FoundryMaster

Creating OpenType Font Variations

In this brief manual the data flow for creating a variable font is explained. Please note that the current version of FoundryMaster is beta still. Hence the operation is preliminary and requires some attention. This will be fixed and improved later. As example we have used the URW Geometric font family and the following weights for the creation of the variable font:

G081011T	URW Geometric Thin
G081013T	**URW Geometric Regular**
G081019T	URW Geometric Black
G081041T	URW Geometric Condensed Thin
G081041T	URW Geometric Condensed Regular
G081049T	URW Geometric Condensed Black
G081081T	URW Geometric Expanded Thin
G081083T	URW Geometric Expanded Regular
G081089T	URW Geometric Expanded Black

The embolded URW Geometric Regular is the *master font*.

① Step 1: Create your *master font* and all the Instances necessary to define the axis and corrections.

② Step 2: Check the isomorphism of the fonts.

Isomorphism (biology): similarity or identity of form, shape, or structure .

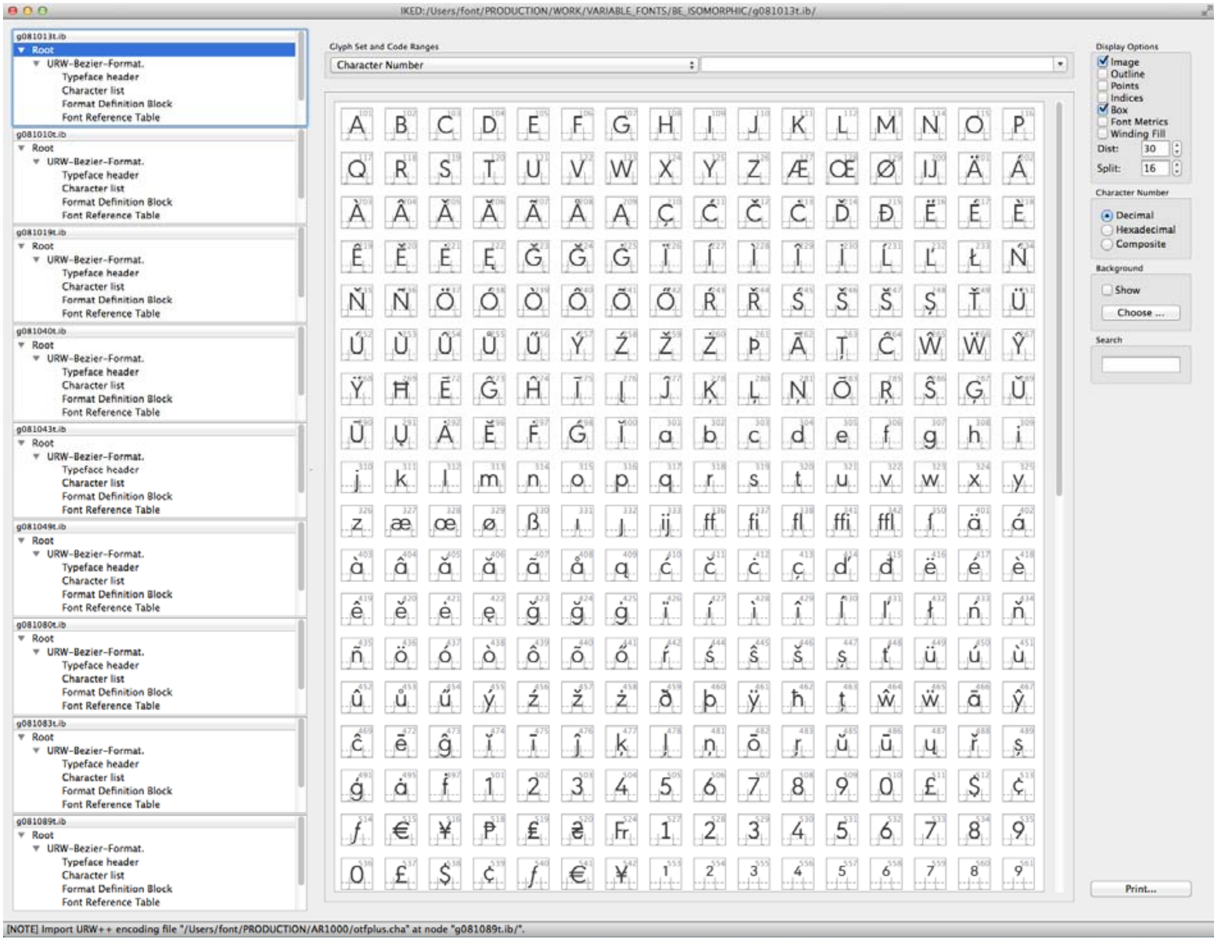
Here it is used as a term to decribe that two glyphs have:
– the same number of points,
– the same sequence of control and anchor points,
– the same number of contours,
– the same ordering of the contours,
– the same sense of rotation of all contours,
– the same location of the start point.

