The **csconcr** style option

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This document has been produced as a technical report at the Institute of Computer Science of Masaryk University Brno, Czech Republic. It is freely available (by anonymous ftp) from `ftp.muni.cz` in directory `/pub/tex/local/cstug/sojka/csconcr`.

1 Introduction

This style option sets up some font shape definition and one math version to allow setting documents similar to the book “Concrete math”.

The current version of this file should serve only as a model. It isn't finished and will eventually change but I don't like to do work which is already done elsewhere. Therefore this has to wait until I get hold of a copy of Don Knuth macros for typesetting his book *Concrete Mathematics*.

`csconcr.sty` (version v1.0hcsb, 95/01/05) was derived from `concrete.sty` (version 1.0a). We use adapted and extended concrete fonts for czech/slovak language. This style file has been tested with adapted for the needs of typesetting of Czech bulletin “Zpravodaj” for Institute of Computer Science, Masaryk University Brno in the Czech Republic.

2 The Implementation

We start by writing to the VDU and the transcript file.

```
⟨*style⟩
\typeout{Style Option: ‘csconcr’
  \fileversion\space <\filedate> (FMi and RmS and PSo)}
\typeout{English Documentation
  \@spaces\@spaces\space <\docdate> (FMi and RmS and PSo)}
```

But we should also check if the new font selection is actually in force otherwise the user will get a lot of uninstructive error messages later on.

```
\@ifundefined{selectfont}
    {\@latexerr{‘csconcr’ style option could only be used
                 with the new font selection scheme}\@eha
     \endinput}{}
```

Now we define the font shapes for the concrete roman font family designed by Don Knuth. First the normal shape in medium weight and width (others aren't available anyway). We assume that for LaTeX use at least the standard magnifications are available.

```
\new@fontshape{cscr}{m}{n}{%
   <5>cscr5%
   <6>cscr6%
```

```
    <7>cscr7%
    <8>cscr8%
    <9>cscr9%
    <10>cscr10%
    <11>cscr10 at10.95pt%
    <12>cscr10 at12pt%
    <14>cscr10 at14.4pt%
    <17>cscr10 at17.28pt%
    <20>cscr10 at20.74pt%
    <25>cscr10 at24.88pt}{}
```

The **bold** shapes are substituting from computer modern family, but one may try to use `cscbx10.mf` font instead.

```
\subst@fontshape{cscr}{bx}{n}{csr}{bx}{n}
\subst@fontshape{cscr}{bx}{it}{csr}{bx}{it}
\subst@fontshape{cscr}{bx}{sl}{csr}{bx}{sl}
```

The *italic* shape in concrete roman is only provided for the 10pt size. Again we assume that at least for 11 and 12 pt magnified fonts are available. For the smaller or larger sizes we substitute the normal shape.

```
\new@fontshape{cscr}{m}{it}{%
    <5>1cscr5%
    <6>1cscr6%
    <7>1cscr7%
    <8>1cscr8%
    <9>1cscr9%
    <10>cscti10%
    <11>cscti10 at10.95pt%
    <12>cscti10 at12pt%
    <14>1cscr10 at14.4pt%
    <17>1cscr10 at17.28pt%
    <20>1cscr10 at20.74pt%
    <25>1cscr10 at24.88pt}{}
```

Also A CAPS AND SMALL CAPS shape for 10pt is provided.

```
\new@fontshape{cscr}{m}{sc}{%
    <5>1cscr5%
    <6>1cscr6%
    <7>1cscr7%
    <8>1cscr8%
    <9>1cscr9%
    <10>csccsc10%
    <11>csccsc10 at10.95pt%
    <12>csccsc10 at12pt%
    <14>1cscr10 at14.4pt%
    <17>1cscr10 at17.28pt%
    <20>1cscr10 at20.74pt%
    <25>1cscr10 at24.88pt}{}
```

There is also a slanted shape in 9pt with condensed width and medium weight which is used for"graffiti" throughout the book which will be defined below. Again we provide substitutes for other sizes. Since this font does not exist in ten point size it would be nearly impossible to use it via the standard LaTeX mechanism with commands like `\small` etc. (who knows to what pointsize `\small` belongs to? Therefore we add later on a macro to address this font directly.

```
\new@fontshape{cscr}{c}{sl}{%
    <5>1cscr5%
    <6>1cscr6%
```

```
    <7>lcscr7%
    <8>lcscr8%
    <9>cscslc9%
    <10>lcscr10%
    <11>lcscr10 at10.95pt%
    <12>lcscr10 at12pt%
    <14>lcscr10 at14.4pt%
    <17>lcscr10 at17.28pt%
    <20>lcscr10 at20.74pt%
    <25>lcscr10 at24.88pt}{}
```

```
\extra@def{ccr}{}{}
```

From the Euler fonts designed by Hermann Zapf we need the families ‘euler cursive’. (Others will follow in the final version of this option.)

```
\new@fontshape{eur}{m}{n}{%
    <5>eurm5%
    <6>eurm6%
    <7>eurm7%
    <8>eurm8%
    <9>eurm9%
    <10>eurm10%
    <11>eurm10 at10.95pt%
    <12>eurm10 at12pt%
    <14>eurm10 at14.4pt%
    <17>eurm10 at17.28pt%
    <20>eurm10 at20.74pt%
    <25>eurm10 at24.88pt}{}
```

