

NAME

cct – Coordinate Conversion and Transformation

SYNOPSIS

cct [**-c** *lostvz* [*args*]] **+opts**[=*arg*] *file*[*s*]

DESCRIPTION

cct a 4D equivalent to the **proj** projection program, performs transformation coordinate systems on a set of input points. The coordinate system transformation can include translation between projected and geographic coordinates as well as the application of datum shifts.

The following control parameters can appear in any order:

-c *<x,y,z,t>*

Specify input columns for (up to) 4 input parameters. Defaults to 1,2,3,4.

-d *<n>*

New in version 5.2.0: Specify the number of decimals in the output.

-I Do the inverse transformation.

-o *<output file name>*, **--output**=*<output file name>*

Specify the name of the output file.

-t *<time>*, **--time**=*<time>*

Specify a fixed observation *time* to be used for all input data.

-z *<height>*, **--height**=*<height>*

Specify a fixed observation *height* to be used for all input data.

-s *<n>*, **--skip-lines**=*<n>*

New in version 5.1.0.

Skip the first *n* lines of input. This applies to any kind of input, whether it comes from **STDIN**, a file or interactive user input.

-v, **--verbose**

Write non-essential, but potentially useful, information to stderr. Repeat for additional information (**-vv**, **-vvv**, etc.)

--version

Print version number.

The *+args* arguments are associated with coordinate operation parameters. Usage varies with operation.

cct is an acronym meaning *Coordinate Conversion and Transformation*.

The acronym refers to definitions given in the OGC 08–015r2/ISO–19111 standard “Geographical Information – Spatial Referencing by Coordinates”, which defines two different classes of *coordinate operations*:

Coordinate Conversions, which are coordinate operations where input and output datum are identical (e.g. conversion from geographical to cartesian coordinates) and

Coordinate Transformations, which are coordinate operations where input and output datums differ (e.g. change of reference frame).

EXAMPLES

1. The operator specs describe the action to be performed by **cct**. So the following script

```
echo 12 55 0 0 | cct +proj=utm +zone=32 +ellps=GRS80
```

will transform the input geographic coordinates into UTM zone 32 coordinates. Hence, the command

```
echo 12 55 | cct -z0 -t0 +proj=utm +zone=32 +ellps=GRS80
```

Should give results comparable to the classic **proj** command

```
echo 12 55 | proj +proj=utm +zone=32 +ellps=GRS80
```

2. Convert geographical input to UTM zone 32 on the GRS80 ellipsoid:

```
cct +proj=utm +ellps=GRS80 +zone=32
```

3. Roundtrip accuracy check for the case above:

```
cct +proj=pipeline +proj=utm +ellps=GRS80 +zone=32 +step +step +inv
```

4. As (2) but specify input columns for longitude, latitude, height and time:

```
cct -c 5,2,1,4 +proj=utm +ellps=GRS80 +zone=32
```

5. As (2) but specify fixed height and time, hence needing only 2 cols in input:

```
cct -t 0 -z 0 +proj=utm +ellps=GRS80 +zone=32
```

6. Auxiliary data following the coordinate input is forward to the output stream:

```
$ echo 12 56 100 2018.0 auxiliary data | cct +proj=merc
1335833.8895 7522963.2411 100.0000 2018.0000 auxiliary data
```

BACKGROUND

cct also refers to Carl Christian Tscherning (1942–2014), professor of Geodesy at the University of Copenhagen, mentor and advisor for a generation of Danish geodesists, colleague and collaborator for two generations of global geodesists, Secretary General for the International Association of Geodesy, IAG (1995–2007), fellow of the American Geophysical Union (1991), recipient of the IAG Levallois Medal (2007), the European Geosciences Union Vening Meinesz Medal (2008), and of numerous other honours.

cct, or Christian, as he was known to most of us, was recognized for his good mood, his sharp wit, his tireless work, and his great commitment to the development of geodesy – both through his scientific contributions, comprising more than 250 publications, and by his mentoring and teaching of the next generations of geodesists.

As Christian was an avid Fortran programmer, and a keen Unix connoisseur, he would have enjoyed to know that his initials would be used to name a modest Unix style transformation filter, hinting at the tireless aspect of his personality, which was certainly one of the reasons he accomplished so much, and meant so much to so many people.

Hence, in honour of *cct* (the geodesist) this is **cct** (the program).

SEE ALSO

proj(1), **cs2cs(1)**, **geod(1)**, **gie(1)**

BUGS

A list of know bugs can be found at <https://github.com/OSGeo/proj.4/issues> where new bug reports can be submitted to.

HOME PAGE

<https://proj4.org/>

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