How to use \texttt{fntproof.tex} and \texttt{testfont.tex}

Dan Luecking*

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Abstract

The macro file \texttt{fntproof.tex} is a noninteractive version of D. E. Knuth’s \texttt{testfont.tex}. Instead of prompting for font names and commands, the user supplies them on the command line, or in a file.

1 Introduction

I used to often run \texttt{tex} on \texttt{testfont.tex}, which prompts for a font name and prompts for a command. Often, after ending the session, I would want to run almost the same command on almost the same font and would have to type almost everything over again, or else deal with my \texttt{tex} program’s rather primitive line recall/editing mechanism.

Since I run \texttt{tex} in a command shell which has better command line recall and rather better line editing capabilities than my \texttt{tex} has, I wrote \texttt{fntproof.tex} to give me the same capabilities as \texttt{testfont.tex}, but allow me to specify the font and the commands on the command line.

This is the documentation of \texttt{fntproof}. Since \texttt{testfont.tex} has no documentation outside of “The \textsc{METAFONT} book”, I am also also documenting it. The reader is assumed to have some minimal knowledge of plain \TeX, especially the \texttt{\font} command.

Apart from the fact that \texttt{fntproof} can read the fontname from the command line, there are few differences between \texttt{testfont.tex} and \texttt{fntproof.tex}:

- In \texttt{testfont}, the \texttt{\init} command prompts for a fontname, while \texttt{fntproof} arranges to read one typed on the command line or in a file.

- In \texttt{testfont}, \texttt{\mixture}, \texttt{\alternation} and \texttt{\series} issue three prompts, while in \texttt{fntproof} they read three arguments.

- In \texttt{testfont}, \texttt{\alphabet} and \texttt{\ALPHABET} issue a prompt, while in \texttt{fntproof} they read an argument.

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In a \LaTeX document, testfont redefines the \texttt{\table} command, destroying the \texttt{table} environment, while fntproof tries to detect \LaTeX and leave \texttt{\table} alone. The command \texttt{\fonttable} then takes the place of testfont’s \texttt{\table} command.

In testfont, the primitive \TeX command \texttt{\fontname} is also overwritten, while fntproof uses a different internal name for the same purpose. This require a couple of other minor differences to be discussed later.

There are a few useful commands added.

Like testfont, fntproof can print a table of the font’s characters and a bit of sample text and run other tests. It has noninteractive versions of all the interactive commands allowed by testfont.

## 2 Example command lines

- Produce sample text of cmr10:
  ```
  tex fntproof cmr10 \text\bye
  ```

- Produce a table of cmr10 and sample text of cmti10 (pdf output). Note the use of “\texttt{\init}” to change to the new font:
  ```
  pdftex fntproof cmr10 \table \init cmti10 \text\bye
  ```

- Produce a table and a test of digits for cmr10, only a table for cmti10 at 12pt:
  ```
  tex fntproof cmr10 \table\digits\init{cmti10 at 12pt}\table\bye
  ```

- Obtain a list of available commands and their meanings
  ```
  pdftex fntproof \help \end
  ```

Your command line interpreter may require you to quote or escape backslashes or other of its special characters in these examples. I am able to run all of these as-is in a command window under Windows XP using TeX Live 2008–2010. Of course the output appears in \texttt{fntproof.dvi} or \texttt{fntproof.pdf}.

## 3 The commands

A font can be specified by its TFM filename followed by a space (or a line end). Font filenames are allowed to contain most of \TeX’s special characters when fntproof is used. However, they cannot contain spaces or other whitespace characters, and they cannot begin with a left brace (\texttt{\{}). There are even more limitations on the TFM filename typed at textfont’s prompt, as most special \TeX characters cause some problem or other.

A command applies to the font most recently specified. The following commands are available. They are the same as those provided by the interactive version, testfont.tex, except they do not prompt for input, but require any arguments to follow the command.
• \sample \table \text
    \sample produces a table and some sample text; \table produces only the table,
    \text only the text.

• \mixture
    This takes three characters as arguments. The first character (the “background”)
    is mixed among all the characters from the second argument to the third. For
    example, “\mixture Xaz” produces

    XaXXaaXXXXaaaXa
    XbXXbbXXXXbbbXb
    ...

    and so on, until z.

• \alternation
    This is like \mixture, except “\alternation Xaz” produces lines like

    XaXaXaXaXaXaXaX
    XbXbXbXbXbXbXbX
    ...

    and so on.

