KP-fonts in plain TeX

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The very large font family *kpfonts* [1] (by Christophe Caignaert) is known in LaTeX world because there is the NFSS support for these fonts. There are many independent variations and features supported by the *kpfonts*. This font family can be loaded in plain TeX using `\input kp-fonts`. Macros from $\mathcal{CS}$plain [2] are used in this case. This article describes the main concept of the macros from $\mathcal{CS}$plain which gives fonts support for plain TeX users. A new feature of these macros (font modifiers) is implemented in $\mathcal{CS}$plain from May 2016.

The section 2 in this article includes a documentation of *kpfonts* if the family is loaded using `\input kp-fonts`. This gives an illustration of power of $\mathcal{CS}$plain font support. Finally, section 3 includes a basic notes for macro programmers.

Note that all features of $\mathcal{CS}$plain macros described here can be used in all common plain TeX formats: generated by `etex.src` or Knuth's original plain TeX format or $\mathcal{CS}$plain. There is no substantial differences between them. Of course, $\mathcal{CS}$plain preloads a basic set of macros (for resizing) in its format but if this isn't done then the little set of macros is read (from $\mathcal{CS}$plain package) automatically and additionally.

Contents

1 Font families in $\mathcal{CS}$plain macros

1.1 Basics

The main principle of font macros in $\mathcal{CS}$plain is to keep the plain TeX philosophy. This means:

- use straightforward macros,
- font-files (where a font family is loaded) use directly `\font` primitive,
- leave core font macros for users `\rm`, `\bf`, and `\it` almost unchanged.

User can select a font family by `\input font-file`. The "font-file" loads typically four fonts of one family for usage in `\rm`, `\bf`, `\it` and `\bi` macros. But the font-file can give more possibilities using "font modifiers" (see bellow).

The fonts in a font family can be selected by `\rm`, `\bf`, `\it` and `\bi` macros. These macros are defined similarly like in plain TeX:

```
\def\rm{\fam0\tenrm}      % in plain TeX: \def\rm{\fam\z@\tenrm}
\def\bf{\fam\bffam \tenbf} % in plain TeX: \def\bf{\fam\bffam\tenbf}
\def\it{\fam\itfam \tenit} % in plain TeX: \def\it{\fam\itfam\tenit}
\def\bi{\fam\bifam \tenbi} % in plain TeX: undefined
```

The macros above use native font selectors `\tenrm`, `\tenbf`, `\tenit` and `\tenbi` declared by `\font` primitive in the font-file. Once these four selectors are declared, they can be resized to arbitrary size. For example:

```
\def\sizespec{at12pt}\resizeall
```

resizes the font selectors `\tenrm`, `\tenbf`, `\tenit` and `\tenbi` to 12 pt with the same fonts (or with their appropriate optical modifications if they are available and `\dgsize` is set). The name `\ten..` is here only for historical reasons and it has nothing to do with real font size selected. For more information about resizing see the article [3] and comments in the file `csfontsm.tex` where this feature is implemented.

User can use macros `\rm`, `\bf`, `\it`, `\bi`[1] in a selected size. A more comfortable user environment for resizing with macros `\typosize`, `\typoscale` and `\thefontsize` is prepared in OPmac macro package [4] which is a part of $\cal{CS}$plain macros too. The OPmac macros for font resizing set all size-dependent internal parameters and sizes for math typesetting too. See section 2 in the OPmac documentation [5].

Summary: the meaning of `\tenrm`, `\tenbf`, `\tenit` and `\tenbi` selectors depends on context: on a font family chosen by `\input font-file` and on selected size.

Users of NFSS from LaTeX may ask: why there isn't a possibility of independent selectors for "weight" and "shape"? The answer is: We need not it and we want to keep the plain TeX simplicity. For example OPmac provides the `\em` macro for emphasizing. It works like `\rm->\it` `\it->\rm`, `\bf->\bi`, `\bi->\bf` and it adds the necessary italic corrections. User can define analogous simple macro if it is needed.

