernSmooth"
## grid            "lattice"
## KernSmooth      "MASS, carData"
## lattice         "KernSmooth, MASS, latticeExtra"
## MASS            "lattice, nlme, nnet, survival"
## Matrix          "expm, MASS"
## methods         "codetools"
## mgcv            "parallel, survival, MASS"
## nlme            "Hmisc, MASS"
## nnet            "MASS"
## parallel        "methods"
## rpart           "survival"
## spatial         "MASS"
## splines         "Matrix, methods"
## stats           "MASS, Matrix, SuppDists, methods, stats4"
## stats4          NA
## survival        NA
## tcltk           NA
## tools           "codetools, methods, xml2, curl, commonmark"
## utils           "methods, xml2, commonmark"
##                Enhances
## askpass         NA
## benchmarkme     NA
## benchmarkmeData NA
## caracas         NA
## curl            NA
## doParallel      "compiler"
## dplyr           NA

```

## foreach	NA
## freetypeharfbuzz	NA
## generics	NA
## httr	NA
## iterators	NA
## microbenchmark	NA
## minpack.lm	NA
## nlmrt	NA
## nlsalt	NA
## nlspkg	NA
## nlsr	NA
## numDeriv	NA
## openssl	NA
## png	NA
## pryr	NA
## purrr	NA
## rappdirs	NA
## reticulate	NA
## sys	NA
## tidyselect	NA
## base64enc	"png"
## brio	NA
## cairoDevice	NA
## callr	NA
## cli	NA
## cpp11	NA
## crayon	NA
## data.table	NA
## desc	NA
## diffobj	NA
## digest	NA
## ellipsis	NA
## evaluate	NA
## fansi	NA
## flextable	NA
## fontBitstreamVera	NA
## fontLiberation	NA
## fontquiver	NA
## freetypeharfbuzz	NA
## gdtools	NA
## glue	NA
## highr	NA
## htmltools	"knitr"
## htmlwidgets	"shiny (>= 1.1)"
## jsonlite	NA
## knitr	NA
## lifecycle	NA
## magrittr	NA
## markdown	NA
## mime	NA
## officer	NA
## pillar	NA
## pkgconfig	NA
## pkgload	NA

## praise	NA
## processx	NA
## ps	NA
## R6	NA
## Rcpp	NA
## rematch2	NA
## rJava	NA
## rjson	NA
## rJython	NA
## rlang	"winch"
## rmarkdown	NA
## rprojroot	NA
## rstudioapi	NA
## rSymPy	NA
## stringi	NA
## stringr	NA
## systemfonts	NA
## testthat	NA
## tibble	NA
## tinytex	NA
## utf8	NA
## uuid	NA
## vctrs	NA
## waldo	NA
## withr	NA
## xfun	NA
## xml2	NA
## yaml	NA
## zip	NA
## base	NA
## boot	NA
## class	NA
## cluster	NA
## codetools	NA
## compiler	NA
## datasets	NA
## foreign	NA
## graphics	NA
## grDevices	NA
## grid	NA
## KernSmooth	NA
## lattice	"chron"
## MASS	NA
## Matrix	"MatrixModels, graph, SparseM, sfsmisc, igraph, maptools, sp,\nspdep"
## methods	NA
## mgcv	NA
## nlme	NA
## nnet	NA
## parallel	"snow, nws, Rmpi"
## rpart	NA
## spatial	NA
## splines	NA
## stats	NA
## stats4	NA

## survival	NA	
## tcltk	NA	
## tools	NA	
## utils	NA	
##	License	License_is_FOSS
## askpass	"MIT + file LICENSE"	NA
## benchmarkme	"GPL-2 GPL-3"	NA
## benchmarkmeData	"GPL-2 GPL-3"	NA
## caracas	