

# R Session Info & Packages

2023-12-23

## R packages and dependencies

We executed the project on the standard option of the **R posit cloud** with the following resource allocation

- Memory allocated: 32GB
- CPU allocated : 8 CPU

R version 4.3.2 (2023-10-31)

Platform: x86\_64-pc-linux-gnu (64-bit)

Running under: Ubuntu 20.04.6 LTS

Locale:

LC_CTYPE=C.UTF-8	LC_NUMERIC=C	LC_TIME=C.UTF-8
LC_COLLATE=C.UTF-8	LC_MONETARY=C.UTF-8	LC_MESSAGES=C.UTF-8
LC_PAPER=C.UTF-8	LC_NAME=C	LC_ADDRESS=C
LC_TELEPHONE=C	LC_MEASUREMENT=C.UTF-8	LC_IDENTIFICATION=C

time zone: UTC

tzcode source: system (glibc)

Package version:

agricolae_1.3-5	AlgDesign_1.2.1	ash_1.0-15
askpass_1.1	backports_1.4.1	base64enc_0.1-3
BH_1.81.0.1	binom_1.1-1.1	bit_4.0.5
bit64_4.0.5	boot_1.3-28.1	BSDA_1.2.1
bslib_0.4.2	cachem_1.0.7	callr_3.7.3
checkmate_2.2.0	class_7.3-22	classInt_0.4.9
cli_3.6.1	clipr_0.8.0	cluster_2.1.4
codetools_0.2-19	coin_1.4-2	colorspace_2.1-0
combinat_0.0-8	commonmark_1.9.0	compiler_4.3.2
cpp11_0.4.3	crayon_1.5.2	cubature_2.0.4.6
curl_5.0.0	data.table_1.14.8	desc_1.4.2
digest_0.6.31	dplyr_1.1.2	e1071_1.7-13
ellipsis_0.3.2	EnvStats_2.7.0	evaluate_0.20
fANCOVA_0.6-1	fansi_1.0.4	farver_2.1.1
fastmap_1.1.1	fitdistrplus_1.1-11	fontawesome_0.5.1
forcats_1.0.0	foreign_0.8-85	Formula_1.2-5
fs_1.6.2	furrr_0.3.1	future_1.32.0
generics_0.1.3	ggeasy_0.1.4	ggplot2_3.4.2
globals_0.16.2	glue_1.6.2	gmp_0.7-1
goft_1.3.6	graphics_4.3.2	grDevices_4.3.2
grid_4.3.2	gridExtra_2.3	gtable_0.3.3
gtools_3.9.4	haven_2.5.2	here_1.0.1
highr_0.10	Hmisc_5.0-1	hms_1.1.3

htmlTable_2.4.1	htmltools_0.5.5	htmlwidgets_1.6.2
httpuv_1.6.9	httr_1.4.5	inline_0.3.19
isoband_0.2.7	jquerylib_0.1.4	jsonlite_1.8.4
kableExtra_1.3.4	KernSmooth_2.23.22	klaR_1.7-2
km.ci_0.5-6	knitr_1.42	labeling_0.4.2
labelled_2.11.0	later_1.3.0	lattice_0.21-9
libcoin_1.0-9	lifecycle_1.0.3	listenv_0.9.0
loo_2.6.0	magrittr_2.0.3	markdown_1.6
MASS_7.3-60	mathjaxr_1.6-0	Matrix_1.6-1.1
MatrixModels_0.5-1	matrixStats_0.63.0	memoise_2.0.1
metadat_1.2-0	metafor_4.0-0	methods_4.3.2
mgcv_1.9.0	mime_0.12	miniUI_0.1.1.1
mnormt_2.1.1	modeltools_0.2-23	multcomp_1.4-23
munsell_0.5.0	mvtnorm_1.1-3	nlme_3.1-163
nnet_7.3-19	nortest_1.0-4	np_0.60-17
NSM3_1.17	numDeriv_2016.8-1.1	openssl_2.0.6
pacman_0.5.1	parallel_4.3.2	parallelly_1.35.0
partitions_1.10-7	pbapply_1.7.0	pillar_1.9.0
pkgbuild_1.4.0	pkgconfig_2.0.3	polynom_1.4-1
pracma_2.4.2	prettyunits_1.1.1	processx_3.8.1
progress_1.2.2	progressr_0.13.0	promises_1.2.0.1
proxy_0.4-27	ps_1.7.5	purrr_1.0.1
quadprog_1.5-8	quantreg_5.95	questionr_0.7.8
R.cache_0.16.0	R.methodsS3_1.8.2	R.oo_1.25.0
R.utils_2.12.2	R6_2.5.1	rappdirs_0.3.3
rbibutils_2.2.13	RColorBrewer_1.1.3	Rcpp_1.0.10
RcppEigen_0.3.3.9.3	RcppParallel_5.1.7	Rdpack_2.4
readr_2.1.4	remotes_2.4.2	renv_1.0.3
Rfit_0.24.2	rlang_1.1.0	rmarkdown_2.21
rpart_4.1.21	rprojroot_2.0.3	rstan_2.21.8
rstudioapi_0.14	rticles_0.24	rvest_1.0.3
sandwich_3.0-2	sass_0.4.5	scales_1.2.1
selectr_0.4.2	SemiPar_1.0-4.2	sets_1.0.24
shiny_1.7.4	sn_2.1.1	sourcetools_0.1.7.1
SparseM_1.81	splines_4.3.2	StanHeaders_2.21.0-7
stats_4.3.2	stats4_4.3.2	stringi_1.7.12
stringr_1.5.0	styler_1.10.2	SuppDists_1.1-9.7
survival_3.5-7	svglite_2.1.1	sys_3.4.1
systemfonts_1.0.4	TH.data_1.1-2	this.path_1.4.0
tibble_3.2.1	tidyr_1.3.0	tidyselect_1.2.0
tinytex_0.45	tools_4.3.2	tzdb_0.3.0
utf8_1.2.3	utils_4.3.2	vctrs_0.6.2
viridis_0.6.2	viridisLite_0.4.1	vroom_1.6.1
waveslim_1.8.4	webshot_0.5.4	withr_2.5.0
xfun_0.39	xml2_1.3.4	xtable_1.8-4
yaml_2.3.7	zoo_1.8-12	

## How we installed and setup the rstan package

We used *Rtools40* that can be found here <https://cran.r-project.org/bin/windows/Rtools/rtools40.html>

We installed *rstan* from here <https://github.com/stan-dev/rstan/wiki/RStan-Getting-Started>

## How to run the codes

We have created an R-project file and encapsulated project packages in a project library using the `renv` package.

The folders *demoPlots* and those in *misc* (*app\_misc\_results* and *sim\_misc\_results*) are empty before running any code. However, once we execute the codes in the order indicated below, they store plots and intermediate results to demonstrate the research results.

### 2–run\_codes folder

Run

1. *01-RunSimulations.R*
2. *02-SimulationStudy.R*
3. *03-StudyApplicationData-ProstateCancerDt.R*

Then, run

**3–ReproduceStudyResults.RMD** to see the project figures and tabulated results.

Please note that we added more features to the tables (highlighting interesting results) in our final report, but the numbers remain the same, though the order is different.