1.2 Prepared font files

The font-files ready to use are packed to the $\cal{CS}$plain package. You can select one line from the following list:

```
\input lmfonts       % Latin Moder fonts

\input ctimes        % Times font family
\input chelvet       % Helvetica font family
\input cavantga      % AvantGarde font family
\input cbookman      % Bookman font family
\input cncent        % NewCenturySchlbk font family
\input cpalatin      % Palatino font family

\input cs-termes     % TeX Gyre Termes
\input cs-adventor   % TeX Gyre Adventor
\input cs-bonum      % TeX Gyre Bonum
\input cs-heros      % TeX Grye Heros
\input cs-pagella    % TeX Gyre Pagella
\input cs-schola     % TeX Gyre Schola
\input cs-cursor     % TeX Gyre Cursor

\input cs-antt       % Antykwa Torunska
\input cs-polta      % Antykwa Poltawskiego

\input cs-charter    % Charter
\input cs-bera       % Bera
\input cs-arev       % ArevSans
\input cs-libertine  % Linux Libertine

\input kp-fonts      % KPfonts
```

You need not to remember these font-file names. If you are using OPmac macros then the macro `\fontfam[Family Name]` is ready to use. It does the necessary `\input`. If you give an unknown family

---

[1] Note that `\tentt` is resized too, so `\tt` macro can be used in selected size too. And more font selectors can be resized when macro programmer registers a font selector for resizing using `\regfont`.

name or give simply [?] as a parameter then the list of possibilities is printed to the terminal and to the log file in the form:

```
\fontfam: unknown font family [?] (8t). Choose:
=== Fonts derived from Computer Modern ===
 [LM fonts]  {\caps \sans \ttset \slant \nbold \ttprop \ttlight \ttcond \upital
 \quotset \dunhill } {\rm \it \bf \bi } +AMS (8t 8z 8q 8y 8v U)
=== Adobe 35 fonts ===
 [Times]  {\caps } {\rm \it \bf \bi \tt } +TX (8t 8z)
 [Helvetica]  {\cond \caps } {\rm \it \bf \bi \tt } +TX (8t 8z)
 [Avantgarde]  {\caps } {\rm \it \bf \bi \tt } +TX (8t 8z)
 [Bookman]  {\caps } {\rm \it \bf \bi \tt } +TX (8t 8z)
 [Palatino]  {\caps } {\rm \it \bf \bi \tt } +TX (8t 8z)
 [New Century]  {\caps } {\rm \it \bf \bi \tt } +TX (8t 8z)
=== TeXGyre project, fonts derived from Adobe 35 ===
 [TG Termes]  {\caps } {\rm \it \bf \bi } +TX (8t 8z U)
 [TG Heros]  {\caps \cond } {\rm \it \bf \bi } +TX (8t 8z U)
 [TG Adventor]  {\caps } {\rm \it \bf \bi } +TX (8t 8z U)
 [TG Bonum]  {\caps } {\rm \it \bf \bi } +TX (8t 8z U)
 [TG Pagella]  {\caps } {\rm \it \bf \bi } +TX (8t 8z U)
 [TG Schola]  {\caps } {\rm \it \bf \bi } +TX (8t 8z U)
 [TG Cursor]  {\caps } {\rm \it \bf \bi } +TX (8t 8z U)
=== Polish fonts ===
 [Antykwa Torunska]  {\caps \cond \wlight } {\rm \it \bf \bi } +TX (8t 8z)
 [Antykwa Poltawskiego]  {\caps \wlight } {\rm \it \bf \bi } +TX (8t 8z U)
=== Miscelaneous ===
 [Charter]  {} {\rm \it \bf \bi } +TX (8t 8z)
 [Arev Sans]  {} {\rm \it \bf \bi } +TX (8t)
 [Bera]  {\sans } {\rm \it \bf \bi } +TX (8t)
 -- [Linux Libertine] (U sU) -- unavailable in 8t enc.
 [KP fonts]  {\caps \bcaps \slant \sans \ttset \wlight \bext \noflig \oldn \olds
 \oldsv } {\rm \it \bf \bi } ... 22 modifiers in total +KP (8t 7t)
 [Catalog]  {} {} print catalogue ()
```

See OPmac documentation [5] for more information about this. User can create own font-files and register them to the \fontfam listing.