• \series
    Like the previous two it takes 3 arguments, but produces a single line containing
    all the characters in the sequence. Thus, “\series Xaz” produces

    XaXbXcXdXeXfXgXhXiXjXkXlXmXnXoXpXqXrXsXtXuXvXwXxXyXzX

• \alphabet \ALPHABET
    These take one character as argument. It is the “background” and is mixed
    among all the lowercase, respectively uppercase letters. So “\ALPHABET x” is
    almost like “\series xAZ”, but also includes the characters Æ, Œ, and Ø, while
    “\alphabet X” is like “\series Xaz”, but also includes æ, œ, ø, and ß.

• \lowers \uppers \digits \names \punct
    These perform comprehensive tests of lowercase, uppercase, digits, names and
    punctuation. For example, \lowers is like

    \alphabet a \alphabet b ...

    and \digits is like

    \series 009 \series 109 \series 209 ...

• \bigtest \math
    \bigtest includes (more or less) all the previous commands. \math produces a
    large set of tests of math (the font should be a math alphabetic font like cmmi10).
• \help \init \noinit
\help produces a summary of available commands on the screen.
\init prepares for the next font. In testfont, it issues a prompt for a fontname and need not be invoke for the first font, which is prompted for immediately after input. In fntproof, it reads the following fontname, and it need not be used before the first font (see the examples in section 2), unless the filename begins with a \TeX special character.
\noinit turns off this automatic initialization. Use it when you want some text before the first font test, or if you want the current font to be used. Its syntax differs between fntproof and testfont, see below.

Note: In fntproof, \init examines the first following nonspace character. If that is a left brace (i.e., “{”) \init assumes the font name is contained between that left brace and the first matching right brace (“}”). Multi-part font specifications (such as “cmr10 at 12pt”) must be enclosed in braces, and this must be preceded by \init.

For the commands that take character arguments, the actual characters might not be printed, especially in symbol fonts. Instead, the glyphs in the corresponding positions will appear. Most printable ASCII characters can be used in the argument, but not “{”, “}”, “\” or space. In place of a literal character one can supply a numerical position in the font. This command:

\mixture X{#97}{#122}

has the same effect as this one:

\mixture Xaz

The numeric part of the argument (everything after after the #) can be (probably) any valid \TeX number. Your command line interpreter may require you to escape or “quote” the double quote marks which are used in \TeX for hexadecimal, the single quote marks used for octal or the back quote used in character code notation.

A numerical argument must be enclosed in braces: a “#” not in braces (or alone in braces) will be taken literally. For example,

\mixture #120az

would read “#”, “1” and “2” as the arguments and the rest, “0az”, as plain \TeX code (i.e., characters to be printed).

It should be noted that the implementation of \series does not allow any ligatures or kerns between adjacent characters. This is also true of the commands based on \series: \alphabet, \ALPHABET, \lowers, \uppers, and \digits. It is true for both testfont and fntproof, which use the same internal implementation. If one wants to test these properties of a font, one must type in ones own text (see the following section).

Another limitation: in the “\alphabet” and “ALPHABET” commands, if the font has an encoding other than OT1, then the characters æ, œ, ø, ß, Æ, Œ, and Ø may not appear as advertised, since the implementation accesses them by position number. For PostScript fonts, a black box may appear where these characters should be.

In addition to the commands listed, which are common to fntproof and testfont, fntproof supplies the following extra commands, not available in testfont.
\textbf{\texttt{\textbackslash initcurrentfont}}

Use this to perform the functions of \texttt{\textbackslash init} on the current font. This would normally be preceded by commands selecting the desired font. See section 6 for a \LaTeX\ example.

\textbf{\texttt{\textbackslash noinit}}

In \texttt{testfont}, the only way to use this is to say \texttt{\textbackslash let\textbackslash noinit=}! before inputting \texttt{testfont.tex}. This cancels the immediate prompt for a font filename. But in \texttt{fntproof}, \texttt{\textbackslash noinit} can also be used immediately \textit{after} inputting \texttt{fntproof}. Either use cancels \texttt{fntproof}'s assumption that the first following word is the name of the font to be selected. This allows ordinary text to be inserted before selecting a font. After this, the command \texttt{\textbackslash init} allows a font to be specified.

\textbf{\texttt{\textbackslash headersfalse \headerstrue \theheader}}

A side effect of the \texttt{\textbackslash init} command (including one implicitly invoked by a font name following the input of \texttt{fntproof}) is the printing of a single header line similar to the following:

\begin{verbatim}
Test of cmti10 on July 31 at 1244
\end{verbatim}

Use \texttt{\textbackslash headersfalse} to force the omission of all such headers for any subsequent font. Use \texttt{\headerstrue} to resume the default behavior. In any circumstance, the header text can be printed using \texttt{\theheader}.

