The program `nfssfont`

Frank Mittelbach*

2023/11/07

> This file is maintained by the LaTeX Project team.
> Bug reports can be opened (category `latex`) at
> https://latex-project.org/bugs.html.

1 Introduction

Within the NFSS distribution there is a LaTeX file `nfssfont.tex` which can be used to test new fonts, produce font tables showing all characters, etc. This is an adaption of a program originally written by Don Knuth.

When you run this file through LaTeX you will be asked to enter the name of the font to test. Your answer should be the external font name without any extension, e.g. `cmr10` (Computer Modern Roman 10pt) or `yinit` (Yannis Haralambous' Initial font).

Alternatively (since version 2.1), you can press ⟨return⟩ at this point. In that case a dialog is started that asks you for the font characteristics in NFSS notation, i.e., first for the encoding scheme (default `T1`), then for the family name (default `cmr`), then for the series (default `m`), then for the shape (default `n`), and finally for the size (default `10pt`).

You are then requested to enter a command. Probably the most important one is `\table`, which will produce a font chart. To switch to a new test font, type `\init`; to finish the test, type `\bye`; and to learn about all the other possible tests type `\help`.

This is at the moment only a crude adaption of the test program for the Computer Modern fonts by Donald Knuth.

2 A driver for this document

The next bit of code contains the documentation driver file for TeX, i.e., the file that will produce the documentation you are currently reading. It will be extracted from this file by the DOCSTRIP program.

```
1 ⟨*driver⟩
2 \documentclass{ltxdoc}
3 % \OnlyDescription   % comment out for implementation details
4 \begin{document}
```

---

*Adapted from code written by Donald E. Knuth

```
5    \DocInput{nfssfont.dtx}
6 \end{document}
7 ⟨/driver⟩
```

3   The code

A testbed for font evaluation (see The METAFONTbook, Appendix H) changed for LaTeX with NFSS.

This program should get a complete rewrite some day or at least some code documentation. Any volunteers?

```
 8 ⟨*code⟩
 9 \documentclass{article}
10 \nofiles
11 \setlength\textwidth{470pt}
12 \setlength\oddsidemargin{0pt}
13 \addtolength\textheight{7\baselineskip}
14 \addtolength\topmargin{-3\baselineskip}
15
16 \def\sevenrm{\fontencoding{OT1}\fontsize{7}{9pt}\rmfamily}
17
18 \typeout{*********************************************}
19 \typeout{* NFSS font test program version <\nfssfontfileversion>}
20 \typeout{*}
21 \typeout{* Follow the instructions}
22 \typeout{*********************************************}
23 \typeout{}
24
25 \tracinglostchars=0
26 \tolerance=1000
27 \raggedbottom
28 \parindent=0pt
29 %\newlinechar='@              %FMi
30 \hyphenpenalty=200
31 \doublehyphendemerits=30000
32
33 \newcount\m \newcount\n \newcount\p \newdimen\dim
34 \chardef\other=12
35
36 \def\today{\ifcase\month\or
37   January\or February\or March\or April\or May\or June\or
38   July\or August\or September\or October\or November\or December\fi
39   \space\number\day, \number\year}
40 \def\hours{\n=\time \divide\n 60
41   \m=-\n \multiply\m 60 \advance\m \time
42   \twodigits\n\twodigits\m}
43 \def\twodigits#1{\ifnum #1<10 0\fi \number#1}
```

We first ask for a real external font name...

```
43 \def\init{%
44 \typein[\currfontname]%
45   {Input external font name, e.g., cmr10^^J%
46    (or <enter> for NFSS classification of font):}%
```

If the answer is a real font name (like "cmr10") then we have no idea what the encoding of this font is, so in this case we record the word "unknown" and internally assume T1 encoding. Commands other than `\table` are then most likely going to fail, unless that assumption was correct.

```
47 \def\encoding{unknown}%
48 \fontencoding{T1}\selectfont
```

If the user answers with "return" we ask for the NFSS classification of the font in form of encoding, family, series, shape, and size offering a default each time.

```
49 \ifx\currfontname\empty
50 \typein[\encoding]{^^J^^J*** NFSS classification
51                     ***^^J^^JFont encoding [T1]:}%
52 \ifx\encoding\empty
53   \fontencoding{T1}%
54   \def\encoding{T1}%
55 \else
```

