NAME

ctwill, ctwill-refsort, ctwill-twinx – translate CWEB to TeX
with mini-indexes per spread or per section

SYNOPSIS

ctwill [*options*] *webfile*[.w] [{*changefile*[.ch]|-} [*outfile*[.tex]]]
ctwill-refsort < *indexfile*.ref > *indexfile*.sref
ctwill-twinx *outfile*.tex [*outfile*.tex ...] > index.tex

DESCRIPTION

The **ctwill** program converts a CWEB source document into a TeX file that may be formatted and printed in the usual way. It takes appropriate care of typographic details like page layout and the use of indentation, *italics*, **boldface**, etc., and it supplies extensive cross-index information that it gathers automatically.

CWEB allows you to prepare a single document containing all the information that is needed both to produce a compilable C/C++ program and to produce a well-formatted document describing the program in as much detail as the writer may desire. The user of CWEB ought to be familiar with TeX as well as C/C++.

USAGE

The command line should have one, two, or three names on it. The first is taken as the CWEB input file (and **.w** is added if there is no extension). If there is a second name, it is a change file (and **.ch** is added if there is no extension). The change file overrides parts of the CWEB file, as described in the documentation. If there is a third name, it overrides the default name of the output file, which is ordinarily the same as the name of the input file (but on the current directory) with the extension **.tex**. If you just want to change the output file name, but don't have a change file to apply, you can use '**-**' as the second argument.

ctwill is exactly like **cweave** except that it produces much better documentation, for which you must work harder. You should run **ctwill** twice, once to prime the pump and once to get decent answers. Moreover, you must run the output twice through TeX.

After **tex foo** you will have output that looks like final pages except that the entries of mini-indexes won't be alphabetized. The first run produces a weird file called **foo.ref**. Say **ctwill-refsort < foo.ref > foo.sref** and then another **tex foo** will produce alphabetized output.

The **ctwill-twinx** program compiles a master index for a set of related programs that have been processed by **ctwill**. The individual programs should define their names with a line of the form **\def\title{NAME}**.

The mini-indexes list identifiers that are used but not defined on each two-page spread. At the end of each section, **ctwill** gives TeX a list of identifiers used in that section and information about where they are defined.

The current meaning of every identifier is initially **\uninitialized**. Then **ctwill** reads the **.aux** file for your job, if any.

Before reading the **.aux** file, **ctwill** actually looks for a file called **system.bux**, which will be read if present. And after **foo.aux**, a third possibility is **foo.bux**. The general convention is to put definitions of system procedures such as *printf* into **system.bux**, and to put definitions found in specifically foo-ish header files into **foo.bux**. Like the **.aux** files, **.bux** files should contain only **@$** specifications.

The meaning specified by **@$...@>** generally has four components: an identifier (followed by space), a program name (enclosed in braces), a section number (followed by space), and a TeX part.

A special *proofmode* is provided so that you can check **ctwill**'s conclusions about cross-references. Run **ctwill** with the flag **+P**, and TeX will produce a specially formatted document (*without* mini-indexes) in which you can check that your specifications are correct.

More details how to use **ctwill** can be found in the first sections of its source code, respectively the change file **cweav-twill.ch** applicable to the **cweave.w** source. A complete example with all bells and whistles is described in **Mini-Indexes for Literate Programs**, pages 225–245 of Knuth's **Digital Typography**.

DIFFERENCES TO ORIGINAL CTWILL

The present incarnation of **ctwill** and its utilities tries hard to be a drop-in replacement for the original package. There are, however, a few differences worth noting:

- This version is based on the most recent version of CWEB (3.64c).
- In TeX Live the utility programs are prefixed with **ctwill-** and the macro files with **ct** for technical reasons.
- Options **--help**, **--quiet**, **--verbose**, **--version**, and flags **-i**, **-o**, and **+lX** are new in CWEBbin and TeX Live.
- Option **+lX** is accompanied by example wrapper files for **ctwimac.tex** and **ctproofmac.tex** with translated captions for German (**+ld**).
- **ctwill** in TeX Live operates silently by default; use the **--verbose** option to get the original behavior.
- File lookup with the environment variable CWEBINPUTS is extended to permit several, colon-separated, paths.
- If properly configured, the main program **ctwill** is localized with the "GNU gettext utilities".

OPTIONS

Options on the command line may be either turned off with '**-**' (if they are on by default) or turned on with '**+**' (if they are off by default). In fact, the options are processed from left to right, so a sequence like **--verbose -h** will only show the **banner line** (**+b**) and the **progress report** (**+p**), but leave out the **happy message** (**-h**).

- **+b**: print banner line on terminal
- **+h**: print success message on completion
- **+p**: print progress report messages
- **+q/-q**: shortcut for **-bhp**; also **--quiet** (default)
- **+v/-v**: shortcut for **+bhp**; also **--verbose**
- **-e**: do not enclose C/C++ material in **\PB{...}**
- **-f**: do not force a newline after every C/C++ statement in output
- **-i**: suppress indentation of parameter declarations
- **-o**: suppress separation of declarations and statements
- **-x**: omit indices, section names, table of contents

- **+P**: **\input ctproofmac.tex** instead of **ctwimac.tex**
- **+lX/-lX**: use macros for language *X* as of *X*{**ctwimac|ctproofmac**}**.tex**
- **+s**: print usage statistics
- **--help**: display help message and exit
- **--version**: output version information and exit

ENVIRONMENT

The environment variable CWEBINPUTS is used to search for the input files, or the system default if CWEBINPUTS is not set. See tex(1) for the details of the searching.

If prepared for NLS support, **ctwill** like **ctangle** and **cweave** uses the environment variable TEXMFLOCALEDIR to configure the parent directory where the "GNU gettext utilities" search for translation catalogs.

These variables are preconfigured in TeX Live's **texmf.cnf**.

FILES

The location of the files mentioned below varies from system to system. Use the **kpsewhich** utility to find their locations.

- **ctwimac.tex**: The default TeX macros **\input** in the first line of the output file.
- **ctproofmac.tex**: If **ctwill** is invoked with the **+P** option, it will change the first line of the output file to **\input ctproofmac.tex**.

In both cases you can request some prefix *X* with the **+lX** option, e.g., **+ld** will **\input dctwimac.tex** and **+Pld** will **\input dctproofmac.tex**.

- *webfile***.bux**: Reference definitions to resolve from other modules.
- **system.bux**: Reference definitions to resolve from C/C++ standard library header files like **<stdio.h>**.

Other **aux**iliary files with references are created automatically by **ctwill** and the actual index files are created by TeX.

- **cwebman.tex**: The CWEB user manual, available in PDF from CTAN (https://ctan.org/pkg/cweb).

SEE ALSO

- The CWEB System of Structured Documentation: by Donald E. Knuth and Silvio Levy (hardcopy version of **cwebman.tex** and the source code listings of **common.w**, **ctangle.w**, and **cweave.w**).
- Digital Typography: by D. E. Knuth.
- Literate Programming: by D. E. Knuth.
- Weaving a Program: by Wayne Sewell.

cweb(1), tex(1), cc(1)

AUTHORS

Don Knuth wrote **ctwill** based on **cweave** by Silvio Levy and Knuth.
ctwill and its utilities **ctwill-refsort** and **ctwill-twinx** have been fully integrated with the CWEBbin extension that serves as the basis for CWEB in TeX Live; see the project page (https://github.com/ascherer/cwebbin).