

Package ‘PROJ’

December 1, 2023

Title Generic Coordinate System Transformations Using 'PROJ'

Version 0.4.5

Description A wrapper around the generic coordinate transformation software 'PROJ' that transforms coordinates from one coordinate reference system ('CRS') to another. This includes cartographic projections as well as geodetic transformations. The intention is for this package to be used by user-packages such as 'reproj', and that the older 'PROJ.4' and version 5 pathways be provided by the 'proj4' package.

Depends R (>= 3.0.2)

License GPL-3

Encoding UTF-8

LazyData true

Suggests testthat (>= 2.1.0), spelling, knitr, rmarkdown

URL <https://github.com/hypertidy/PROJ>

BugReports <https://github.com/hypertidy/PROJ/issues>

Language en-US

VignetteBuilder knitr

SystemRequirements PROJ (>= 6.3.1)

RoxygenNote 7.2.3

NeedsCompilation yes

Author Michael D. Sumner [aut, cre] (<<https://orcid.org/0000-0002-2471-7511>>),
Jeroen Ooms [ctb] (provided PROJ library support on Windows, and
assistance with Windows configuration),
Simon Urbanek [cph, ctb] (wrote original code versions for PROJ version
6),
Dewey Dunnington [ctb] (key code contributions)

Maintainer Michael D. Sumner <mdsumner@gmail.com>

Repository CRAN

Date/Publication 2023-12-01 22:10:08 UTC

R topics documented:

ok_proj6	2
proj_crs_text	3
proj_trans	4
proj_version	5
xymap	5
Index	6

ok_proj6	<i>Is 'PROJ' library >= 6' available</i>
----------	---

Description

Test for availability of 'PROJ' system library version 6 or higher.

Usage

```
ok_proj6()
```

Details

On unix-alikes, this function is run in `.onLoad()` to check that version 6 functionality is available. On Windows, the load process sets the data file location with the version 6 API, and that is used as a test instead.

If 'PROJ' library version 6 is not available, the package still compiles and installs but is not functional.

The lack of function can be simulated by setting `options(reproj.mock.noproj6 = TRUE)`, designed for use with the reproj package.

Value

logical, TRUE if the system library 'PROJ >= 6'

Examples

```
ok_proj6()
```

proj_crs_text	<i>Generate a projection string.</i>
---------------	--------------------------------------

Description

Input any accepted format of 'PROJ' coordinate reference system specification. Return value is a string in the requested format.

Usage

```
proj_crs_text(source, format = 0L)
```

Arguments

source	input projection specification one of ('PROJ4', 'WKT2', 'EPSG', 'PROJJSON', ... see the library documentation link in Details)
format	integer, 0 for 'WKT', 1 for 'PROJ', 2 for 'PROJJSON'

Details

This function requires PROJ version 6.0 or higher to be useful. If not, this function simply returns 'NA'.

See the [library documentation](#) for details on input and output formats.

Value

character string in requested format

warning Note that a PROJ string is not a full specification, in particular this means that a string like "+proj=laea" cannot be converted to full WKT, because it is technically a transformation step not a crs. To get the full WKT form use a string like "+proj=laea +type=crs".

Examples

```
if (ok_proj6()) {  
  cat(proj_crs_text("OGC:CRS84", format = 0L))  
  proj_crs_text("OGC:CRS84", format = 1L)  
  south55 <- "+proj=utm +zone=55 +south +ellps=GRS80 +units=m +no_defs +type=crs"  
  proj_crs_text(proj_crs_text(south55), 1L)  
}
```

proj_trans

*Transform a set of coordinates with 'PROJ'***Description**

A raw interface to 'proj_trans' in 'PROJ => 6', if it is available.

Usage

```
proj_trans(x, target, ..., source = NULL, z_ = NULL, t_ = NULL)
```

Arguments

x	input coordinates (x,y, list or matrix see z_ and t_)
target	projection for output coordinates
...	ignored
source	projection of input coordinates (must be named i.e. 'source = "<some proj string"' can't be used in positional form)
z_	optional z coordinate vector
t_	optional t coordinate vector

Details

Input 'x' is assumed to be 2-columns of "x", then "y" coordinates. If "z" or "t" is required pass these in as named vectors with "z_" and "t_". For simplifying reasons z_ and t_ must always match the length of x y. Both default to 0, and are automatically recycled to the number of rows in x.

Values that are detected out of bounds by library PROJ are allowed, we return Inf in this case, rather than the error "tolerance condition error".

Value

list of transformed coordinates, with 4- or 2-elements x_, y_, z_, t_

References

see the [PROJ library documentation](#) for details on the underlying functionality

Examples

```
if (ok_proj6()) {
  proj_trans(cbind(147, -42), "+proj=laea", source = "OGC:CRS84")
  proj_trans(cbind(147, -42), z_ = -2, "+proj=laea", source = "OGC:CRS84")
  proj_trans(cbind(147, -42), z_ = -2, t_ = 1, "+proj=laea", source = "OGC:CRS84")
}
```

proj_version	<i>Report PROJ library version</i>
--------------	------------------------------------

Description

This function returns NA if PROJ lib is not available.

Usage

```
proj_version()
```

Value

character string (major.minor.patch)

Examples

```
proj_version()
```

xymap	<i>xymap data for testing</i>
-------	-------------------------------

Description

A copy of the xymap data set from the quadmesh package.

Details

A matrix of longitude/latitude values of the world coastline.

Index

ok_proj6, [2](#)

proj_crs_text, [3](#)

proj_trans, [4](#)

proj_version, [5](#)

xymap, [5](#)