Depending on the chosen encoding we have the problem, that the encoding support information may not be available (only for T1 and OT1 this is preloaded in the kernel, all other encodings normally need a declaration in the preamble). So here we attempt to load this support file even though it is actually already too late for this.

```
56   \edef\next{%
57     \lowercase{\def\noexpand\next{\encoding enc.def}}}%
58   \next
59   \makeatletter
60   \InputIfFileExists\next
61       {}%
```

If the encoding support file is not found this may indicate an error, eg something misspelled. However, it may equally mean that we dealing with a math font encoding for which no encoding support is available.

```
62       {\PackageWarningNoLine{nfssfont}%
63        {Encoding file '\next' not found.%
64          \MessageBreak
65           You might have misspelled the name of the encoding
66          \MessageBreak
67           or perhaps this encoding is not a text encoding,
68         \MessageBreak
69           in which case you will probably only be able to
70         \MessageBreak
71           run the \noexpand\table command successfully}%
```

But actually the situation is even worse, as some math encodings do have such support files. So for them we need to make the encoding known to NFSS in some other way, otherwise we could not even find the external font name, let alone typesetting a `\table`.

```
72        \expandafter\let\csname T@\encoding\endcsname\empty
73        }%
74   \makeatother
75   \let\next\relax
76   \fontencoding\encoding
77 \fi
78 \typein[\family]{Font family [cmr]:}%
```

```
79   \relax
80   \ifx\family\empty
81     \fontfamily{cmr}%
82   \else
83     \fontfamily\family
84   \fi
85   \typein[\series]{Font series [m]:}%
86   \ifx\series\empty
87     \fontseries{m}%
88   \else
89     \fontseries\series
90   \fi
91   \typein[\shape]{Font shape [n]:}%
92   \ifx\shape\empty
93     \fontshape{n}%
94   \else
95     \fontshape\shape
96   \fi
97   \typein[\size]{Font size [10pt]:}%
98   \ifx\size\empty
99     \fontsize{10}{10}%
100  \else
101    \fontsize\size\size
102  \fi
```

Then select the font and assign it to \currfontname.

```
103    \selectfont\edef\currfontname{\fontname\font}%
104  \fi
105  \startfont
```

Finally we ask for some "action" and offer \table\bye as default—basically I got tired of having to type that in each time. If some other action is given you end with a * prompt and have to finish the run with \bye yourself eventually.

```
106  \typein[\action]{Now type a test command or
107    \string\help\space for help [ \string\table\space\string\bye\space]:}%
108  \ifx\action\empty
109    \expandafter\table\expandafter\bye
110  \else
111    \expandafter\action
112  \fi
113 }

114 \def\startfont{\font\testfont=\currfontname
115   \leftline{\sevenrm Test of font \currfontname\unskip\ (encoding
116            \encoding\unskip) on \today\ at \hours}
117   \medskip
118   \testfont \setbaselineskip
119   \ifdim\fontdimen6\testfont<10pt \rightskip=0pt plus 20pt
120   \else\rightskip=0pt plus 2em \fi
121   \spaceskip=\fontdimen2\testfont % space between words (\raggedright)
122   \xspaceskip=\fontdimen2\testfont \advance\xspaceskip
123   by\fontdimen7\testfont}

124 {\catcode`\|=0 \catcode`\\=\other
125 |gdef|help{|message{%
126 \init switches to another font;^^J%
```