1.3 Font modifiers

You can use "modifiers" of the basic variants of family \rm, \bf, \it, and \bi. If modifiers are supported then they are listed in the \fontfam listing. For example TG Heros family supports two modifiers \cond and \caps which means "condensed" and "caps&small caps". The modifiers can be independently combined but they must be immediately followed by \rm, \bf, \it, \bi, \one or \fam control sequences.

If the modifiers are followed by \rm, \bf, \it, or \bi then a modification of given basics family variant is selected as a single font. If they are followed by \one then a modification of currently selected variant is used. If they are followed by \fam then it works like \one but moreover, the basic font selectors \tenrm, \tenbf, \tenit and \tenbi are reloaded using given modifiers, so all family selected by macros \rm, \bf, \it and \bi works with given modification. Example:

```
\input cs-heros
{\cond\rm        ... Normal condensed.}
{\caps\cond\it  ... Caps \& small-caps plus condensed italics.}
{\caps\fam       ... Caps \& small-caps, now all basic macros
                    \rm, \bf, \it, \bi keeps this modification.}
```

All font selectors and their modifiers do setting locally inside TeX group. The modifiers keep their data in the TeX memory (locally) and they can be applied afterwards:

```
{\cond\fam \rm Here is {\it condensed} font family.
 \caps\fam \rm Here is {\it Caps \& small-caps} family which is {\it condensed}.}
```

This means that `\modifier\something` keeps previously selected modifications and only adds a new one.

You can combine fonts from more families. The main principle says: load the main family last. You can use `\ffletfont\newselector = {mod+var}{size}` for keeping font selectors from previous loading. Example:

```
\input cs-heros
\ffletfont \titlefont = {\cond\bf}{at14pt} % Heros condensed for titles
\input cs-termes % Termes at 10 pt for normal text
```

If you are using XeTeX or LuaTeX then the U (unicode) encoding is used and OTF fonts are loaded. You can use `\useff{text}` in such case. This works like another font modifier and does modification of font-features. Use `otfinfo -f file.otf` to inspect the font features of used font. Example:

```
\useff{+onum;+salt}\bf  ... use Bold variant with oldstyle digits and
                            stylistic alternatives
\useff{+onum;+salt}\fam ... use given features for whole family.
```

1.4 Font encodings

The list printed by `\fontfam` macro shows (in parentheses) what encodings are supported by each font family. The used abbreviations means:

```
8t ... 8bit T1 encoding stated in Cork
8z ... 8bit XL2 encoding derived from ISO-8859-2, used in Czech and Slovak TeX
7t ... 7bit encoding declared by Knuth in cmr10 font
U  ... Unicode, this means that fonts are loaded in OTF format
```

$\mathcal{CS}$plain format with pdfTeX starts in 8z encoding by default but this can be changed to 8t encoding using `\input t1code`. If XeTeX or LuaTeX is used then U encoding is assumed. If encoding is not set by rules mentioned right before (i.e. non-$\mathcal{CS}$plain with pdfTeX) then 8t is set. The default setting can be changed by `\def\fotenc{enc}` before `\input font-file`. The switching to more various encodings inside document isn't supported. User can prepare such simply macros if it is needed.

The 7c encoding (companion encoding to 8t with more additional characters) is provided by `exchars.tex` macro file from $\mathcal{CS}$plain. See this macro file for more details. The macro file `exchars.tex` is used in `kp-fonts.tex`, thus all additional characters are simply accessible. For example user write `\euro` and it prints € when *kpfonts* are selected (or when 8z encoding is used because 8z encoding includes € directly).

