Lucida OpenType fonts from TUG

TeX Users Group
http://tug.org/lucida

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1 Introduction

This document contains examples of the Lucida OpenType fonts available through TUG. They can be used with any OpenType-aware application, including the LuaTeX and X_eTeX extensions of TeX (but not pdfTeX).

A brief overview:

- Math fonts: Lucida Bright Math and Lucida Bright Math Demi, extended OpenType versions of the original Type 1 Lucida math fonts.

- Three text families (regular, italic, bold, bold italic) also coming from the original Type 1 distribution: Lucida Bright, Lucida Sans, and Lucida Sans Typewriter.

- Three specialized fonts from the original Type 1 distribution: Blackletter, Calligraphy, and Handwriting.

- Two additional monospaced font families (same four variants): Lucida Grande Mono DK and Lucida Console DK. These have O (oh), and Q glyphs modified to a somewhat squarish shape, and the 0 (zero) glyph open rather than slashed, as preferred by Don Knuth. As usual, Lucida Console has shorter capitals than Grande Mono, among other smaller changes. (If you don't have the DK fonts and want to remake this document as a test, you'll need to remove the references to them.)

Samples of all the fonts follow.

For information on the OpenType features in these fonts, see section 3. If you're using the Lucida OpenType fonts with TeX, examples and other details are in section 4.

For more information about the Lucida fonts available from TUG, and an order form, please see `http://tug.org/lucida`.

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2   Font samples

The basic text family is `LucidaBrightOT`, with the usual four variants—
regular, italic, bold, and bold italic, all with oldstyle figures; small caps are
available in the upright shapes:

For £45, almost anything can be found floating in fields. ¡THE
DAZED BROWN FOX QUICKLY GAVE 12345–67890 JUMPS! —
¿But aren't Kafka's Schloß and Æsop's Œuvres often naïve
vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?
Sphinx of black quartz, judge my vow. 0123456789.

`LucidaBrightOT`

*For £45, almost anything can be found floating in fields. ¡THE
DAZED BROWN FOX QUICKLY GAVE 12345–67890 JUMPS! —
¿But aren't Kafka's Schloß and Æsop's Œuvres often naïve
vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?
0123456789.*

`LucidaBrightOT-Italic`

**For £45, almost anything can be found floating in fields.
¡THE DAZED BROWN FOX QUICKLY GAVE 12345–67890
JUMPS! — ¿But aren't Kafka's Schloß and Æsop's Œuvres
often naïve vis-à-vis the dæmonic phœnix's official rôle in
fluffy soufflés? Sphinx of black quartz, judge my vow.
0123456789.**

`LucidaBrightOT-Demi`

***For £45, almost anything can be found floating in fields.
¡THE DAZED BROWN FOX QUICKLY GAVE 12345–67890
JUMPS! — ¿But aren't Kafka's Schloß and Æsop's Œuvres
often naïve vis-à-vis the dæmonic phœnix's official rôle in
fluffy soufflés? 0123456789.***

`LucidaBrightOT-DemiItalic`

2.1   Samples: Lucida Sans OT

The sans serif, `LucidaSansOT`, is available in the same four variants (no
small caps or oldstyle figures):

For £45, almost anything can be found floating in fields. ¡THE
DAZED BROWN FOX QUICKLY GAVE 12345–67890 JUMPS! —
¿But aren't Kafka's Schloß and Æsop's Œuvres often naïve
vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

`LucidaSansOT`

For £45, almost anything can be found floating in fields. ¡THE DAZED BROWN FOX QUICKLY GAVE 12345–67890 JUMPS! — ¿But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

`LucidaSansOT-Italic`

For £45, almost anything can be found floating in fields. ¡THE DAZED BROWN FOX QUICKLY GAVE 12345–67890 JUMPS! — ¿But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

`LucidaSansOT-Demi`

For £45, almost anything can be found floating in fields. ¡THE DAZED BROWN FOX QUICKLY GAVE 12345–67890 JUMPS! — ¿But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

`LucidaSansOT-DemiItalic`

2.2 Samples: Lucida Sans Typewriter OT

The monospaced `LucidaSansTypewriterOT` family is again available in the usual four variants; no small caps or oldstyle figures.

```
For £45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ?`But aren't Kafka's
Schloß and Æsop's Œuvres often naïve vis-à-vis the
dæmonic phœnix's official rôle in fluffy soufflés?
```

`LucidaSans TypewriterOT`

```
For £45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ?`But aren't Kafka's
Schloß and Æsop's Œuvres often naïve vis-à-vis the
dæmonic phœnix's official rôle in fluffy soufflés?
```

`LucidaSans TypewriterOT-Oblique`

```
For £45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ?`But aren't Kafka's
Schloß and Æsop's Œuvres often naïve vis-à-vis the
dæmonic phœnix's official rôle in fluffy soufflés?
```

`LucidaSans TypewriterOT-Bold`

For £45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

`LucidaSans TypewriterOT-BoldOblique`

2.3 Samples: Lucida Grande Mono DK

The monospaced `LucidaGrandeMonoDK` family is available in the usual four variants; no small caps or oldstyle figures.