We will have to set a \skewchar but I don’t know the right value.

```
\extra@def{eur}{\skewchar#1'177}{}
```

Don Knuth re-designed some of the math extension symbols to blend better with the euler fonts. So we have a font called ‘Euler compatible extension font’ available in 7 to 10pt.

```
\new@fontshape{euex}{m}{n}{%
    <5>leuex7%
    <6>leuex7%
    <7>euex7%
    <8>euex8%
    <9>euex9%
    <10>euex10%
    <11>leuex10%
    <12>leuex10%
    <14>leuex10%
    <17>leuex10%
    <20>leuex10%
    <25>leuex10}{}
```

```
\extra@def{euex}{}{}
```

\graffiti
\pgraffiti

As I remarked above

I don’t think that it is really necessary to make a robust version but …

```
\def\graffiti{\protect\pgraffiti}
```

Note that this command has no arguments, it simply calls or protects (depending on the current meaning of \protect) the \pgraffiti macro.

This macro now sets everything necessary to switch to the ccslc font. It therefore serves as a good example how to access special fonts for special applications with the new font selection scheme.

```
\def\pgraffiti{\fontfamily{cscr}\fontseries{c}%
                 \fontshape{sl}\fontsize{9}{10pt}\selectfont}
```

`\mv@euler` Now we define the basic *math groups* for the new version, i.e. the groups 0 to 3.

```
\new@mathversion\mv@euler
\define@mathgroup\mv@euler{0}
                  {cscr}{m}{n}
\define@mathgroup\mv@euler{1}
                  {eur}{m}{n}
\define@mathgroup\mv@euler{2}
                  {cmsy}{m}{n}
```

`\euex@group` We also add a special math group to the euler version which contains the redesigned math symbols. Since we don't assume that this version has to live in coexistance with the 'normal' or 'bold' version we don't add this group to the other versions.

```
\new@mathgroup\euex@group
\define@mathgroup\mv@euler\euex@group
                  {euex}{m}{n}
```

To set up the math version properly we have to reset some `\mathcode`s. We have to take, for example, digits in math from the math group number one, i.e. from the euler cursive font. If we do this globally switching back to, let's say, LaTeXs normal version will produces an undesired effect: we will then get oldstyle numerals in math.

We will leave this problem open at the moment until there is more experience with this new font selection scheme. After all, it does not seem a very good idea to use such incompatible math versions together in one document.

So here we are, re-arranging some of the internal tables:

```
\mathcode`\0="7130
\mathcode`\1="7131
\mathcode`\2="7132
\mathcode`\3="7133
\mathcode`\4="7134
\mathcode`\5="7135
\mathcode`\6="7136
\mathcode`\7="7137
\mathcode`\8="7138
\mathcode`\9="7139
```

And here are some example for using the symbols from the special extension font. We use `\hexnumber@` to get the unknown assignment to `\euex@group` as a hexadecimal number into the macro `\@tempa`.

```
\edef\@tempa{\hexnumber@\euex@group}
\mathchardef\intop="1\@tempa 52
\mathchardef\ointop="1\@tempa 48
\mathchardef\sum="1\@tempa 50
\mathchardef\prod="1\@tempa 51
```

`\@makefnmark` Since numbers for footnotes are text numbers and not math formulas we prefer shapes comming from Concrete roman (like 12345) instead of 12345. So we have to change the footnote mark generation to avoid using math mode.

```
\def\@makefnmark{\raise 1ex\hbox{\scriptsize\@thefnmark}}
```

```
\mathversion{euler}
⟨/style⟩
```

3 The documentation driver file

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.

```
⟨+driver⟩\documentstyle[doc,csconcr]{article}
⟨+driver⟩
⟨+driver⟩% dimensions from ltugboat.sty:
⟨+driver⟩
⟨+driver⟩\setlength\textwidth{31pc}
⟨+driver⟩\setlength\textheight{54pc}
⟨+driver⟩\setlength{\parindent}{0pt}
⟨+driver⟩\setlength{\parskip}{2pt plus 1pt minus 1pt}
⟨+driver⟩\setlength{\oddsidemargin}{8pc}
⟨+driver⟩\setlength{\marginparwidth}{8pc}
⟨+driver⟩\setlength{\topmargin}{-2.5pc}
⟨+driver⟩\setlength{\headsep}{20pt}
⟨+driver⟩\setlength{\columnsep}{1.5pc}
⟨+driver⟩\setlength{\columnwidth}{18.75pc}
⟨+driver⟩
⟨+driver⟩\EnableCrossrefs
⟨+driver⟩%\DisableCrossrefs % Say \DisableCrossrefs if index is ready
⟨+driver⟩
⟨+driver⟩\RecordChanges     % Gather update information
⟨+driver⟩
⟨+driver⟩\CodelineIndex     % Index code by line number
⟨+driver⟩
⟨+driver⟩%\OnlyDescription  % comment out for implementation details
⟨+driver⟩%\OldMakeindex     % use if your MakeIndex is pre-v2.9
⟨+driver⟩\begin{document}
⟨+driver⟩   \DocInput{csconcr.doc}
⟨+driver⟩\end{document}
```

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