$\mathcal{CS}$plain format with pdfTeX provides UTF-8 input encoding unsing encTeX extension of pdfTeX. This is documented in [6]. So, user can use accented letters and more characters directly. User can write € and it prints € in $\mathcal{CS}$plain when *kpfonts* are selected. Non-$\mathcal{CS}$plain formats with pdfTeX don't provide UTF-8 input unless user creates something for this. But languages with ISO-8859-1 characters set (Spanish, French, German, …) can use their accented letters encoded in ISO-8859-1 because this encoding is a subset of 8t font encoding. XeTeX and LuaTeX provides UTF-8 input as native input.

1.5 Math fonts

The `\fontfam` macro lists the abbreviation of math fonts collection used together with selected text font family. See the letters after "plus sign" in the output of `\fontfam[?]` in the section 1.2.

```
AMS ... AMSTeX font collection: Computer Modern plus a set of others
TX .... TX fonts, they are superset of AMS and designed for Times family
KP .... KP math fonts collection, designed for kpfonts
```

Note that most of text font families are combined with TX fonts by default. The italic and roman variants from selected text font family is used for variables and for math texts like sin, lim, max. Other symbols are used from TX fonts collection. If you are using Unicoded TeX engine (XeTeX or LuaTeX) then you can load Unicode Math font, but this is not provided as default. See the `uni-math.tex` file for more information.

Two math font macro-selectors are provided: `\normalmath` and `\boldmath`. If a math modifiers are available (this is the case of KP math collection fonts only) then these math modifiers can be used

before \normalmath or \boldmath. These selectors sets the fonts for whole formula inside math mode. On the other hand, you can use individual math switchers which selects a math alphabet inside math mode: \cal for simple calliraphic, \script for more calligraphic, \frak for fraktur and \bbchar for double strokes. Of course, \rm and \it select normal or italics. But \bf and \bi select *sans serif* bold and bold-italic, because it is more conventional to use sans serifed bold in math formulas (for vectors or matrices, for example).

$\mathcal{C}_S$plain package inclues macros for math font collections in the following files

```
ams-math.tex ... AMS fonts
tx-math.tex  ... TX fonts
ntx-math.tex ... NTX fonts
kp-math.tex  ... KP fonts
uni-math.tex ... Unicode Math font declared in the \unimathfont macro
```

These files provide simple loading of math fonts collections including scaling of the whole collection to desired sizes. Basic features are documented in these files directly.

A different math font collection can be combined with text font family than default. It can be done by \let\loadmathfonts=\relax before \input font-file. This suppresses the loading of math font family. Then \input foo-math can be used directly.

You can copy and rename a foo-math.tex file and you can do various modifications or set a complete new math fonts collection.

2 The *kpfonts* manual for plain TEX

Use \input kp-fonts. There are twelve modifiers of text fonts of *kpfonts* family:

```
\caps ..... Caps & small caps
\bcaps .... Bigger small-caps
\slant .... Slanted
\sans ..... Sans serif
\ttset .... TypeWriter set
\wlight ... Weight Light
\bext ..... Bold extended
\noflig ... no f ligatures
\oldn ..... Old style numbers
\olds ..... Old style all
\oldsv .... Very old style
\kpreset .. Returns all modifications to default values
```

And there are next ten math modifiers of KP math fonts collections:

```
\lightmath .... Light version of math
\widermath .... More amount of spaces between characters
\bfnmath ...... Normal \bf in math (bf sans is default)
\sansmath ..... Sans serif math
\uprightmath .. Capital letters are upright
\bbcharss ..... Blackboard characters sans serif
\greekup ...... Lowercase Greek upright
\partialup .... Upright partial derivations symbol
\narowiints ... Multiplied integrals narrower
\kpmathreset .. Returns to the default setting
```

2.1 Text fonts

The \fontfam[Catalog] prints basic modifications of *kpfonts*:

[KP fonts]
\rm ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽČ 0123456789
\bf **ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽČ 0123456789**
\it *ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽČ 0123456789*

```
\bi       ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\caps\rm  ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\caps\bf  ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\caps\it  ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\caps\bi  ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\bcaps\rm ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\bcaps\bf ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\bcaps\it ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\bcaps\bi ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\slant\rm ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\slant\bf ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\slant\it ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\slant\bi ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\rm  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\bf  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\it  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\bi  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\ttset\rm ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\ttset\bf ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\ttset\it ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\ttset\bi ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\wlight\rm ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\wlight\bf ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\wlight\it ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\wlight\bi ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\bext\rm  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\bext\bf  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\bext\it  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\bext\bi  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\noflig\rm ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\noflig\bf ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\noflig\it ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\noflig\bi ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\oldn\rm  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\oldn\bf  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\oldn\it  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\oldn\bi  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\olds\rm  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\olds\bf  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\olds\it  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\olds\bi  ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\oldsv\rm ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\oldsv\bf ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\oldsv\it ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\oldsv\bi ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
```

Of course, you can combine more modifiers independently if this gives a sense:

```
\sans\caps\rm      ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\caps\bf      ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\caps\it      ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\caps\bi      ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\caps\oldn\rm ABCDabcd QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\caps\oldn\bf ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\caps\oldn\it ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\sans\caps\oldn\bi ABCDABCD QSTY FI FL ÁÉÍÓÚÜŮ řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
\ttset\oldsv\rm    ABCDabcd Qsty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽĆ 0123456789
```

```
\ttset\oldsv\bf ABCDabcd Qﬁty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽČ 0123456789
\ttset\oldsv\it ABCDabcd Qﬁty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽČ 0123456789
\ttset\oldsv\bi ABCDabcd Qﬁty fi fl áéíóúüů řžč ÁÉÍÓÚÜŮ ŘŽČ 0123456789
```

If the combination of modifiers gives no sense or it is not implemented in *kpfonts* (for example the combination \sans\wlight isn't implemented) then font is not changed and the warning in the form

```
FONT warning: KPfonts - subfam="ss" wlight="l" bcaps="", noflig="", old="", bex
t="" of variant="mn" in encoding="8t" (jkpsslmn8t) unavailable
```

is printed on the terminal and in the log file.

Because there are "weight light" variants, users can use an extended set of macro selectors: \lr, \rm, \mr, \bf and \li, \it, \mi, \bi, which are defined by:

```
\def\lr{\wlight\rm} \def\li{\wlight\it} \def\mr{\wlight\bf} \def\mi{\wlight\bi}
```

2.2 Quiz

The "quiz" published in [7] can be done in plain TeX too:

1. A.Queer ſayſ: make 29 active characterſ iſ definitely naſty!
2. A.QUEER says: make 29 **active** characters is definitely nasty!
3. *A.Queer says: make 29 active characters is definitely naſty!*
4. A.Queer *says: make 29 active characters is definitely nasty!*
5. A.Queer says: make 29 active characters is definitely naſty!
6. A.Queer says: make 29 **active** characters is definitely nasty!
7. A.Queer says: make 29 **active** characters is definitely nasty!
8. A.Queer says: make 29 **active** characters is definitely nasty!
9. A.Queer *says: make 29 active characters is definitely nasty!*
10. *A.QUEER says: make 29 active characters is definitely nasty!*

How this "quiz" is prepared (using \begitems from OPmac):

```
\def\quiz#1{{#1\one A.Queer} says:
   make 29 {\bem active} characters is definitely nasty!}
% \bem: \rm -> \bf,  \it -> \bi
\def\bem{\expandafter\ifx\the\font\tenrm \tenbf
   \else \expandafter\ifx\the\font\tenit \tenbi \fi\fi}

\begitems \style n
* {\wlight\oldsv\fam\it \quiz{\rm\caps\olds}}
* {\oldn\fam \quiz\bcaps}
* {\olds\fam \it \quiz\caps}
* {\wlight\noflig\fam \it \quiz{\rm\caps}}
* {\wlight\olds\fam \quiz\caps}
* {\quiz\caps}
* {\noflig\fam \quiz\caps}
* {\wlight\fam \quiz\caps}
* {\it \quiz{\rm\bcaps}}
* {\wlight\noflig\fam \it \quiz\bcaps}
\enditems
```

2.3 Companion set of fonts

The characters from 7c encoding is accessible via control sequences listed in exchars.tex file. It means they begin by \ex prefix. Only \euro can be used without this prefix:

```
{The price is 29~\euro. \bf The price is 29~\euro.
 \it The price is 29~\euro. \ttset\one The price is 29~\euro.}
```

Gives: The price is 29 €. **The price is 29 €.** *The price is 29 €.* The price is 29 €.

