

Package ‘Rcppautodiff’

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Type Package

Title An Interface to the C++ Automatic Differentiation Library
'autodiff'

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URL <https://github.com/sn248/Rcppautodiff>,
<https://sn248.github.io/Rcppautodiff/>

BugReports <https://github.com/sn248/Rcppautodiff/issues>

Description Provides an interface from R to the 'autodiff' library
<<https://autodiff.github.io/>>, a modern header-only
C++ library for automatic differentiation. Unlike numerical
differentiation, automatic differentiation computes derivatives of
functions to machine precision without truncation error, using either
forward or reverse mode. The 'autodiff' header files are shipped with
this package so that other R packages can use them by including
'Rcppautodiff' in the 'LinkingTo' field of their 'DESCRIPTION' file.
Example programs demonstrate computing derivatives of single-variable
and multi-variable functions, gradient vectors, Jacobian matrices and
derivatives with respect to parameters, using 'Rcpp' and 'RcppEigen'.

License GPL (>= 2)

Suggests knitr, rmarkdown, tinytest

Encoding UTF-8

Imports Rcpp (>= 1.0.8.3), RcppEigen

LinkingTo Rcpp, RcppEigen

VignetteBuilder knitr

Config/roxygen2/version 8.0.0

NeedsCompilation yes

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Description

Example function to show differentiation w.r.t. a single variable

Usage

autodiff_single_var(input)

Arguments

input Value of independent variable (must be greater than 0)

Value

A named list with two elements, value (the function $f(x) = 1 + x + x^2 + 1/x + \log(x)$ evaluated at input) and derivative (the derivative of f evaluated at input).

Examples

```
res <- autodiff_single_var(2.0)
res$value      # f(2)  = 1 + 2 + 4 + 0.5 + log(2)
res$derivative # f'(2) = 1 + 4 - 0.25 + 0.5 = 5.25
```

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