Using Greek Fonts with LATEX

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Abstract

In this document I hope to show that typesetting Greek in LATEX using the lgreek package (and the gr fonts) can be as easy as typesetting English text, and leads to equally good results. This is meant to be a tutorial, not an exhaustive discussion; some TeXnical remarks that should be useful after the reader has acquired some familiarity with the fonts are printed in fine print.

1 The Alphabet

In order to typeset Greek text, you need to go into "Greek mode." This is achieved by typing \begin{greek} anywhere in your document; Greek mode will remain in effect until you type a matching \end{greek}. While in Greek mode, the letters 'a' to 'z' and 'A' to 'Z' come out as Greek letters, according to the following code:

There is no digamma yet. The same character 's' will print as ' σ ' or ' ς ', depending on its position in a word.

The system does this by accessing a ligature of 's' with any other letter that follows it. If, for some reason, you want to print an initial/medial sigma by itself (as in the table above), or at the end of a word, you should type 'c'.

Try to typeset some simple text now. Create a file containing the following lines:

```
\documentclass{article}
\usepackage{lgreek}
\begin{document}
This is English text.
\begin{greek}
This is Greek text.
\end{greek}
\end{document}
```

When you TEX this file, you get the following gibberish:

```
This is English text. Τηις ις Γρεεχ τεξτ.
```

If you give the delims option for the package then the character \$ can be used in place of both \begin{greek} and \end{greek}, as eg

```
This is English text. $This is Greek text.$
```

The control sequences $\langle \ldots \rangle$ are still available for in-text math.

2 Accents and Breathings

To get an acute, grave or circumflex accent over a vowel, type ', ' or ~, respectively, before the vowel. To get a rough or smooth breathing, type < or > before the vowel (or rho) and any accent that it may have. To get an iota subscript, type | after the vowel. A diaeresis is represented by ", and if accompanied by an accent it can come before or after the accent.

For example, >en >arq\~h| >\~hn <o l'ogos gives ἐν ἀρχῆ ῆν ὁ λόγος. Neat, ain't it?

Accents and breathings, too, are typeset by means of ligatures: a vowel with a breathing, an accent and iota subscript, for example, is realized as a four-character ligature. The only exception is when a breathing is followed by a grave accent, in which case the breathing + accent combination is typeset as a TeX \accent over the vowel. This means that words containing such combinations cannot be hyphenated in (standard) TeX; but this is not a problem because, with the exception of very rare cases of crasis, all such words are monosyllables.

3 Punctuation

Here's the table of correspondences for punctuation:

```
. , · : ! ; ' « » . , ; : ! ? '' (( ))
```

The last three entries represent the apostrophe and quotations marks. The other available non-letters are the ten digits, parentheses, brackets, hyphen, emand en-dashes, slash, percent sign, asterisk, plus and equal signs. All of these are accessible in the usual way. In a future release there will be tick marks for numbers ($\alpha' = 1$, $\alpha = 1000$).

4 Hyphenation

A hyphenation table for both modern and ancient Greek is currently being debugged. For now one can use the usual (English) hyphenation table, which gives the right results about 90% of the time (amazing, isn't it?). Be sure to proofread your text carefully, unless you've turned hyphenation off.

5 Interaction with other macros

While in Greek mode you can do just about everything that you can outside: go into math mode, create boxes, alignments, and so on. The file <code>greekmacros.tex</code> sets things up so that in Greek mode the control sequences <code>\tt</code> and <code>\bf</code> switch to a typewriter and a bold Greek font, respectively: thus <code>\texttt{s''>agap\~w}</code> gives $\sigma' \dot{\alpha} \gamma \alpha \pi \tilde{\omega}$. (Try it.) On the other hand, there are no "italic" or slanted Greek fonts, so <code>\it</code> and <code>\sl</code> will give you the same fonts as outside Greek mode. The various constructions under LATEX for increasing or decreasing point sizes don't work yet; they will in a future release.

The characters that form diacritics (<, >, ', ', \~, " and |) are treated differently depending on whether or not you're in Greek mode. More exactly, under plain TEX these characters (with the exception of \~) have a \catcode of 12: they print as themselves, and they cannot appear in control words. But in Greek mode ', ', \~, " and | are "letters", that is, they have a \catcode of 11, while < and > are active, with a \catcode of 13. This may be important even for beginners because it means that ', for example, can be taken as part of a control word. Thus the sequence

```
\begin{greek}
wm'ega\hfil'alfa
\end{greek}
```

will cause an error message about an undefined control sequence \hfil'alfa, instead of printing

as you might expect. (I hope classicists will forgive this use of the modern Greek one-accent system.) The solution, of course, is to remember to add a blank after the **\hfil**.

A more subtle problem arises when you use Greek text in macro arguments, if the arguments are scanned while you're outside Greek mode. This is because TEX assigns \catcodes to tokens as it first reads them, so when the argument is plugged into the body of the macro the characters above have the wrong \catcode. If the legendary Jonathan Horatio Quick were to write

```
\def\hellenize#1{\begin{greek}#1\end{greek}}
\hellenize{d'uo > 'h tre~is,}
```

he would be unpleasantly surprised by the following output:

```
δύο "η τρε ις,
```

which can be explained as follows: the \~, which should be a letter, is seen as an active character, and expands to a blank as in plain TEX; while the breathing, which should be active, is not, and in particular it doesn't do the right thing when next to the grave accent. Solutions to this problem require a bit of wizardry, and will not be discussed here; see, for example, Reinhard Wonneberger's article in the October, 1986 issue of TUGboat, especially pages 179–180.