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Ryacas: A computer algebra system in R

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Software

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Summary

Ryacas is an R (R Core Team, 2018) package that enables a computer algebra system (CAS) within R via the open source CAS *yacas* (A. Z. Pinkus & Winitzki, 2002; A. Pinkus, Winnitzky, & Mazur, 2016), which is short for “yet another computer algebra system”.

Ryacas includes both a high-level (symbol) interface using R objects like matrices and vectors as well as direct access to the underlying *yacas* such that the user can use the full *yacas* system, including for example defining new summation rules.

From a statistician’s perspective, Ryacas does provide convenient tools directly in R like

- sums,
- limits,
- differentiation,
- integration,
- symbolic matrices and vectors,
- simplification, and
- outputting in TeX format,

which are helpful in both research and teaching. With Ryacas, these tools are conveniently available from within R through Ryacas. However, it must be stressed that *yacas* is nowhere as powerful as the larger commercial CASs.

yacas is easy to use and extensible so that the user can define new rules, for example for simplification or summations. More information about *yacas* is available at <http://www.yacas.org/>.

Ryacas contains a number of vignettes that describe both how to use the high-level interface directly with R objects and how to use the underlying *yacas* system.

Ryacas contains a version of *yacas* which is bundled into Ryacas using Rcpp (Eddelbuettel & Balamuta, 2017). This means that Ryacas can be installed like any other R package with no special installation steps being required.

References

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