In FoundryMaster we have introduced the option in the side by side viewer to check whether glyphs are isomorphic .

We have also introduced advanced functions to make two glyphs isomorphic using the interpolation tool in the glyph editor. This will be described below.

On the next page you will see the side-by-side viewer for the nine fonts mentioned above.

Open all fonts in FoundryMaster (the *master font* first):



IKED:/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081013t.ib/

g081013t.ib, g081010t.ib, g081019t.ib, g081040t.ib, g081043t.ib, g081049t.ib, g081080t.ib, g081083t.ib, g081089t.ib

- Root
  - URW-Bezier-Format.
    - Typeface header
    - Character list
    - Format Definition Block
    - Font Reference Table

Glyph Set and Code Ranges: Character Number

Display Options: ☑ Image □ Outline □ Points □ Indices ☑ Box □ Font Metrics □ Winding Fill

Dist: 30

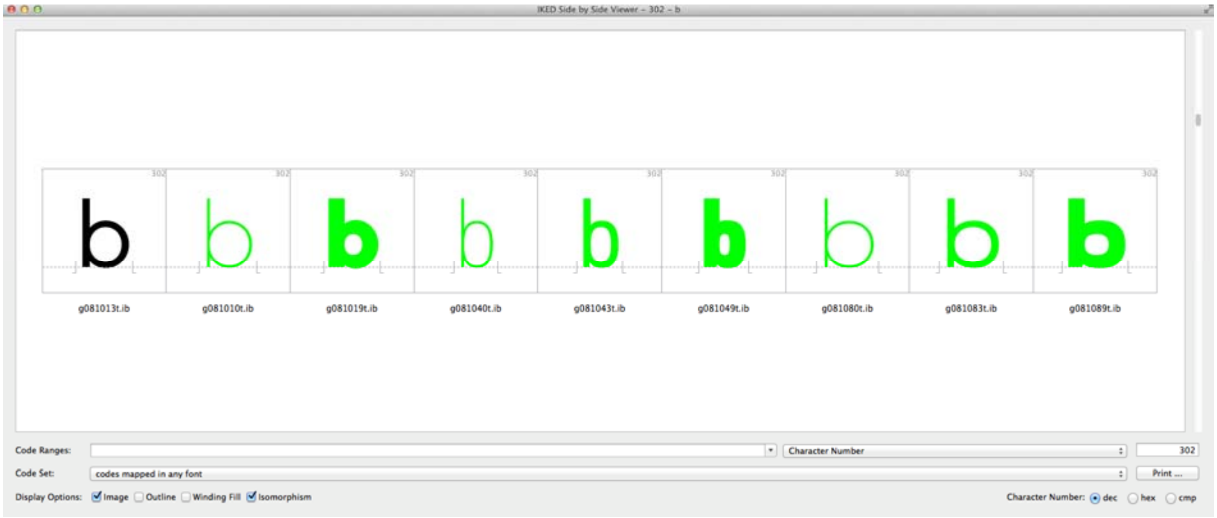
Split: 16

Character Number: ● Decimal ○ Hexadecimal ○ Composite

Background: □ Show

[NOTE] Import URW++ encoding file "/Users/font/PRODUCTION/AR1000/otfplus.cha" at node "g081089t.ib/".