4

```
127 \stop or \bye finishes the run;^^J%
128 \table prints the font layout in tabular format;^^J%
129 \text prints a sample text, assuming TeX text font conventions;^^J%
130 \sample combines \table and \text;^^J%
131 \mixture mixes a background character with a series of others;^^J%
132 \alternation interleaves a background character with a series;^^J%
133 \alphabet prints all lowercase letters within a given background;^^J%
134 \ALPHABET prints all uppercase letters within a given background;^^J%
135 \series prints a series of letters within a given background;^^J%
136 \lowers prints a comprehensive test of lowercase;^^J%
137 \uppers prints a comprehensive test of uppercase;^^J%
138 \digits prints a comprehensive test of numerals;^^J%
139 \math prints a comprehensive test of TeX math italic;^^J%
140 \names prints a text that mixes upper and lower case;^^J%
141 \punct prints a punctuation test;^^J%
142 \bigtest combines many of the above routines;^^J%
143 \help repeats this message;^^J%
144 and you can use ordinary TeX commands (e.g., to \input a file).}}}
145
146 \def\setbaselineskip{\setbox0=\hbox{\n=0
147 \loop\char\n \ifnum \n<255 \advance\n 1 \repeat}
148 \baselineskip=6pt \advance\baselineskip\ht0 \advance\baselineskip\dp0 }
149 \def\setchar#1{{\escapechar-1\message{\string#1 character = }%
150   \def\do##1{\catcode`##1=\other}\dospecials
151   \read-1 to\next
152   \expandafter\finsetchar\next\next#1}}
153 \def\finsetchar#1#2\next#3{\global\chardef#3=`#1
154   \ifnum #3=`\# \global\chardef#3=#2 \fi}
155 \def\promptthree{\setchar\background
156   \setchar\starting \setchar\ending}
157
158 \def\mixture{\promptthree \domix\mixpattern}
159 \def\alternation{\promptthree \domix\altpattern}
160 \def\mixpattern{\0\1\0\0\1\1\0\0\0\1\1\1\0\1}
161 \def\altpattern{\0\1\0\1\0\1\0\1\0\1\0\1\0\1\0\1\0}
162 \def\domix#1{\par\chardef\0=\background \n=\starting
163   \loop \chardef\1=\n #1\endgraf
164   \ifnum \n<\ending \advance\n 1 \repeat}
165
166 \def\!{\discretionary{\background}{\background}{\background}}
167 \def\series{\promptthree \!\doseries\starting\ending\par}
168 \def\doseries#1#2{\n=#1\loop\char\n\!\ifnum\n<#2\advance\n 1 \repeat}
169 \def\complower{\!\doseries{`a}{`z}\doseries{'31}{'34}\par}
170 \def\compupper{\!\doseries{`A}{`Z}\doseries{'35}{'37}\par}
171 \def\compdigs{\!\doseries{`0}{`9}\par}
172 \def\alphabet{\setchar\background\complower}
173 \def\ALPHABET{\setchar\background\compupper}
174
175 \def\lowers{\docomprehensive\complower{`a}{`z}{'31}{'34}}
176 \def\uppers{\docomprehensive\compupper{`A}{`Z}{'35}{'37}}
177 \def\digits{\docomprehensive\compdigs{`0}{`4}{`5}{`9}}
178 \def\docomprehensive#1#2#3#4#5{\par\chardef\background=#2
179   \loop{#1} \ifnum\background<#3\m=\background\advance\m 1
180   \chardef\background=\m \repeat \chardef\background=#4
```