2.4 Math fonts

The math modifiers must be followed by `\normalmath` or `\boldmath` collection selectors. These modifiers and selectors does nothing in text fonts and vice versa: text modifiers does nothing in math typesetting.

As an example we give the same sample from the article [7]. Fist, `\normalmath` without modifiers:

First some large operators both in text: $\iiint_Q f(x,y,z)\,dx\,dy\,dz$ and $\prod_{\gamma\in\Gamma_{\hat{C}}}\partial(\widetilde{X}_\gamma)$; and also on display:

$$\iiiint_Q f(w,x,y,z)\,dw\,dx\,dy\,dz \leq \oint_{\partial Q} f'\left(\max\left\{\frac{\|w\|}{|w^2+x^2|};\frac{\|z\|}{|y^2+x^2|}{}'\frac{\|w\oplus z\|}{\|x\oplus y\|}\right\}\right)$$

$$\gtrapprox \biguplus_{\mathbb{Q}\in\bar{\mathbb{Q}}}\left[f^*\left(\frac{\int\mathbb{Q}(t)\rfloor}{\sqrt{1-t^2}}\right)\right]_{t=\alpha}^{t=\theta} \tag{1}$$

For x in the open interval $]-1[$ the infinite sum in Equation (2) is convergent; however, this does not hold throughout the closed interval $[-1,1]$.

$$(1-x)^{-k} = 1 + \sum_{j=1}^{\infty}(-1)^j\begin{Bmatrix}k\\j\end{Bmatrix}x^j \quad \text{for } k\in\mathbb{N}; k\neq 0. \tag{2}$$

Now, we declare `\lightmath\narrowiints\normalmath` and `\wlight\fam`:

First some large operators both in text: $\iiint_Q f(x,y,z)\,dx\,dy\,dz$ and $\prod_{\gamma\in\Gamma_{\hat{C}}}\partial(\widetilde{X}_\gamma)$; and also on display:

$$\iiiint_Q f(w,x,y,z)\,dw\,dx\,dy\,dz \leq \oint_{\partial Q} f'\left(\max\left\{\frac{\|w\|}{|w^2+x^2|};\frac{\|z\|}{|y^2+x^2|}{}'\frac{\|w\oplus z\|}{\|x\oplus y\|}\right\}\right)$$

$$\gtrapprox \biguplus_{\mathbb{Q}\in\bar{\mathbb{Q}}}\left[f^*\left(\frac{\int\mathbb{Q}(t)\rfloor}{\sqrt{1-t^2}}\right)\right]_{t=\alpha}^{t=\theta} \tag{1}$$

For x in the open interval $]-1[$ the infinite sum in Equation (2) is convergent; however, this does not hold throughout the closed interval $[-1,1]$.

$$(1-x)^{-k} = 1 + \sum_{j=1}^{\infty}(-1)^j\begin{Bmatrix}k\\j\end{Bmatrix}x^j \quad \text{for } k\in\mathbb{N}; k\neq 0. \tag{2}$$

Third example declares `\greekup\normalmath`:

First some large operators both in text: $\iiint_Q f(x,y,z)\,dx\,dy\,dz$ and $\prod_{\gamma\in\Gamma_{\hat{C}}}\partial(\widetilde{X}_\gamma)$; and also on display:

$$\iiiint_Q f(w,x,y,z)\,dw\,dx\,dy\,dz \leq \oint_{\partial Q} f'\left(\max\left\{\frac{\|w\|}{|w^2+x^2|};\frac{\|z\|}{|y^2+x^2|}{}'\frac{\|w\oplus z\|}{\|x\oplus y\|}\right\}\right)$$

$$\gtrapprox \biguplus_{\mathbb{Q}\in\bar{\mathbb{Q}}}\left[f^*\left(\frac{\int\mathbb{Q}(t)\rfloor}{\sqrt{1-t^2}}\right)\right]_{t=\alpha}^{t=\theta} \tag{1}$$