Isomorphic characters are displayed in green (if the isomorphy check box is activated).



IKED Side by Side Viewer – 302 – b

g081013t.ib
g081010t.ib
g081019t.ib
g081040t.ib
g081043t.ib
g081049t.ib
g081080t.ib
g081083t.ib
g081089t.ib

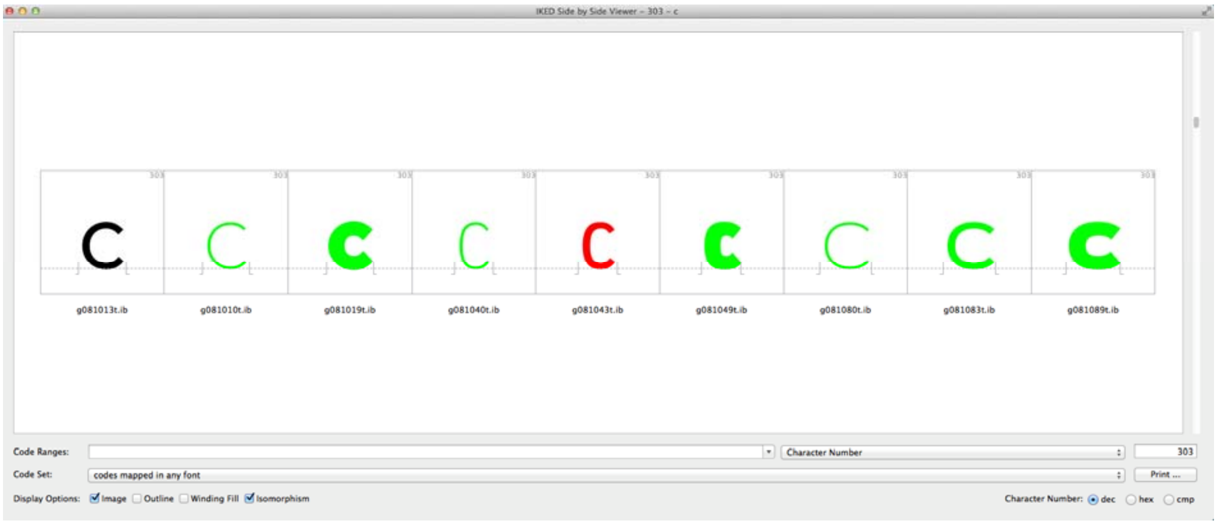
Code Ranges: Character Number 302

Code Set: codes mapped in any font

Display Options: ☑ Image □ Outline □ Winding Fill ☑ Isomorphism

Character Number: ● dec ○ hex ○ cmp

Characters that are not isomorphic will be displayed in red (if the 'isomorphism' check box is activated):



