Red Hat Enterprise Linux Release 9.2 Manual Pages on 'cct.1' command

$ man cct.1

CCT(1)   PROJ   CCT(1)

NAME

    cct - Coordinate Conversion and Transformation

SYNOPSIS

    cct [-clostvz [args]] +opt[=arg] ... file ...

    or

    cct [-clostvz [args]] {object_definition} file ...

    Where {object_definition} is one of the possibilities accepted by

    proj_create(), provided it expresses a coordinate operation

     ? a proj-string,

     ? a WKT string,

     ? an object code (like "EPSG:1671" "urn:ogc:def:coordinateOpera?

      tion:EPSG::1671"),

     ? an object name. e.g. "ITRF2014 to ETRF2014 (1)". In that case as

      uniqueness is not guaranteed, heuristics are applied to determine

      the appropriate best match.

     ? a OGC URN combining references for concatenated operations (e.g.

      "?

      urn:ogc:def:coordinateOperation,coordinateOperation:EPSG::3895,co?

      ordinateOperation:EPSG::1618")

     ? a   PROJJSON   string.   The   jsonschema   is   at

      https://proj.org/schemas/v0.4/projjson.schema.json

    New in version 8.0.0.

NOTE:

> Before version 8.0.0 only proj-strings could be used to instan‐
> tiate operations in cct.

or

> cct [-clostvz [args]] {object_reference} file ...

where {object_reference} is a filename preceded by the '@' character.

The file referenced by the {object_reference} must contain a valid {ob‐

ject_definition}.

> New in version 8.0.0.

DESCRIPTION

> cct is a 4D equivalent to the proj projection program, performs trans‐
> formation coordinate systems on a set of input points. The coordinate
> system transformation can include translation between projected and ge‐
> ographic 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 in‐
>> put, whether it comes from STDIN, a file or interactive user in‐
>> put.

-v, --verbose

    Write non-essential, but potentially useful, information to

    stderr. Repeat for additional information (-vv, -vvv, etc.)

--version

    Print version number.

The +opt 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 Coordi?

nates", 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 carte?

sian coordinates) and

Coordinate Transformations, which are coordinate operations where input

and output datums differ (e.g. change of reference frame).

USE OF REMOTE GRIDS

New in version 7.0.0.

If the PROJ_NETWORK environment variable is set to ON, cct will attempt

to use remote grids stored on CDN (Content Delivery Network) storage,

when they are not available locally.

More details are available in the network section.

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 coor?

dinates. 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 out?

put stream:

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

7. Coordinate operation referenced through its code

```
$ echo 3541657.3778 948984.2343 5201383.5231 2020.5 | cct EPSG:8366
3541657.9112    948983.7503  5201383.2482    2020.5000
```

8. Coordinate operation referenced through its name

```
$ echo 3541657.3778 948984.2343 5201383.5231 2020.5 | cct "ITRF2014 to ETRF2014 (1)"
3541657.9112    948983.7503  5201383.2482    2020.5000
```

BACKGROUND

cct also refers to Carl Christian Tscherning (1942--2014), professor of

Geodesy at the University of Copenhagen, mentor and advisor for a gen?

eration of Danish geodesists, colleague and collaborator for two gener?

ations of global geodesists, Secretary General for the International

Association of Geodesy, IAG (1995--2007), fellow of the American Geo?

physical 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 commit?

ment to the development of geodesy -- both through his scientific con?

tributions, 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 connois?

seur, 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), projinfo(1), projsync(1)

BUGS

A list of known bugs can be found at https://github.com/OSGeo/PROJ/issues where new bug reports can be sub? mitted to.

HOME PAGE

https://proj.org/

AUTHOR

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