As mentioned at the beginning, the principal design difference from `LucidaSansTypewriter` is a squarish style for O (oh), Q, and related characters, and an open, rather than slashed, zero by default. A few other characters differ as well.

In addition, the Grande Mono fonts support the WGL4 (Windows Glyph List) repertoire, thus including Greek and Cyrillic.

```
For £45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ?`But aren't Kafka's
Schloß and Æsop's Œuvres often naïve vis-à-vis the
dæmonic phœnix's official rôle in fluffy soufflés?
```

`LucidaGrande MonoDK`

For £45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

`LucidaGrande MonoDK-Italic`

For £45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

`LucidaGrande MonoDK-Bold`

For £45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

`LucidaGrande MonoDK-BoldItalic`

2.4 Samples: Lucida Console DK

The monospace `LucidaConsoleDK` family is available in the usual four variants; no small caps or oldstyle figures.

The Console design has shorter capitals than `LucidaGrandeMono`, with the same style of O, Q, 0, and related. The Console fonts also support WGL4.

```
For £45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ?`But aren't Kafka's
Schloß and Æsop's Œuvres often naïve vis-à-vis the
dæmonic phœnix's official rôle in fluffy soufflés?
```
LucidaConsoleDK

```
For £45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ?`But aren't Kafka's
Schloß and Æsop's Œuvres often naïve vis-à-vis the
dæmonic phœnix's official rôle in fluffy soufflés?
```
LucidaConsoleDK-Italic

```
For £45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ?`But aren't Kafka's
Schloß and Æsop's Œuvres often naïve vis-à-vis the
dæmonic phœnix's official rôle in fluffy soufflés?
```
LucidaConsoleDK-Bold

```
For £45, almost anything can be found floating in
fields. !`THE DAZED BROWN FOX QUICKLY GAVE
12345--67890 JUMPS! --- ?`But aren't Kafka's
Schloß and Æsop's Œuvres often naïve vis-à-vis the
dæmonic phœnix's official rôle in fluffy soufflés?
```
LucidaConsoleDK-BoldItalic

2.5 Samples: Blackletter, Calligraphy, Handwriting

These three specialized text fonts are included: `LucidaBlackletterOT`, `LucidaCalligraphyOT`, and `LucidaHandwritingOT`.

for £45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

Lucida BlackletterOT

For £45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

<div style="text-align:right">`Lucida CalligraphyOT`</div>

For £45, almost anything can be found floating in fields. !`THE DAZED BROWN FOX QUICKLY GAVE 12345--67890 JUMPS! --- ?`But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

<div style="text-align:right">`Lucida HandwritingOT`</div>

2.6 Samples: Lucida Bright Math OT

Finally, two OpenType math fonts are provided: `LucidaBrightMathOT` and `LucidaBrightMathOT-Demi`. The `-Demi` variant has bold letters in the normal positions, to be used for typesetting math within bold text, such as section headings. This is distinct from the math characters which are specified as bold in Unicode for specific semantics; those are bold in both math fonts.

$$e^{i\pi} + 1 = 0 \qquad \text{\texttt{LucidaBrightMathOT}}$$

$$\boldsymbol{e^{i\pi} + 1 = 0} \qquad \text{\texttt{LucidaBrightMathOT-Demi}}$$

The above are the Lucida OpenType fonts available from TUG. Many additional fonts are available directly from B&H: see `lucidafonts.com`.

3 Font features in Lucida OpenType

3.1 General features in Lucida OpenType text fonts

The following are the OpenType features available in (at least some of) the Lucida text fonts:

feature	description	default(*)
`dlig`	discretionary ligatures (f-ligatures in typewriter font)	off
`liga`	standard ligatures (f-ligatures in most fonts)	on
`onum`	old style numbers	off
`smcp`	small caps	off
`zero`	slashed zero	off
`locl`	script/language specific (localized) forms	on

The `locl` feature is described in the next section.