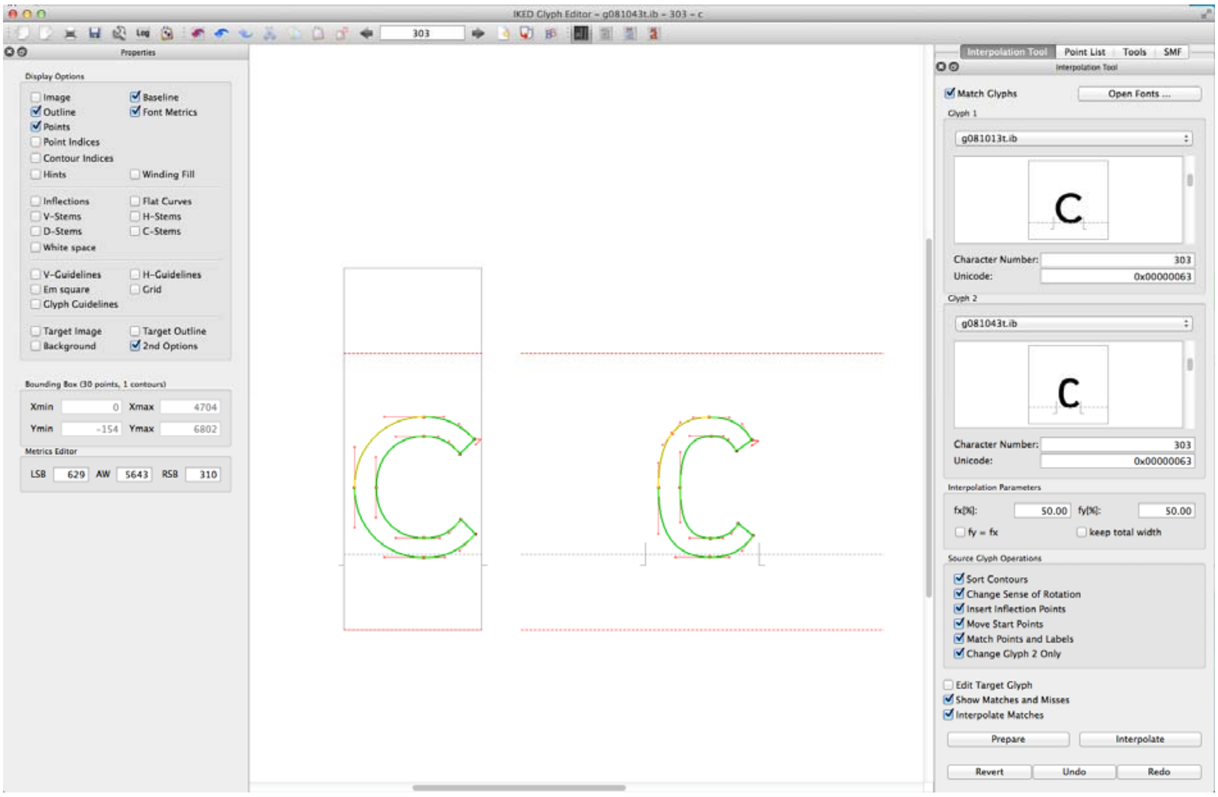
Code Ranges: Character Number 303

Code Set: codes mapped in any font

Display Options: ☑ Image □ Outline □ Winding Fill ☑ Isomorphism

Character Number: ● dec ○ hex ○ cmp

These contours can be edited in the interpolation tool of the glyph editor:



Display Options

□ Image ☑ Baseline

☑ Outline ☑ Font Metrics

☑ Points

□ Point Indices

□ Contour Indices

□ Hints □ Winding Fill

□ Inflections □ Flat Curves

□ V-Stems □ H-Stems

□ D-Stems □ C-Stems

□ White space

□ V-Guidelines □ H-Guidelines

□ Em square □ Grid

□ Glyph Guidelines

□ Target Image □ Target Outline

□ Background ☑ 2nd Options

Bounding Box (30 points, 1 contours)