"GPL"	NA
## curl	"MIT + file LICENSE"	NA
## doParallel	"GPL-2"	NA
## dplyr	"MIT + file LICENSE"	NA
## foreach	"Apache License (== 2.0)"	NA
## freetypeharfbuzz	"GPL-3 file LICENSE"	NA
## generics	"MIT + file LICENSE"	NA
## httr	"MIT + file LICENSE"	NA
## iterators	"Apache License (== 2.0)"	NA
## microbenchmark	"BSD_2_clause + file LICENSE"	NA
## minpack.lm	"GPL-3"	NA
## nlmrt	"GPL-2"	NA
## nlsalt	"GPL-2"	NA
## nlspkg	"GPL-2, GPL-3"	NA
## nlsr	"GPL-2"	NA
## numDeriv	"GPL-2"	NA
## openssl	"MIT + file LICENSE"	NA
## png	"GPL-2 GPL-3"	NA
## pryr	"GPL-2"	NA
## purrr	"GPL-3 file LICENSE"	NA
## rappdirs	"MIT + file LICENSE"	NA
## reticulate	"Apache License 2.0"	NA
## sys	"MIT + file LICENSE"	NA
## tidyselect	"MIT + file LICENSE"	NA
## base64enc	"GPL-2 GPL-3"	NA
## brio	"MIT + file LICENSE"	NA
## cairoDevice	"GPL"	NA
## callr	"MIT + file LICENSE"	NA
## cli	"MIT + file LICENSE"	NA
## cpp11	"MIT + file LICENSE"	NA
## crayon	"MIT + file LICENSE"	NA
## data.table	"MPL-2.0 file LICENSE"	NA
## desc	"MIT + file LICENSE"	NA
## diffobj	"GPL (>= 2)"	NA
## digest	"GPL (>= 2)"	NA
## ellipsis	"MIT + file LICENSE"	NA
## evaluate	"MIT + file LICENSE"	NA
## fansi	"GPL (>= 2)"	NA
## flextable	"GPL-3"	NA
## fontBitstreamVera	"file LICENCE"	"yes"
## fontLiberation	"file LICENSE"	"yes"
## fontquiver	"GPL-3 file LICENSE"	NA
## freetypeharfbuzz	"GPL-3 file LICENSE"	NA
## gdtools	"GPL-3 file LICENSE"	NA
## glue	"MIT + file LICENSE"	NA
## highr	"GPL"	NA

## htmltools	"GPL (>= 2)"	NA
## htmlwidgets	"MIT + file LICENSE"	NA
## jsonlite	"MIT + file LICENSE"	NA
## knitr	"GPL"	NA
## lifecycle	"MIT + file LICENSE"	NA
## magrittr	"MIT + file LICENSE"	NA
## markdown	"GPL-2"	NA
## mime	"GPL"	NA
## officer	"GPL-3"	NA
## pillar	"MIT + file LICENSE"	NA
## pkgconfig	"MIT + file LICENSE"	NA
## pkgload	"GPL-3"	NA
## praise	"MIT + file LICENSE"	NA
## processx	"MIT + file LICENSE"	NA
## ps	"MIT + file LICENSE"	NA
## R6	"MIT + file LICENSE"	NA
## Rcpp	"GPL (>= 2)"	NA
## rematch2	"MIT + file LICENSE"	NA
## rJava	"LGPL-2.1"	NA
## rjson	"GPL-2"	NA
## rJython	"GPL (>= 2)"	NA
## rlang	"MIT + file LICENSE"	NA
## rmarkdown	"GPL-3"	NA
## rprojroot	"MIT + file LICENSE"	NA
## rstudioapi	"MIT + file LICENSE"	NA
## rSymPy	"GPL"	NA
## stringi	"file LICENSE"	"yes"
## stringr	"GPL-2 file LICENSE"	NA
## systemfonts	"MIT + file LICENSE"	NA
## testthat	"MIT + file LICENSE"	NA
## tibble	"MIT + file LICENSE"	NA
## tinytex	"MIT + file LICENSE"	NA
## utf8	"Apache License (== 2.0) file LICENSE"	NA
## uuid	"MIT + file LICENSE"	NA
## vctrs	"MIT + file LICENSE"	NA
## waldo	"MIT + file LICENSE"	NA
## withr	"MIT + file LICENSE"	NA
## xfun	"MIT + file LICENSE"	NA
## xml2	"GPL (>= 2)"	NA
## yaml	"BSD_3_clause + file LICENSE"	NA
## zip	"MIT + file LICENSE"	NA
## base	"Part of R 4.1.0"	NA
## boot	"Unlimited"	NA
## class	"GPL-2 GPL-3"	NA
## cluster	"GPL (>= 2)"	NA
## codetools	"GPL"	NA
## compiler	"Part of R 4.1.0"	NA
## datasets	"Part of R 4.1.0"	NA
## foreign	"GPL (>= 2)"	NA
## graphics	"Part of R 4.1.0"	NA
## grDevices	"Part of R 4.1.0"	NA
## grid	"Part of R 4.1.0"	NA
## KernSmooth	"Unlimited"	NA
## lattice	"GPL (>= 2)"	NA

## MASS	"GPL-2 GPL-3"	NA
## Matrix	"GPL (>= 2) file LICENCE"	NA
## methods	"Part of R 4.1.0"	NA
## mgcv	"GPL (>= 2)"	NA
## nlme	"GPL (>= 2) file LICENCE"	NA
## nnet	"GPL-2 GPL-3"	NA
## parallel	"Part of R 4.1.0"	NA
## rpart	"GPL-2 GPL-3"	NA
## spatial	"GPL-2 GPL-3"	NA
## splines	"Part of R 4.1.0"	NA
## stats	"Part of R 4.1.0"	NA
## stats4	"Part of R 4.1.0"	NA
## survival	"LGPL (>= 2)"	NA
## tcltk	"Part of R 4.1.0"	NA
## tools	"Part of R 4.1.0"	NA
## utils	"Part of R 4.1.0"	NA
##	License_restricts_use OS_type MD5sum NeedsCompilation Built	
## askpass	NA NA NA	"yes" "4.1.0"
## benchmarkme	NA NA NA	"no" "4.1.0"
## benchmarkmeData	NA NA NA	"no" "4.1.0"
## caracas	NA NA NA	"no" "4.1.0"
## curl	NA NA NA	"yes" "4.1.0"
## doParallel	NA NA NA	"no" "4.1.0"
## dplyr	NA NA NA	"yes" "4.1.0"
## foreach	NA NA NA	"no" "4.1.0"
## freetypeharfbuzz	NA NA NA	"yes" "4.1.0"
## generics	NA NA NA	"no" "4.1.0"
## httr	NA NA NA	"no" "4.1.0"
## iterators	NA NA NA	"no" "4.1.0"
## microbenchmark	NA NA NA	"yes" "4.1.0"
## minpack.lm	NA NA NA	"yes" "4.1.0"
## nlmrt	NA NA NA	"no" "4.1.0"
## nlsalt	NA NA NA	NA "4.1.0"
## nlspkg	NA NA NA	NA "4.1.0"
## nlsr	NA NA NA	"no" "4.1.0"
## numDeriv	NA NA NA	"no" "4.1.0"
## openssl	NA NA NA	"yes" "4.1.0"
## png	NA NA NA	"yes" "4.1.0"
## pryr	NA NA NA	"yes" "4.1.0"
## purrr	NA NA NA	"yes" "4.1.0"
## rappdirs	NA NA NA	"yes" "4.1.0"
## reticulate	NA NA NA	"yes" "4.1.0"
## sys	NA NA NA	"yes" "4.1.0"
## tidyselect	NA NA NA	"yes" "4.1.0"
## base64enc	NA NA NA	"yes" "4.0.0"
## brio	NA NA NA	"yes" "4.0.5"
## cairoDevice	NA NA NA	"yes" "4.0.2"
## callr	NA NA NA	"no" "4.0.5"
## cli	NA NA NA	"no" "4.0.5"
## cpp11	NA NA NA	"no" "4.0.4"
## crayon	NA NA NA	"no" "4.0.3"
## data.table	NA NA NA	"yes" "4.0.4"
## desc	NA NA NA	"no" "4.0.4"
## diffobj	NA NA NA	"yes" "4.0.4"

## digest	NA	NA	NA	"yes"	"4.0.3"
## ellipsis	NA	NA	NA	"yes"	"4.0.5"
## evaluate	NA	NA	NA	"no"	"4.0.0"
## fansi	NA	NA	NA	"yes"	"4.1.0"
## flextable	NA	NA	NA	"no"	"4.0.5"
## fontBitstreamVera	NA	NA	NA	"no"	"4.0.0"
## fontLiberation	NA	NA	NA	"no"	"4.0.0"
## fontquiver	NA	NA	NA	"no"	"4.0.0"
## freetypeharfbuzz	NA	NA	NA	"yes"	"4.0.0"
## gdtools	NA	NA	NA	"yes"	"4.0.3"
## glue	NA	NA	NA	"yes"	"4.0.2"
## highr	NA	NA	NA	"no"	"4.0.5"
## htmltools	NA	NA	NA	"yes"	"4.0.3"
## htmlwidgets	NA	NA	NA	"no"	"4.0.3"
## jsonlite	NA	NA	NA	