(*) Which features are on or off by default is controlled by the application program, not the font. The settings listed here are the most common defaults for OpenType-aware applications.

One more feature, `ss01`, has different meanings in different fonts:

feature	font	description
ss01	Lucida Sans & Typewriter	use dotted zero: 0 vs. default 0.
ss01		use Lucida-standard shapes:
	Lucida Grande Mono	0OQ vs. default 0OQ;
	Lucida Console	0OQ vs. default 0OQ.

The following table shows which features are available—not necessarily on by default—in which text fonts. (Math features follow.)

font name	dlig	liga	onum	smcp	zero	ss01
LucidaBrightOT		x	x	x		
LucidaBrightOT-Demi		x	x	x		
LucidaBrightOT-Italic		x	x			
LucidaBrightOT-DemiItalic		x	x			
LucidaSansOT		x			x	x
LucidaSansOT-Demi		x			x	x
LucidaSansOT-Italic		x			x	x
LucidaSansOT-DemiItalic		x			x	x
LucidaSansTypewriterOT	x				x	x
LucidaSansTypewriterOT-Bold	x				x	x
LucidaSansTypewriterOT-Oblique	x				x	x
LucidaSansTypewriterOT-BoldOblique	x				x	x
LucidaGrandeMonoDK	x				x	x
LucidaGrandeMonoDK-Bold	x				x	x
LucidaGrandeMonoDK-Italic	x				x	x
LucidaGrandeMonoDK-BoldItalic	x				x	x
LucidaConsoleDK	x				x	x
LucidaConsoleDK-Bold	x				x	x
LucidaConsoleDK-Italic	x				x	x
LucidaConsoleDK-BoldItalic	x				x	x
LucidaBlackletterOT			x			
LucidaCalligraphyOT			x			
LucidaHandwritingOT			x			

Incidentally, two additional features are present in the fonts: `mark` and `mkmk`. These are related to accent positioning, but at this time they are experimental, not supported, and hence not documented.

3.2 Language-specific features in Lucida OpenType

The Lucida text fonts have two language-specific features:

- with language NLD (Dutch) and when both of the `locl` and `liga` features are on, ij and IJ ligatures are activated: ij IJ. Available in the four Lucida Bright fonts.

- with language TRK (Turkish) and when both `locl` and `smcp` are on, the small cap i has a dot to differentiate it from dotless i: i ı. If just `locl` is on, the 'fi' and 'ffi' ligatures are disabled: fi ffi. Available in the four Lucida Bright and four Lucida Sans Typewriter fonts.

3.3 Math features in Lucida OpenType

Following are the OpenType features for the math fonts. All math font features work only when the OpenType script `Math` is specified; this is the default in math mode.

ss01   alternate Latin lower case math italic identical to text italic. This option is not recommended as Greek ν (nu) and Latin v (vee) become too similar; cf. the default vee: v.

ss02   smaller arrows (original Type 1 size): ⇑ vs. default ⇑.

ss03   smaller operators (original Type 1 size): ∑ vs. default ∑.

ss04   calligraphic alternative (similar to the Type 1 design) to the math script alphabet: $\mathcal{ABC}\, xyz$ vs. default $\mathscr{ABC}\, xyz$.

ss05   use a slashed-zero style for the empty set character (U+2205): $\emptyset$ vs. default $\varnothing$.

The Lucida math fonts were originally (and still are) available in Type 1 format for use with LaTeX and TeX. Some design changes have been made in these OpenType versions. For those who want to use the original designs, the `ss02`, `ss03`, and `ss04` alternatives above are offered; the `ss01` feature also corresponds to an option in the Type 1 support.

Which math features are available in which fonts:

font name	ss01	ss02	ss03	ss04	ss05
LucidaBrightMathOT	x	x	x	x	x
LucidaBrightMathOT–Demi	x			x	x

For completeness, the math fonts also define features named `dtls` and `ssty`; these are used internally by typesetting programs.

4 TEX and Lucida OpenType

In the TEX world, OpenType fonts can be found in either of two ways: as files within the usual TEX trees (examples given here), or as "system fonts" (example given in the `lucidaot-sys-example` document).

To load Lucida OpenType as TEX files, of course they must first be installed in your TEX setup; please see the `INSTALL-TeX.txt` file in the Lucida distribution for how to do that.

Lucida OpenType can be used with both LATEX and ConTEXt (in general, with any macro package providing OpenType text and math support).