5

```
181   \loop{#1} \ifnum\background<#5\m=\background\advance\m 1
182   \chardef\background=\m \repeat}

183 \def\names{ {\AA}ngel\aa\ Beatrice Claire
184   Diana \'Erica Fran\c{c}oise Ginette H\'el\`ene Iris
185   Jackie K\=aren {\L}au\.ra Mar{\'\i}a N\H{a}ta{\l}{\u\i}e {\O}ctave
186   Pauline Qu\^eneau Roxanne Sabine T\~a{\'\j}a Ur\v{s}ula
187   Vivian Wendy Xanthippe Yv{\o}nne Z\"azilie\par}
188 \def\punct{\par\dopunct{min}\dopunct{pig}\dopunct{hid}
189   \dopunct{HIE}\dopunct{TIP}\dopunct{fluff}
190   \$1,234.56 + 7/8 = 9\% @ \#0\par}
191 \def\dopunct#1{#1,\ #1:\ #1;\ `#1'\ ?`#1?\ !`#1!\ (#1)\ [#1]\
192                 #1*\ #1.\par}
193
194 \def\bigtest{\sample
195   hamburgefonstiv HAMBURGEFONSTIV\par
196   \names \punct \lowers \uppers \digits}
197
198 \def\math{\textfont1=\testfont \skewchar\testfont=\skewtrial
199   \mathchardef\Gamma="100 \mathchardef\Delta="101
200   \mathchardef\Theta="102 \mathchardef\Lambda="103 \mathchardef\Xi="104
201   \mathchardef\Pi="105 \mathchardef\Sigma="106 \mathchardef\Upsilon="107
202   \mathchardef\Phi="108 \mathchardef\Psi="109 \mathchardef\Omega="10A
203   \def\ii{i} \def\jj{j}
204   \def\\##1{|##1|+}\mathtrial
205   \def\\##1{##1_2+}\mathtrial
206   \def\\##1{##1^2+}\mathtrial
207   \def\\##1{##1/2+}\mathtrial
208   \def\\##1{2/##1+}\mathtrial
209   \def\\##1{##1,{}+}\mathtrial
210   \def\\##1{d##1+}\mathtrial
211   \let\ii=\imath \let\jj=\jmath \def\\##1{\hat##1+}\mathtrial}
212 \newcount\skewtrial \skewtrial='177
213 \def\mathtrial{$\\A \\B \\C \\D \\E \\F \\G \\H \\I \\J \\K \\L \\M \\N
214   \\O \\P \\Q \\R \\S \\T \\U \\V \\W \\X \\Y \\Z \\a \\b \\c \\d \\e \\f
215   \\g \\h \\\ii \\\jj \\k \\l \\m \\n \\o \\p \\q \\r \\s \\t \\u \\v \\w
216   \\x \\y \\z \\\alpha \\\beta \\\gamma \\\delta \\\epsilon \\\zeta
217   \\\eta \\\theta \\\iota \\\kappa \\\lambda \\\mu \\\nu \\\xi \\\pi
218   \\\rho \\\sigma \\\tau \\\upsilon \\\phi \\\chi \\\psi \\\omega
219   \\\vartheta \\\varpi \\\varphi \\\Gamma \\\Delta \\\Theta \\\Lambda
220   \\\Xi \\\Pi \\\Sigma \\\Upsilon \\\Phi \\\Psi \\\Omega \\\partial
221   \\\ell \\\wp$\par}
222 \def\mathsy{\begingroup\skewtrial='060 % for math symbol font tests
223   \def\mathtrial{$\\A \\B \\C \\D \\E \\F \\G \\H \\I \\J \\K \\L
224    \\M \\N \\O \\P \\Q \\R \\S \\T \\U \\V \\W \\X \\Y \\Z$\par}
225   \math\endgroup}
```

