

# The `texassert` package\*

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## Abstract

An assertion library for unit testing in plain TeX.

## 1 Introduction

This package emerged from a desire to explore `l3build` and literate programming. It provides a collection of Plain TeX macros that I originally used for unit testing, now converted into a `.dtx` file, allowing for regeneration of the original source files from the literate code.

All `.tex` files in this package are written in Plain TeX, offering a simple mechanism for performing assertions in unit testing Plain TeX macros. I hope you find it useful. *Profitez!*

## 2 Usage Examples

### 2.1 Length Assertions

To unit test the `\lengthof` macro in this library, for example, we can create a file `length-tests.tex` with something like:

```
% Import the necessary macros
\input import \import{lengthof} \import{assert}

% Length of an empty string is zero
\lengthof{} \asserteq\the\length=0

% Length of '0' is one
\lengthof{0} \asserteq\the\length=1

% Length of '12.3456' is seven
\lengthof{12.3456} \asserteq\the\length=7

% Summary of the assertions made so far
\assertionsummary

\bye
```

Compile it with a TeX engine, e.g. `pdftex length-tests.tex`, we get an output file `length-tests.pdf` with something like:

Assertion Summary: 3/3 assertions passed i.e. 0/3 assertions failed.

---

\*This document corresponds to `texassert` v0.0.2, dated 2024/11/07.

## 2.2 (More Examples ...)

TODO

## 3 Source Repository

<https://github.com/hansonchar/texassert>

## 4 Useful Resources

Not so much related to the library provided by this package per se, but some commands and external resources which I found directly useful or necessary for the purpose of *constructing* this package per se.

1. [Examples](#) in the `l3build` repository. The `simple-tree` example in particular.
2. `texdoc l3build` – information directly related to `l3build`.
3. `texdoc doc` – the `doc` package used by `l3build` implicitly.
4. `texdoc docstrip` – the `docstrip` package used by `l3build` implicitly.
5. `texdoc source2e` – information related to various macros that are or can be used in a `.dtx` file.
6. `texdoc dtxtut` – Scott Pakin. *How to Package Your L<sup>A</sup>T<sub>E</sub>X Package*. January 21, 2024. (I had lots of *Aha!* moments in reading this.)
7. Michel Gossens, Frank Mittelbach, and Alexander Samarin. *The L<sup>A</sup>T<sub>E</sub>X Companion*. Addison Wesley, Reading, Massachusetts, October 1, 1994. ISBN 0-201-54199-8.

## 5 Implementation

`import.tex` Contains `\import`.

`\import` Used to prevent the same file from being `\input` more than once.

```
1 \def\import#1{%
2   \expandafter\ifx\csname import:#1\endcsname\relax
3     \input #1
4     \expandafter\gdef\csname import:#1\endcsname{}%
5     % Imported #1\par
6   \fi
7 }
```

`common.tex` Contains common code and configuration used in this library.

```
8 \showboxdepth=\maxdimen \showboxbreadth=\maxdimen
9
10 \newtoks\result \newtoks\tokstemp
11 \newcount\n
12 \newcount\integer
```

```

13
14 \def\true{\let\bool=\iftrue}
15 \def\false{\let\bool=\iffalse}

```

`\debug` Writes a line of debug message immediately to the terminal and the log file when debugging is enabled (via `\debugtrue` which is the default).

```

16 \newif\ifdebug
17 \debugtrue
18 \def\debug#1{\ifdebug \immediate\write16{[DEBUG] #1}\fi}

```

`\ifEmpty` Checks if the given parameter is empty.

```

19 \newif\ifempty
20 \def\checkifempty#1{\expandafter\def\expandafter\input\expandafter{#1}%
21   \global\ifx\input\empty \emptytrue\else\emptyfalse\fi}%
22
23 % Assigning \iffalse to \then and use as a parameter delimiter
24 % is critical in making the if-macros skippable.
25 % Source: https://tug.org/TUGboat/tb45-1/tb139wormuth-isint.pdf
26 \let\then=\iffalse
27 \def\ifEmpty#1\then{%
28   \checkifempty{#1}\ifempty
29 }