"yes"	"4.0.3"
## knitr	NA	NA	NA	"no"	"4.0.5"
## lifecycle	NA	NA	NA	"no"	"4.0.4"
## magrittr	NA	NA	NA	"yes"	"4.0.3"
## markdown	NA	NA	NA	"yes"	"4.0.0"
## mime	NA	NA	NA	"yes"	"4.0.3"
## officer	NA	NA	NA	"no"	"4.0.5"
## pillar	NA	NA	NA	"no"	"4.0.5"
## pkgconfig	NA	NA	NA	"no"	"4.0.0"
## pkgload	NA	NA	NA	"yes"	"4.0.5"
## praise	NA	NA	NA	"no"	"4.0.0"
## processx	NA	NA	NA	"yes"	"4.0.5"
## ps	NA	NA	NA	"yes"	"4.0.4"
## R6	NA	NA	NA	"no"	"4.0.3"
## Rcpp	NA	NA	NA	"yes"	"4.0.5"
## rematch2	NA	NA	NA	"no"	"4.0.0"
## rJava	NA	NA	NA	"yes"	"4.0.5"
## rjson	NA	NA	NA	"yes"	"4.0.0"
## rJython	NA	NA	NA	NA	"4.0.0"
## rlang	NA	NA	NA	"yes"	"4.0.5"
## rmarkdown	NA	NA	NA	"no"	"4.0.5"
## rprojroot	NA	NA	NA	"no"	"4.0.3"
## rstudioapi	NA	NA	NA	"no"	"4.0.3"
## rSymPy	NA	NA	NA	"no"	"4.0.0"
## stringi	NA	NA	NA	"yes"	"4.0.5"
## stringr	NA	NA	NA	"no"	"4.0.0"
## systemfonts	NA	NA	NA	"yes"	"4.0.5"
## testthat	NA	NA	NA	"yes"	"4.0.4"
## tibble	NA	NA	NA	"yes"	"4.0.5"
## tinytex	NA	NA	NA	"no"	"4.1.0"
## utf8	NA	NA	NA	"yes"	"4.0.4"
## uuid	NA	NA	NA	"yes"	"4.0.0"
## vctrs	NA	NA	NA	"yes"	"4.0.5"
## waldo	NA	NA	NA	"no"	"4.0.4"
## withr	NA	NA	NA	"no"	"4.0.5"
## xfun	NA	NA	NA	"yes"	"4.0.5"
## xml2	NA	NA	NA	"yes"	"4.0.0"
## yaml	NA	NA	NA	"yes"	"4.0.0"
## zip	NA	NA	NA	"yes"	"4.1.0"
## base	NA	NA	NA	NA	"4.1.0"

## boot	NA	NA	NA	"no"	"4.0.5"
## class	NA	NA	NA	"yes"	"4.0.5"
## cluster	NA	NA	NA	"yes"	"4.0.5"
## codetools	NA	NA	NA	"no"	"4.0.3"
## compiler	NA	NA	NA	NA	"4.1.0"
## datasets	NA	NA	NA	NA	"4.1.0"
## foreign	NA	NA	NA	"yes"	"4.0.3"
## graphics	NA	NA	NA	"yes"	"4.1.0"
## grDevices	NA	NA	NA	"yes"	"4.1.0"
## grid	NA	NA	NA	"yes"	"4.1.0"
## KernSmooth	NA	NA	NA	"yes"	"4.0.5"
## lattice	NA	NA	NA	"yes"	"4.1.0"
## MASS	NA	NA	NA	"yes"	"4.0.5"
## Matrix	NA	NA	NA	"yes"	"4.1.0"
## methods	NA	NA	NA	"yes"	"4.1.0"
## mgcv	NA	NA	NA	"yes"	"4.1.0"
## nlme	NA	NA	NA	"yes"	"4.0.3"
## nnet	NA	NA	NA	"yes"	"4.0.5"
## parallel	NA	NA	NA	"yes"	"4.1.0"
## rpart	NA	NA	NA	"yes"	"4.0.0"
## spatial	NA	NA	NA	"yes"	"4.0.5"
## splines	NA	NA	NA	"yes"	"4.1.0"
## stats	NA	NA	NA	"yes"	"4.1.0"
## stats4	NA	NA	NA	NA	"4.1.0"
## survival	NA	NA	NA	"yes"	"4.0.5"
## tcltk	NA	NA	NA	"yes"	"4.1.0"
## tools	NA	NA	NA	"yes"	"4.1.0"
## utils	NA	NA	NA	"yes"	"4.1.0"
##					
## \$machine					
## \$machine\$double.eps					
## [1] 2.220446e-16					
##					
## \$machine\$double.neg.eps					
## [1] 1.110223e-16					
##					
## \$machine\$double.xmin					
## [1] 2.225074e-308					
##					
## \$machine\$double.xmax					
## [1] 1.797693e+308					
##					
## \$machine\$double.base					
## [1] 2					
##					
## \$machine\$double.digits					
## [1] 53					
##					
## \$machine\$double.rounding					
## [1] 5					
##					
## \$machine\$double.guard					
## [1] 0					
##					