Here we have to ensure that we use a suitable encoding otherwise our octal and hexadecimal constants will appear in whatever encoding the current font is.

```
226 \def\oct#1{\hbox{\fontencoding{OT1}\rmfamily\'{}\kern-.2em\itshape
227           #1\/\kern.05em}}% octal constant
228 \def\hex#1{\hbox{\fontencoding{OT1}\rmfamily
229           \H{}\ttfamily#1}}% hexadecimal constant
230 \def\setdigs#1"#2{\gdef\h{#2}% \h=hex prefix; \0\1=corresponding octal
231   \m=\n \divide\m by 64 \xdef\0{\the\m}%
```

```
232  \multiply\m by-64 \advance\m by\n \divide\m by 8 \xdef\1{\the\m}}
233 \def\testrow{\setbox0=\hbox{\penalty 1\def\\{\char"\h}%
234  \\0\\1\\2\\3\\4\\5\\6\\7\\8\\9\\A\\B\\C\\D\\E\\F%
235 \global\p=\lastpenalty}} % \p=1 if none of the characters exist
236 \def\oddline{\cr
237   \noalign{\nointerlineskip}
238   \multispan{19}\hrulefill&
239   \setbox0=\hbox{\lower 2.3pt\hbox{\hex{\h x}}}\smash{\box0}\cr
240   \noalign{\nointerlineskip}}
241 \newif\ifskipping
242 \def\evenline{\loop\skippingfalse
243  \ifnum\n<256 \m=\n \divide\m 16 \chardef\next=\m
244  \expandafter\setdigs\meaning\next \testrow
245  \ifnum\p=1 \skippingtrue \fi\fi
246  \ifskipping \global\advance\n 16 \repeat
247  \ifnum\n=256 \let\next=\endchart\else\let\next=\morechart\fi
248  \next}
249 \def\morechart{\cr\noalign{\hrule\penalty5000}
250  \chartline \oddline \m=\1 \advance\m 1 \xdef\1{\the\m}
251  \chartline \evenline}
252 \def\chartline{&\oct{\0\1x}&&\:&&\:&&\:&&\:&&\:&&\:&&\:&&\:&&}
253 \def\chartstrut{\lower4.5pt\vbox to14pt{}}
254 \def\table{$$\global\n=0
255   \halign to\hsize\bgroup
256     \chartstrut##\tabskip0pt plus10pt&
257     &\hfil##\hfil&\vrule##\cr
258     \lower6.5pt\null
259     &&&\oct0&&\oct1&&\oct2&&\oct3&&\oct4&&\oct5&&\oct6&&\oct7&\evenline}
260 \def\endchart{\cr\noalign{\hrule}
261   \raise11.5pt\null&&&\hex 8&&\hex 9&&\hex A&&\hex B&
262   &\hex C&&\hex D&&\hex E&&\hex F&\cr\egroup$$\par}
263 \def\:{\setbox0=\hbox{\noboundary\char\n\noboundary}%
264   \ifdim\ht0>7.5pt\reposition
265   \else\ifdim\dp0>2.5pt\reposition\fi\fi
266   \box0\global\advance\n 1 }
267 \def\reposition{\setbox0=\vbox{\kern2pt\box0}\dim=\dp0
268   \advance\dim 2pt \dp0=\dim}
269 \def\centerlargechars{
270   \def\reposition{\setbox0=\hbox{$\vcenter{\kern2pt\box0\kern2pt}$}}}

271 \def\text{{\advance\baselineskip-4pt
272 \setbox0=\hbox{abcdefghijklmnopqrstuvwxyz}
273 \ifdim\hsize>2\wd0
274    \ifdim 15pc>2\wd0 \hsize=15pc \else \hsize=2\wd0 \fi
275 \fi
276 On November 14, 1885, Senator \& Mrs.~Leland Stanford called together
277 at their San Francisco mansion the 24~prominent men who had been
278 chosen as the first trustees of The Leland Stanford Junior University.
279 They handed to the board the Founding Grant of the University, which
280 they had executed three days before. This document---with various
281 amendments, legislative acts, and court decrees---remains as the
282 University's charter.  In bold, sweeping language it stipulates that
283 the objectives of the University are ``to qualify students for
284 personal success and direct usefulness in life; and to promote the
285 publick welfare by exercising an influence in behalf of humanity and
```

```
286 civilization, teaching the blessings of liberty regulated by law, and
287 inculcating love and reverence for the great principles of government
288 as derived from the inalienable rights of man to life, liberty, and
289 the pursuit of happiness.'' \moretext
290 (!`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS!)\par}}
291 \def\moretext{?`But aren't Kafka's Schlo\ss{} and \AE sop's
292 \OE uvres often na\"\i ve vis-\`a-vis the d\ae monic ph\oe nix's
293 official r\^ole in fluffy souffl\'es? }
294 \def\omitaccents{\let\moretext=\relax}
295
296 \def\sample{\table\text}

297 \def\bye{\end{document}}
```

The redefinition of `\typeout` around the `\begin{document}` prevents LATEX from reporting that there is no `.aux` file. This is a bad hack, I agree :-)

```
298 \let\oldtypeout\typeout
299 \def\typeout#1{}
```

And another bad hack: to be able to load an encoding definition file after `\begin{document}` I disable the preamble only setting.

```
300 \makeatletter
301 \let\@preamblecmds\@empty
302 \makeatother
303
304 \begin{document}
305 \let\typeout\oldtypeout
306
307 \ifx\noinit!\else\expandafter\init\fi
308 ⟨/code⟩
```