For x in the open interval $]-1[$ the infinite sum in Equation (2) is convergent; however, this does not hold throughout the closed interval $[-1,1]$.

$$(1-x)^{-k} = 1 + \sum_{j=1}^{\infty}(-1)^j\begin{Bmatrix}k\\j\end{Bmatrix}x^j \quad \text{for } k\in\mathbb{N}; k\neq 0. \tag{2}$$

Next sample si lighter by `\lighmath\partialup\normalmath` and `\wlight\fam`:

First some large operators both in text: $\iiint\limits_{\mathcal{Q}} f(x,y,z)\,dx\,dy\,dz$ and $\prod_{\gamma\in\Gamma_{\bar{C}}} \partial(\widetilde{X}_\gamma)$; and also on display:

$$\iiiint_Q f(w,x,y,z)\,dw\,dx\,dy\,dz \le \oint_{\partial Q} f'\left(\max\left\{\frac{\|w\|}{|w^2+x^2|};\frac{\|z\|}{|y^2+x^2|}\,'\frac{\|w\oplus z\|}{\|x\oplus y\|}\right\}\right)$$

$$\lesssim \biguplus_{\mathbb{Q}\Subset\bar{Q}}\left[f^*\left(\frac{\int\mathbb{Q}(t)\rfloor}{\sqrt{1-t^2}}\right)\right]_{t=\alpha}^{t=\theta} \tag{1}$$

For x in the open interval $]{-}1[$ the infinite sum in Equation (2) is convergent; however, this does not hold throughout the closed interval $[-1,1]$.

$$(1-x)^{-k} = 1 + \sum_{j=1}^{\infty}(-1)^j\begin{Bmatrix}k\\j\end{Bmatrix}x^j \quad \text{for } k\in\mathbb{N}; k\neq 0. \tag{2}$$

The example with sans serif math can be achieved by `\sansmath\normalmath`:

First some large operators both in text: $\iiint\limits_{\mathcal{Q}} f(x,y,z)\,dx\,dy\,dz$ and $\prod_{\gamma\in\Gamma_{\bar{C}}} \partial(\widetilde{X}_\gamma)$; and also on display:

$$\iiiint_Q f(w,x,y,z)\,dw\,dx\,dy\,dz \le \oint_{\partial Q} f'\left(\max\left\{\frac{\|w\|}{|w^2+x^2|};\frac{\|z\|}{|y^2+x^2|}\,'\frac{\|w\oplus z\|}{\|x\oplus y\|}\right\}\right)$$

$$\lesssim \biguplus_{\mathbb{Q}\Subset\bar{Q}}\left[f^*\left(\frac{\int\mathbb{Q}(t)\rfloor}{\sqrt{1-t^2}}\right)\right]_{t=\alpha}^{t=\theta} \tag{1}$$

For x in the open interval $]{-}1[$ the infinite sum in Equation (2) is convergent; however, this does not hold throughout the closed interval $[-1,1]$.

$$(1-x)^{-k} = 1 + \sum_{j=1}^{\infty}(-1)^j\begin{Bmatrix}k\\j\end{Bmatrix}x^j \quad \text{for } k\in\mathbb{N}; k\neq 0. \tag{2}$$

The following sample uses `\widermath\uprightmath\normalmath`:

First some large operators both in text: $\iiint\limits_{\mathcal{Q}} f(x,y,z)\,dx\,dy\,dz$ and $\prod_{\gamma\in\Gamma_{\bar{C}}} \partial(\widetilde{X}_\gamma)$; and also on display:

$$\iiiint_Q f(w,x,y,z)\,dw\,dx\,dy\,dz \le \oint_{\partial Q} f'\left(\max\left\{\frac{\|w\|}{|w^2+x^2|};\frac{\|z\|}{|y^2+x^2|}\,'\frac{\|w\oplus z\|}{\|x\oplus y\|}\right\}\right)$$

$$\lesssim \biguplus_{\mathbb{Q}\Subset\bar{Q}}\left[f^*\left(\frac{\int\mathbb{Q}(t)\rfloor}{\sqrt{1-t^2}}\right)\right]_{t=\alpha}^{t=\theta} \tag{1}$$

For x in the open interval $]{-}1[$ the infinite sum in Equation (2) is convergent; however, this does not hold throughout the closed interval $[-1,1]$.

$$(1-x)^{-k} = 1 + \sum_{j=1}^{\infty}(-1)^j\begin{Bmatrix}k\\j\end{Bmatrix}x^j \quad \text{for } k\in\mathbb{N}; k\neq 0. \tag{2}$$

The last example combines sans serif with narrow multiple integrals and upright caps and Greek by \sansmath\uprightmath\narrowiints\greekup\partialup\normalmath with \sans\fam:

First some large operators both in text: $\iiint_{\mathcal{Q}} f(x, y, z)\, dx\, dy\, dz$ and $\prod_{\gamma \in \Gamma_{\hat{c}}} \partial(\widetilde{X}_\gamma)$; and also on display:

$$
\iiint_Q f(w, x, y, z)\, dw\, dx\, dy\, dz \leq \oint_{\partial Q} f' \left(\max \left\{ \frac{\|w\|}{|w^2 + x^2|} ; \frac{\|z\|}{|y^2 + x^2|} \, ' \frac{\|w \oplus z\|}{\|x \oplus y\|} \right\} \right)
$$

$$
\gtrapprox \biguplus_{\mathbb{Q} \in \bar{Q}} \left[f^* \left(\frac{\int \mathbb{Q}(t) \big\downarrow}{\sqrt{1 - t^2}} \right) \right]_{t=\alpha}^{t=\theta} \tag{1}
$$

For x in the open interval $]-1[$ the infinite sum in Equation (2) is convergent; however, this does not hold throughout the closed interval $[-1, 1]$.

$$
(1 - x)^{-k} = 1 + \sum_{j=1}^{\infty} (-1)^j \begin{Bmatrix} k \\ j \end{Bmatrix} x^j \quad \text{for } k \in \mathbb{N}; k \neq 0. \tag{2}
$$

3   Notes for macro writers and developers of font-files

The font-files include `ff-mac.tex` from $\mathcal{CS}$plain package where basic macros for declaration of independent font modifiers are prepared. Macro programmers can get inspiration in the `cs-heros.tex` font-file where two independent font modifiers are declared (\caps and \cond) and where the macros from the `ff-mac.tex` are documented in detail.

If you are using Unicode fonts in XeTeX or LuaTeX then you can get more inspiration in the file `cs-liberation.tex`. Use `"..."` notation for font names (i. e. no `{...}`) because it works for both engines: XeTeX and LuaTeX.

Note, that all features of *kpfonts* are implemented in two files `kp-fonts.tex` and `kp-math.tex` with 320 lines of code in total. On the other hand, the *kpfonts* macro support for LaTeX is implemented in the `kpfonts.sty` with 1680 lines of code plus next 195 `*.fd` files, which gives 15 thousands lines in total.

4   References

[1]   http://www.ctan.org/pkg/kpfonts
[2]   http://www.ctan.org/pkg/csplain
[3]   http://petr.olsak.net/ftp/olsak/bulletin/tb106olsak-opmac.pdf
[4]   http://petr.olsak.net/opmac-e.html
[5]   http://petr.olsak.net/ftp/olsak/opmac/opmac-u-en.pdf
[6]   http://petr.olsak.net/csplain-e.html
[7]   http://www.tug.org/TUGboat/tb31-3/tb99caignaert.pdf