\textbf{\texttt{\textbackslash thisfont \getthisfont}}

The macro \texttt{\thisfont} produces the name of the font most recently specified by an explicit or implicit \texttt{\textbackslash init} or by \texttt{\textbackslash initcurrentfont}. If no such initialization was done, \texttt{\getthisfont} will cause \texttt{\thisfont} to be defined to the text produced by the command sequence \texttt{\fontname\font} (i.e., the tfm filename of the current font—plus any \texttt{"scaled"} or \texttt{“at”} clause).

\textbf{\texttt{\fonttable}}

As already mentioned, this is the alternative to \texttt{\table} that must be used in \LaTeX. It can also be used in plain \TeX.

\section{Other \TeX\ commands}

\TeX\ commands besides the above can be inserted at any point except between \texttt{\textbackslash init} and the next fontname. No guarantee is given that they they will have the expected effect. Text will be printed in the whatever font is current. No text should be typed between \texttt{“fntproof”} and the first fontname or else it will be mistaken for a font (but see \texttt{\noinit} above and examples of its use below).

If the command line does not end in \texttt{\textbackslash end} or \texttt{\bye}, \TeX will wait for more input in its usual way, with a \texttt{“*”} prompt. If additional commands from the above list are entered (except \texttt{\textbackslash init}), they will be applied to the previously named font. Moreover, a new font name can be entered (after \texttt{\textbackslash init}). Of course, any plain \TeX\ commands can be entered. The session can be ended by entering \texttt{\textbackslash end} or \texttt{\bye}. 

5
5 Use as a macro file

Like testfont.tex, fntproof.tex allows the commands to be used in a file rather than interactively, or on the command line. One can do this by writing “\let\noinit=!” before inputting testfont or fntproof. This is somewhat more useful for fntproof than for testfont as all the fntproof commands are noninteractive.

Unlike testfont, fntproof also allows you to simply type “\noinit” immediately after inputting it, for the same effect. For example, with testfont one would initialize the font oneself and then issue commands:

\let\noinit=! \input testfont
Ordinary text in default font.
\def\fontname{cmti10}\startfont \table \text \bye

Note that “initializing a font” after testfont is loaded amounts to defining \fontname and then using the \startfont command. The above example will produce a table and sample text of cmti10. Note that \startfont alone will not work. If both steps are omitted, the \table command will build a table of the current font, but certain preparatory steps will not be taken and some commands (but not \table) will produce errors.

The corresponding fntproof method would be the following. Note that this could also be typed on the command line (all on one line) after the tex command (in that case the “\input” would be omitted):

\input fntproof \noinit
Ordinary text in default font.
\init cmti10 \table \text \bye

Note that testfont.tex causes the \tex primitive command \fontname to be redefined. The macros in fntproof do not do this, but instead use \thisfont for the same internal purposes as testfont uses \fontname.

If one wanted to initialize a font immediately (with no intervening text in some other font), even this \noinit hack is unnecessary:

\input fntproof cmr10 \table \text \bye

This would perform the auto-init on cmr10. In this case, any \headersfalse command would have to be put just before the font name. Otherwise, it need only come before the next \init command.

In testfont, a command like \mixture would produce three prompts to get the character or numeric arguments. For the corresponding fntproof commands, these arguments must be supplied and no interactive prompt occurs. One can get around these interactive prompts in testfont, but it is rather inconvenient:

• with testfont:

\let\noinit! \input testfont
Some text in default font. Here is a mixture in cmti:
• with fntproof:

\input fntproof \noinit
Some text in default font. Here is a mixture in cmti:
\init cmti10 \mixture Xaz \bye

For completeness, here are the other ways to avoid the interactive prompt when using testfont (right), compared to each of the fntproof commands (left).

• \series Xaz ⇒ \chardef\background'X\!\doseries{'a}{'z}\par
• \alphabet X ⇒ \chardef\background'X\complower
• \ALPHABET X ⇒ \chardef\background'X\compupper

In the \doseries command, the arguments can be numbers: \doseries{97}{122} is the same as \doseries{'a}{'z}. You can use numbers in the \chardef commands. For example “\chardef\background88” is the same as “\chardef\background‘X”. Note: a space (or end-of-line) after explicit digits is almost mandatory to terminate the number before any following macros are expanded.

