

LuaTeX: Microtypography for plain fonts

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In a previous article we discussed plain support for OpenType fonts [1]. The latest versions now also support font extending, slanting, protrusion and expansion, the “microtypography” TeX users know from pdfTeX [2]. Here are a few examples:

```
\pdfprotrudechars2
\pdfadjustspacing2

\font\test =
  file:lmroman12-regular:+liga;extend=1.5
\test\input tufte\par

\font\test =
  file:lmroman12-regular:+liga;slant=0.8
\test\input tufte\par

\font\test =
  file:lmroman12-regular:+liga;protrusion=default
\test\input tufte\par

\font\test =
  file:lmroman12-regular:+liga;expansion=default
\test\input tufte\par
```

The `extend` and `slant` options are similar to those used in map files. The value of `extend` is limited to being within the range $[-10, 10]$ and `slant` to $[-1, 1]$.

In the protrusion and expansion specification the keyword `default` is an entry in a definition table. You can find an example at the end of the file `font-dum.lua`.

A setup for expansion looks like this:

```
fonts.expansions.setups['default'] = {
  stretch = 2, shrink = 2, step = .5,
  factor = 1,
  [byte('A')] = 0.5, [byte('B')] = 0.7,
  .....
  [byte('8')] = 0.7, [byte('9')] = 0.7,
}
```

The stretch, shrink and steps become font properties and characters get a value assigned. In pseudo-code, it looks like:

```
chr(A).expansion_factor = 0.5 * factor
```

The protrusion table has left and right protrusion factors for each relevant character.

```
fonts.protrusions.setups['default'] = {
  factor = 1, left = 1, right = 1,

  [0x002C] = { 0, 1 }, -- comma
  [0x002E] = { 0, 1 }, -- period
  [0x003A] = { 0, 1 }, -- colon
  .....
  [0x061B] = { 0, 1 }, -- arabic semicolon
  [0x06D4] = { 0, 1 }, -- arabic full stop
}
```

So, the comma will stick out in the right margin:

```
chr(comma).right_protruding
= right * 1 * factor * (width/quad)
```

We prefer measures relative to the width (percentages), as this allows, for example, a simple 100% to give a full protrusion.

You can add additional tables and access them by keyword in the font specification.

The model used in the plain variant is a simplification of the ConTeXt model; ConTeXt users should not take this as a starting point.

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References

- [1] Hans Hagen. Plain TeX and OpenType. <http://tug.org/TUGboat/Articles/tb30-2/tb95hagen-opentype.pdf>.
- [2] Hàn Thê Thành. *Micro-typographic extensions to the TeX typesetting system*, Ph.D. thesis, 2000. <http://tug.org/TUGboat/Articles/tb21-4/tb69thanh.pdf> and <http://pdftex.org>.