```

`\ifUndefined` Checks if the given control sequence is undefined.

```

30 \long\def\ifUndefined#1\then{%
31   \edef\x{\meaning#1}%
32   \let\e=\escapechar \escapechar=-1
33   \edef\y{\string\undefined}\escapechar=\e
34   \def\true{\iftrue}\def\false{\iffalse}%
35   \def\next{\expandafter\expandafter\expandafter
36     \aftergroup\ifx\x\y\true\else\false\fi}\next}}

```

`\ifDefined` Checks if the given control sequence is defined.

```

37 \long\def\not#1#2\then{#1#2\then \false \else \true \fi \bool}
38 \long\def\ifDefined#1\then{\ifUndefined#1\then
39   \false \else \true\fi \bool}

```

`lengthof.tex` Contains the code used to find out the length of a given string.

`\lengthof` Computes the length of the given string parameter.

```

40 \input import \import{common}
41
42 \newcount\length
43 \edef\temp{\the\catcode'\catcode'@=11
44
45 \def\lengthof#1{\length=0 %
46   \bgroup
47   \edef\lengthof@input{#1}%
48   \ifEmpty\lengthof@input\then
49     \let\next=\relax
50   \else
51     \def\next{\expandafter\lengthofA\lengthof@input\eof}%
52   \fi
53   \next

```

```

54 \egroup
55 }
56 \def\lengthofA#1#2\eut{\global\advance\length by1
57 \ifEmpty#2\then
58 \let\next=\relax
59 \else
60 \def\next{\lengthofA#2\eut}%
61 \fi
62 \next
63 }
64
65 \catcode'\@=\temp % restore the original catcode for @

```

`checkeq.tex` Contains the code used to check if two given strings are equal.

`\checkeq` Used to check if two given strings are equal. Assume no space in the strings.

```

66 \input import \import{lengthof}
67
68 \newif\ifeq
69 \edef\temp{\the\catcode'\@}\catcode'\@=11
70
71 \global\eqtrue
72 % Assume no spaces
73 \def\checkeq#1#2{%
74 \edef\checkeq@fstparam{#1}%
75 \edef\checkeq@sndparam{#2}%
76 \lengthof\checkeq@fstparam \edef\lena{\number\length}%
77 \lengthof\checkeq@sndparam \edef\lenb{\number\length}%
78 \ifx\lena\lenb
79 \ifnum\length=0
80 \global\eqtrue \let\next=\relax
81 \else
82 \expandafter\expandafter\expandafter
83 \def\expandafter\expandafter\expandafter
84 \next\expandafter\expandafter\expandafter
85 {\expandafter\expandafter\expandafter
86 \checkeqA\expandafter\checkeq@fstparam
87 \expandafter\eut\checkeq@sndparam\eut}%
88 \fi
89 \else
90 \global\eqfalse \let\next=\relax
91 \fi
92 \next
93 }}
94 \def\checkeqA#1#2\eut#3#4\eut{%
95 \if#1#3{% the trailing '{}' is necessary to avoid
96 \ifx\relax#2\relax % extra spaces
97 \global\eqtrue \let\next=\relax
98 \else
99 \def\next{\checkeqA#2\eut#4\eut}%
100 \fi
101 \else
102 \global\eqfalse \let\next=\relax
103 \fi

```

```

104 \next
105 }
106
107 \catcode'\@=\temp % restore the original catcode for @

```

**assert.tex** Contains the code used for assertion purposes.

```

108 \input import \import{checked}
109
110 \ifDefined\ProvidesPackage\then
111 \ProvidesPackage{texassert}
112 \fi
113
114 \newcount\countassertions
115 \newcount\countassertionspassed
116 \newcount\countassertionsfailed
117 \newif\ifassertmessageonly
118 \edef\temp{\the\catcode'\@}\catcode'\@=11
119
120 \let\assertDone=\iffalse
121 \def\unexpected{\toks0={unexpected!}}
122 \def\expected{\toks0={expected}}
123 \def\assert{\asserteq\the\toks0={expected}}
124 \def\assertTrue#1\assertDone{#1\then \expected
125 \else \unexpected\fi \assert}
126 \def\assertFalse#1\assertDone{#1\then \unexpected
127 \else \expected\fi \assert}
128
129 \def\resetassertions{%
130 \countassertions=0
131 \countassertionspassed=0
132 \countassertionsfailed=0
133 }