Xmin 0 Xmax 4704

Ymin -154 Ymax 6802

Metrics Editor

LSB 629 AW 5643 RSB 310

☑ Match Glyphs

Glyph 1

g081013t.ib

Character Number: 303

Unicode: 0x00000063

Glyph 2

g081043t.ib

Character Number: 303

Unicode: 0x00000063

Interpolation Parameters

fx[%]: 50.00 fy[%]: 50.00

□ fy = fx □ keep total width

Source Glyph Operations

☑ Sort Contours

☑ Change Sense of Rotation

☑ Insert Inflection Points

☑ Move Start Points

☑ Match Points and Labels

☑ Change Glyph 2 Only

□ Edit Target Glyph

☑ Show Matches and Misses

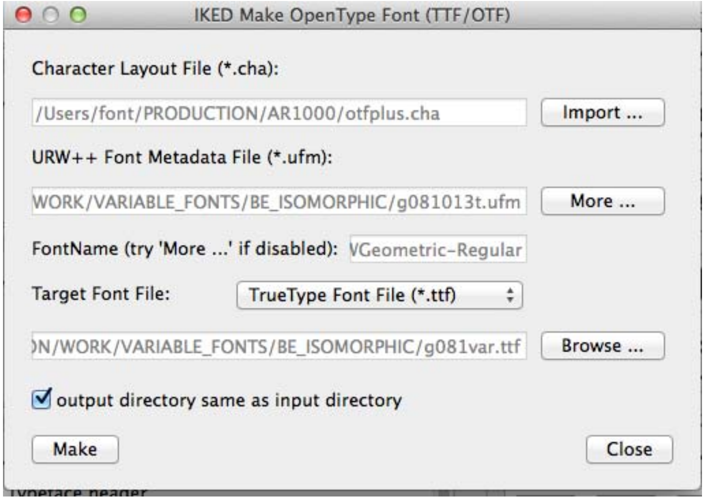
☑ Interpolate Matches

The parts of the outline that do not match are colored yellow to indicate that this problem can be fixed automatically.

Make sure all glyphs are isomorphic before making the next step!

③ Step 3 : Create TTF font

The *master font* (which must have been opened first and has to be the first in the list of open fonts) can be converted into a TTF font as usual now. Please select a layout file (.cha) , a meta data file (.ufm) and open the 'Create TTF' dialogue:



IKED Make OpenType Font (TTF/OTF)

Character Layout File (*.cha): /Users/font/PRODUCTION/AR1000/otfplus.cha

URW++ Font Metadata File (*.ufm): WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081013t.ufm

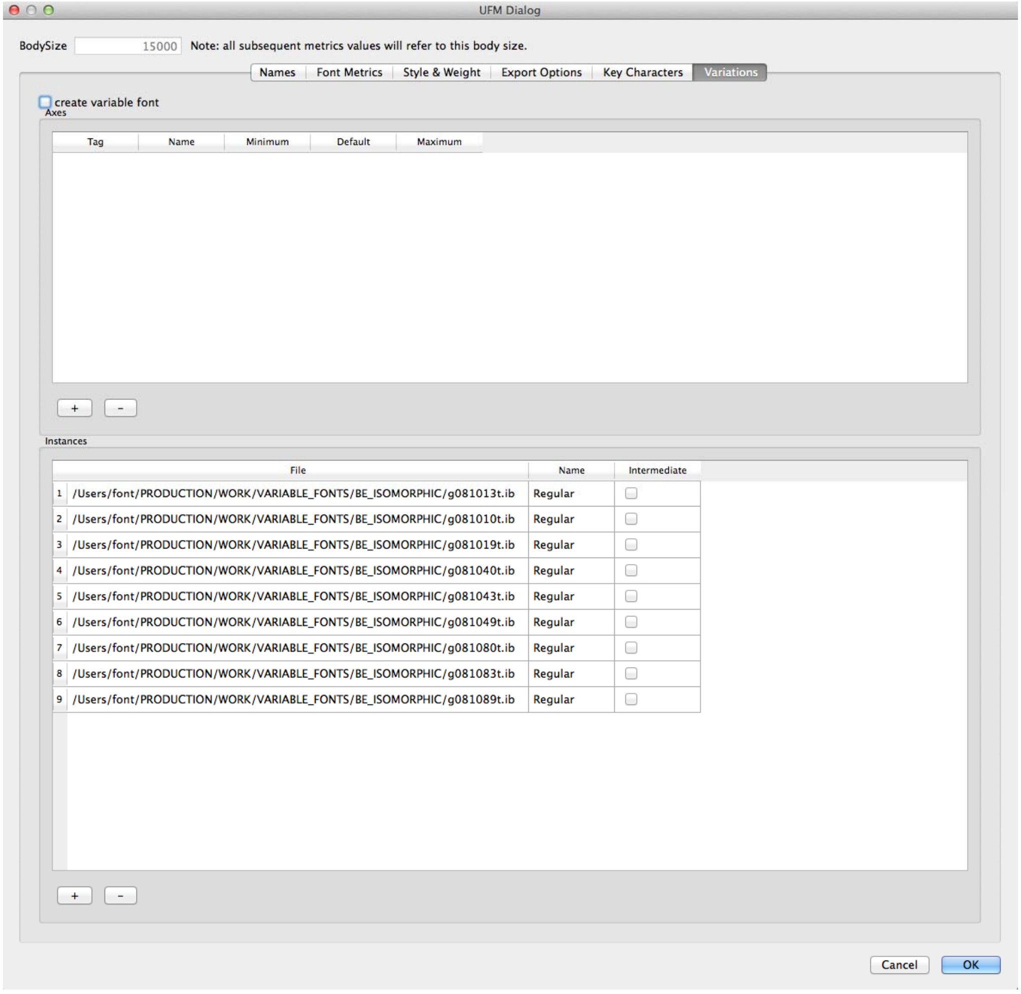
FontName (try 'More ...' if disabled): VGeometric-Regular

