NAME

cs2cs – Cartographic coordinate system filter

SYNOPSIS

cs2cs [**–eEfIlrstvwW** [args]] [*+opts[=arg]*] [+to [*+opts[=arg]*]] file[s]

DESCRIPTION

cs2cs performs transformation between the source and destination cartographic coordinate system 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:

–I Method to specify inverse translation, convert from *+to* coordinate system to the primary coordinate system defined.

–t<a> Where *a* specifies a character employed as the first character to denote a control line to be passed through without processing. This option applicable to ASCII input only. (# is the default value).

–d <n>

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

–e <string>
Where *string* is an arbitrary string to be output if an error is detected during data transformations. The default value is a three character string: ***\t***.

–E Causes the input coordinates to be copied to the output line prior to printing the converted values.

–l<[=id]>
List projection identifiers that can be selected with *+proj*. **cs2cs –l=id** gives expanded description of projection *id*, e.g. **cs2cs –l=merc**.

–lp List of all projection id that can be used with the *+proj* parameter. Equivalent to **cs2cs –l**.

–lP Expanded description of all projections that can be used with the *+proj* parameter.

–le List of all ellipsoids that can be selected with the *+ellps* parameters.

–lu List of all distance units that can be selected with the *+units* parameter.

–ld List of datums that can be selected with the *+datum* parameter.

–r This options reverses the order of the expected input from longitude–latitude or x–y to latitude–longitude or y–x.

–s This options reverses the order of the output from x–y or longitude–latitude to y–x or latitude–longitude.

–f <format>
Where *format* is a printf format string to control the form of the output values. For inverse projections, the output will be in degrees when this option is employed. If a format is specified for inverse projection the output data will be in decimal degrees. The default format is **"%.2f"** for forward projection and DMS for inverse.

–w<n> Where *n* is the number of significant fractional digits to employ for seconds output (when the option is not specified, **–w3** is assumed).

–W<n>
Where *n* is the number of significant fractional digits to employ for seconds output. When **–W** is employed the fields will be constant width with leading zeroes.

–v Causes a listing of cartographic control parameters tested for and used by the program to be printed prior to input data.

The *+args* run−line arguments are associated with cartographic parameters.

The **cs2cs** program requires two coordinate system definitions. The first (or primary is defined based on all projection parameters not appearing after the *+to* argument. All projection parameters appearing after the *+to* argument are considered the definition of the second coordinate system. If there is no second coordinate system defined, a geographic coordinate system based on the datum and ellipsoid of the source coordinate system is assumed. Note that the source and destination coordinate system can both be projections, both be geographic, or one of each and may have the same or different datums.

Additional projection control parameters may be contained in two auxiliary control files: the first is optionally referenced with the *+init=file:id* and the second is always processed after the name of the projection has been established from either the run−line or the contents of *+init* file. The environment parameter **PROJ_LIB** establishes the default directory for a file reference without an absolute path. This is also used for supporting files like datum shift files.

One or more files (processed in left to right order) specify the source of data to be transformed. A **−** will specify the location of processing standard input. If no files are specified, the input is assumed to be from stdin. For input data the two data values must be in the first two white space separated fields and when both input and output are ASCII all trailing portions of the input line are appended to the output line.

Input geographic data (longitude and latitude) must be in DMS or decimal degrees format and input cartesian data must be in units consistent with the ellipsoid major axis or sphere radius units. Output geographic coordinates will normally be in DMS format (use **−f %.12f** for decimal degrees with 12 decimal places), while projected (cartesian) coordinates will be in linear (meter, feet) units.

EXAMPLE

The following script

```
cs2cs +proj=latlong +datum=NAD83 +to +proj=utm +zone=10 +datum=NAD27 -r <<EOF
45d15'33.1" 111.5W
45d15.551666667N -111d30
+45.25919444444 111d30'000w
EOF
```

will transform the input NAD83 geographic coordinates into NAD27 coordinates in the UTM projection with zone 10 selected. The geographic values of this example are equivalent and meant as examples of various forms of DMS input. The x−y output data will appear as three lines of:

```
1402285.98  5076292.42 -0.00
```

SEE ALSO

proj(1), **cct(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.

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https://proj4.org/

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