```

**\asserteq** Asserts that the two given string are equal, taking catcode into account.

```

134 \def\asserteq#1=#2{%
135 \global\advance\countassertions by1
136 \edef\assert@a{#1}%
137 % \message{assert@a: [\meaning\assert@a]}%
138 \edef\assert@b{#2}%
139 % \message{assert@b: [\meaning\assert@b]}%
140 \ifx\assert@a\assert@b\relax\relax
141 \global\advance\countassertionspassed by1
142 \else
143 \global\advance\countassertionsfailed by1
144 \message{...}%
145 \def\errmsg{*** assertion (\the\countassertions) failure:
146 '#1' not equal '#2' ***}%
147 \message{\errmsg}%
148 \ifassertmessageonly\else
149 \medbreak
150 \indent\indent{\errmsg}%
151 \medbreak\fi
152 \fi
153 }}

```

`\asserteqnocat` Asserts that the two given string are equal, disregarding any catcode differences.

```

154 \def\asserteqnocat#1=#2{%
155   \global\advance\countassertions by1
156   \edef\assert@a{#1}%
157   % \message{assert@a: [\meaning\assert@a]]}%
158   \edef\assert@b{#2}%
159   % \message{assert@b: [\meaning\assert@b]]}%
160   \checkeq\assert@a\assert@b
161   \ifeq
162     \global\advance\countassertionspassed by1
163   \else
164     \global\advance\countassertionsfailed by1
165     \message{...}%
166     \def\errmsg{*** assertion (\the\countassertions) failure:
167       '#1' not equal '#2' ***}%
168     \message{\errmsg}%
169     \ifassertmessageonly\else
170       \medbreak
171       \indent\indent{\errmsg}%
172       \medbreak\fi
173   \fi
174 }}

```

`\assertneq` Asserts that the two given string are not equal, taking catcode into account.

```

175 \def\assertneq#1=#2{%
176   \global\advance\countassertions by1
177   \edef\assert@a{#1}%
178   % \message{assert@a: [\meaning\assert@a]]}%
179   \edef\assert@b{#2}%
180   % \message{assert@b: [\meaning\assert@b]]}%
181   \ifx\assert@a\assert@b\relax\relax
182     \global\advance\countassertionsfailed by1
183     \message{...}%
184     \def\errmsg{*** assertion (\the\countassertions) failure:
185       '#1' equal '#2' ***}%
186     \message{\errmsg}%
187     \ifassertmessageonly\else
188       \medbreak
189       \indent\indent{\errmsg}%
190       \medbreak\fi
191   \else
192     \global\advance\countassertionspassed by1
193   \fi
194 }}

```

`\assertionssummary` Typesets a summary of the assertions made. Then reset to a state as if no assertion has been made.

```

195 \def\assertionssummary{%
196   \def\sp{ }%
197   \def\summary{%
198     Assertion Summary:
199     \the\countassertionspassed/\the\countassertions\sp
200     assertions passed i.e.
201     \the\countassertionsfailed/\the\countassertions\sp

```

```

202     assertions failed.}%
203 \message{\summary}%
204 \ifassertmessageonly\else
205     \medbreak
206     \summary
207 \fi}\resetassertions}
208
209 \catcode'\@=\temp % restore the original catcode for @

```

texassert.sty Used for packaging purposes.

```

210 \input{assert}

```

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## Change History

v0.0.1 – 2024-11-05

General: Initial version . . . . . 1

v0.0.2 – 2024-11-07

General: Migrate source files  
to `texassert.dtx` . . . . . 1