As mentioned at the beginning, the fonts can be used with any application supporting OpenType, including the LuaTEX and XƎTEX extensions of TEX (but not pdfTEX). However, as LuaTEX and XƎTEX have very different implementations of OpenType math typesetting, there are unavoidable differences in the output. We hope this will be improved in future releases of the programs.

4.1 Prerequisite LATEX packages

In LATEX, the Lucida OpenType fonts are used in conjunction with the standard packages `fontspec` and `unicode-math`. The former handles text fonts, the latter math. Reading their (extensive) documentation is highly recommended.

You should already have these macro packages installed as part of your TEX distributions. If either is missing, please look for help with your distribution, or you can install the packages yourself: `http://ctan.org/pkg/fontspec` and `http://ctan.org/pkg/unicode-math` respectively.

4.2 Loading Lucida in LATEX

Once the Lucida OpenType fonts and required packages are installed, using them for the main text fonts in a LATEX document requires first loading the `fontspec` package, and then using its `\setmainfont` command. The argument, `LucidaBrightOT.otf`, is passed with the explicit extension `.otf`; this is what tells the engines to search the TEX trees (instead of the system fonts).

```
\usepackage{fontspec} % support for OpenType text fonts
\defaultfontfeatures{Scale=.92}
\setmainfont[Ligatures=TeX]{LucidaBrightOT.otf}
```

The `Ligatures=TeX` option makes conventional TeX input sequences, such as `---`, still work as expected. (This is the default in `fontspec` as of version 2.4.) The scaling brings the large Lucida fonts closer to design sizes of other typefaces. Of course these settings are completely optional.

In older versions of `fontspec`, when specifying OpenType fonts by filename (though not with system font lookups), it was necessary to explicitly specify the italic, bold, and bold italic file names. It should no longer be necessary, but here's the fallback code just in case you're working with an old version:

```
\setmainfont[% main font
  Ligatures=TeX,
     ItalicFont=LucidaBrightOT-Italic.otf,
        BoldFont=LucidaBrightOT-Demi.otf,
  BoldItalicFont=LucidaBrightOT-DemiItalic.otf,
  ]{LucidaBrightOT.otf}
```

You will probably also want to switch the sans and typewriter (monospaced) families to Lucida. They need the same help to define the italic and bold variants:

```
\setsansfont[[Ligatures=TeX,ItalicFont=...]{LucidaSansOT.otf}
\setmonofont[ItalicFont=...]{LucidaSansTypewriterOT.otf}
```

Finally, to use Lucida OpenType for math requires loading the package `unicode-math` and then calling its `\setmathfont` command. If you need the `\boldmath` command, the font for that also has to be set:

```
% support for OpenType math fonts:
\usepackage{unicode-math}
\setmathfont{LucidaBrightMathOT.otf}
\setmathfont[version=bold]{LucidaBrightMathOT-Demi.otf}
```

(The `version=bold` option is supported only in `unicode-math` versions newer than 2011/01/29. For older versions, a workaround is to reset the main math font; the source to this document has an example.)

Naturally, you should change the options specified according to your own needs. As a starting point, you can copy the exact commands from this document's source (`lucidaot.tex`) or the companion document that uses system font loading (`lucidaot-sys-example.tex`).

4.3   Basic LaTeX example

Given the above preamble, here's a small example of input:

```
\documentclass{article}
% ... preamble from above ...
\begin{document}
Here's some text. And here's some math:
\[ \phi(x)=\int_{-\infty}^{x} e^{-x^{2}/2} \]
Euro and copyright symbols are available:
\texteuro\ \textcopyright.
\end{document}
```

This results in the following output:

Here's some text. And here's some math:

$$\phi(x) = \int_{-\infty}^{x} e^{-x^2/2}$$

Euro and copyright symbols are available: € ©.

The `fontspec` package can be used to enable and disable the OpenType features listed in section 3. As an example, to enable the `ss04` math feature (alternate calligraphic) the `\setmathfont` call would look like this:

```
\setmathfont[RawFeature={+ss04}]{LucidaBrightMathOT.otf}
```

`fontspec` provides higher-level interfaces to some features, which are greatly preferable if available. For further examples and much more information, please see the `fontspec` documentation.

5   Closing

If you have questions or problems regarding installation or use, please email `lucida@tug.org`; this is an open and publicly archived list for Lucida discussion; you can subscribe on the web at `http://lists.tug.org/lucida`. On the other hand, questions or problems related to ordering or licensing should go to `lucida-admin@tug.org`.

Finally, B&H's web site for Lucida is `http://lucidafonts.com`, and the home page for Lucida and TeX is `http://tug.org/lucida`.