```

## $machine$double.ulp.digits
## [1] -52
##
## $machine$double.neg.ulp.digits
## [1] -53
##
## $machine$double.exponent
## [1] 11
##
## $machine$double.min.exp
## [1] -1022
##
## $machine$double.max.exp
## [1] 1024
##
## $machine$integer.max
## [1] 2147483647
##
## $machine$sizeof.long
## [1] 8
##
## $machine$sizeof.longlong
## [1] 8
##
## $machine$sizeof.longdouble
## [1] 16
##
## $machine$sizeof.pointer
## [1] 8
##
## $machine$longdouble.eps
## [1] 1.084202e-19
##
## $machine$longdouble.neg.eps
## [1] 5.421011e-20
##
## $machine$longdouble.digits
## [1] 64
##
## $machine$longdouble.rounding
## [1] 5
##
## $machine$longdouble.guard
## [1] 0
##
## $machine$longdouble.ulp.digits
## [1] -63
##
## $machine$longdouble.neg.ulp.digits
## [1] -64
##
## $machine$longdouble.exponent
## [1] 15
##

```

```
## $machine$longdouble.min.exp
## [1] -16382
##
## $machine$longdouble.max.exp
## [1] 16384
##
##
## $package_version
## [1] "1.0.7"
##
## $id
## [1] "2021-06-09-71715393"
##
## $date
## [1] "2021-06-09"
```

calceps.R

This is a port of Mike Malcolm's ENVIRON to R. ??ref. It computes the machine precision, radix and number of radix digits.

?? get file into chunk

calceps.R

- calceps.R example

```
### Sys.info()
```

```
```r
Sys.info()

sysname
"Linux"
release
"5.4.0-74-generic"
version
"#83-Ubuntu SMP Sat May 8 02:35:39 UTC 2021"
nodename
"M21"
machine
"x86_64"
login
"unknown"
user
"john"
effective_user
"john"
```

## Issues relating to RNG

### Issues relating to compilation of R

- LAPACK



- BLAS
- others?

## Tools for accessing and clearing environments and dataframes

?? should this be here – probably to list things in the workspace

```
sys.frame()
sys.frames()
sys.status()
sys.on.exit()
sys.parents()
sys.calls()
```

??JN exp(sin(cos())) benchmark