Instead of “\init ⟨tfmname⟩”, one can use normal font selection commands, followed by “\initcurrentfont”, and then the testing commands (e.g., \fonttable, \text). For example,

\input fntproof
\font\x=cmdunh10 at 12pt \x
\initcurrentfont \table \text \bye

See the next section for an example in \LaTeX. To do this with testfont would require the following incantations:

\let\originalfontname\fontname
\let \noinit=!\input testfont
\font\x=cmdunh10 at 12pt \x
edef\fontname{\originalfontname\font}\startfont \table \text \bye

Note that \init, \initcurrentfont and some of the testing commands change some \TeX parameters. This could affect the typesetting of the rest of the document, so it might be wise to enclose a session of font testing in a group, if your document contains other material.

Note also that the mere loading of fntproof or testfont invokes the following settings:
These are suitable for the running of tests on fonts. If the rest of your document needs
different parameters, it is your responsibility to reset these afterward. There are also
numerous internal macros used by both testfont and fntproof that are not protected
by having @ in there name. This is another reason to input the macro file and use the
testing macros inside a group.

Finally, testfont turns off page numbering (in plain TeX) when loaded.

6 Use with \LaTeX

In \LaTeX, printable text has to come after \begin{document} so a minimal command
line could be (typed without pressing [Enter] or [Return]):

\begin{verbatim}
latex fntproof \noinit \documentclass{article}\begin{document}
\init cmr10 \fonttable \end{document}
\end{verbatim}

Thus with \LaTeX, fntproof might better be used in a file. Note also that \fonttable
is used instead of \table to avoid destroying \LaTeX’s table environment. For example,

\begin{verbatim}
\documentclass[12pt]{article}
\begin{document}
\input fntproof
\fontencoding{T1}\fontfamily{bch}\selectfont
\initcurrentfont
\fonttable
\end{document}
\end{verbatim}

This would produce a table of the Bitstream Charter font.

The above font selection commands ultimately load the TFM file bchr8t magnified
to 12pt. Thus, the header text actually looks something like this:

Test of bchr8t at 12.0pt on October 7, 2010 at 1649

Moreover, “\thisfont” will acquire the definition “bchr8t at 12.0pt”.

I have not tested testfont.tex much in \LaTeX. After the \let\noinit=! hack, inputting testfont
causes an error because \nopagenumbers is undefined. Then the
command \table, \text, or \sample cause an error because \sevenrm is undefined,
but otherwise proceed correctly.
7 History

2009/05/05 – first version
2009/07/31 – add \noinit, \ifheaders, \theheader
2009/11/12 – revised documentation (comments)
2010/01/03 – further documentation revisions
2010/10/11 – documentation moved to separate file, added \initcurrentfont and \getthisfont.

8 Appendix

The output of fntproof’s \help command:

=== Main commands =================
\init switches to another font;
\end or \bye finishes the run;
\table prints the font layout in tabular format;
\fonttable must be used instead of \table in LaTeX;
\text prints a sample text, assuming TeX text font conventions;
\sample combines \table and \text;
\mixture mixes a background character with a series of others;
\alternation interleaves a background character with a series;
\alphabet prints all lowercase letters within a given background
\ALPHABET prints all uppercase letters within a given background
\series prints a series of letters within a given background
\lowers prints a comprehensive test of lowercase;
\uppers prints a comprehensive test of uppercase;
\digits prints a comprehensive test of numerals;
\math prints a comprehensive test of TeX math italic;
\names prints a text that mixes upper and lower case;
\punct prints a punctuation test;
\bigtest combines many of the above routines;
\help repeats this message;
and you can use ordinary TeX commands (e.g., to \input a file).

=== More commands =================
\noinit turns off automatic initialization of the first word as a font;
\headersfalse \headerstrue turn off/resume printing of header text;
\theheader print the header text;
\thisfont print the name of font specified by \init;
\getthisfont define \thisfont to be the current font;
======================================================================
The output of testfont’s \help command:

\init switches to another font;
\end or \bye finishes the run;
\table prints the font layout in tabular format;
\text prints a sample text, assuming TeX text font conventions;
\sample combines \table and \text;
\mixture mixes a background character with a series of others;
\alternation interleaves a background character with a series;
\alphabet prints all lowercase letters within a given background
\ALPHABET prints all uppercase letters within a given background
\series prints a series of letters within a given background;
\lowers prints a comprehensive test of lowercase;
\uppers prints a comprehensive test of uppercase;
\digits prints a comprehensive test of numerals;
\math prints a comprehensive test of TeX math italic;
\names prints a text that mixes upper and lower case;
\punct prints a punctuation test;
\bigtest combines many of the above routines;
\help repeats this message;
and you can use ordinary TeX commands (e.g., to \input a file).

Knuth’s original testfont.tex comment:
% A testbed for font evaluation (see The METAFONTbook, Appendix H)