

Package ‘PROJ’

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Title Generic Coordinate System Transformations Using 'PROJ'

Version 0.3.1

Description A wrapper around the generic coordinate transformation software 'PROJ' that transforms geospatial coordinates from one coordinate reference system ('CRS') to another. This includes cartographic projections as well as geodetic transformations. Version 7.1.0-1 or higher of the R package 'libproj' is required. 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. Separating this disruptive version change (from 4.0 and 5.0, to 6.0 and above) allows the use of existing and stable code in 'proj4' alongside the new idioms and requirements of modern 'PROJ'. For control of metadata files for the 'PROJ' library, see tools in the 'libproj' 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>

RoxygenNote 7.1.1

Language en-US

VignetteBuilder knitr

LinkingTo libproj (>= 7.1.0-1)

Imports libproj (>= 7.1.0-1)

NeedsCompilation yes

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

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.

Some nuances of the format are not available, currently we use formats '0: PJ_WKT2_2018' '1: PJ_PROJ_5', '2: PROJJSON'.

Some formats are hard to read, such as WKT so for easy reading use `cat()`.

Value

character string in requested format

Examples

```
cat(proj_crs_text("EPSG:4326", format = 0L))
proj_crs_text("EPSG:4326", 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)
```

```
proj_trans_generic(x, target, ..., source = NULL, z_ = 0, t_ = 0)
```

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)
z_	optional z coordinate vector
t_	optional t coordinate vector

Details

'proj_trans_generic()' and 'proj_trans()' have the same arguments, but differ in the default values of z_ and t_, 0 or NULL. 'proj_trans_generic()' always returns a list for 4 elements, 'proj_trans()' will return 2 or 4 depending on the input.

'proj_trans_generic()' is a misnomer in that 'proj_trans' is the function from the PROJ library that is now used.

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 so it's pretty flexible.

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-elements x_, y_, z_, t_

References

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

Examples

```
proj_trans(cbind(147, -42), "+proj=laea", source = "epsg:4326")
proj_trans(cbind(147, -42), z_ = -2, "+proj=laea", source = "epsg:4326")
proj_trans(cbind(147, -42), z_ = -2, t_ = 1, "+proj=laea", source = "epsg:4326")
```

*xymap**xymap data for testing*

Description

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

Details

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

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