Target Font File: TrueType Font File (*.ttf)

ɔN/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081var.ttf

☑ output directory same as input directory

Click on 'More...' and select the 'Variation' page:



UFM Dialog

BodySize 15000 Note: all subsequent metrics values will refer to this body size.

□ create variable font

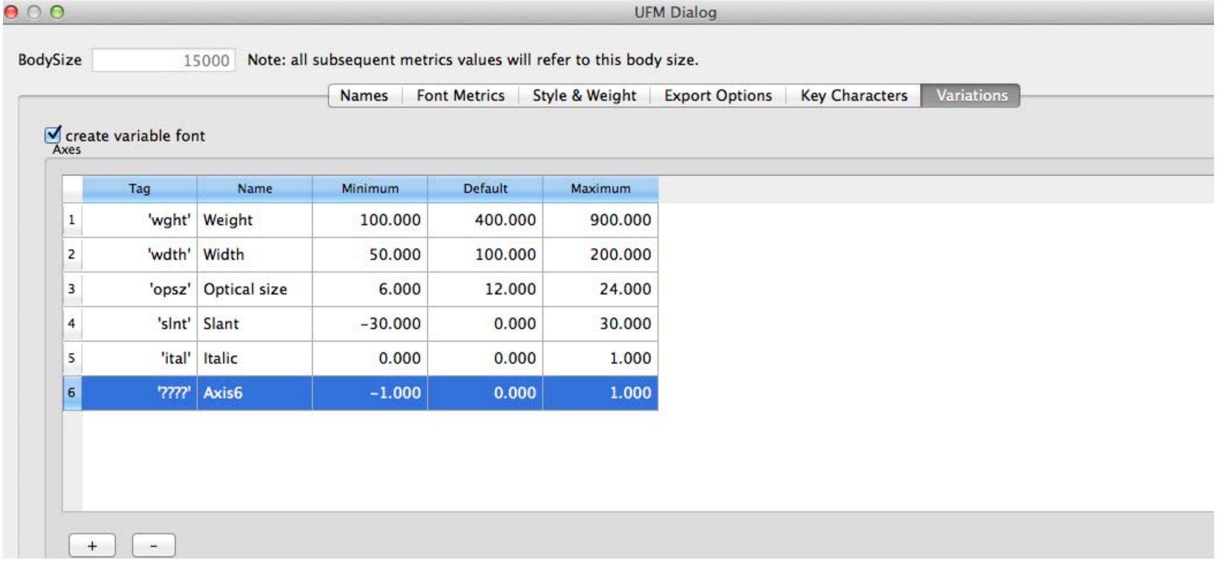
Axes

Tag	Name	Minimum	Default	Maximum

Instances

	File	Name	Intermediate
1	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081013t.ib	Regular	□
2	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081010t.ib	Regular	□
3	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081019t.ib	Regular	□
4	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081040t.ib	Regular	□
5	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081043t.ib	Regular	□
6	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081049t.ib	Regular	□
7	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081080t.ib	Regular	□
8	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081083t.ib	Regular	□
9	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081089t.ib	Regular	□

Now set the check box 'create variable font' (top left) and add the required axis by clicking on the '+' sign. By default the program will first add the *weight* axis, second the *width* axis and then the *opsz*, *slant* and *ital* axis. These are all not required, i.e., they can be deleted (with the '-') or edited. Next an unkown axis will be added that has to edited (for example '*spac*').



BodySize 15000 Note: all subsequent metrics values will refer to this body size.

☑ create variable font

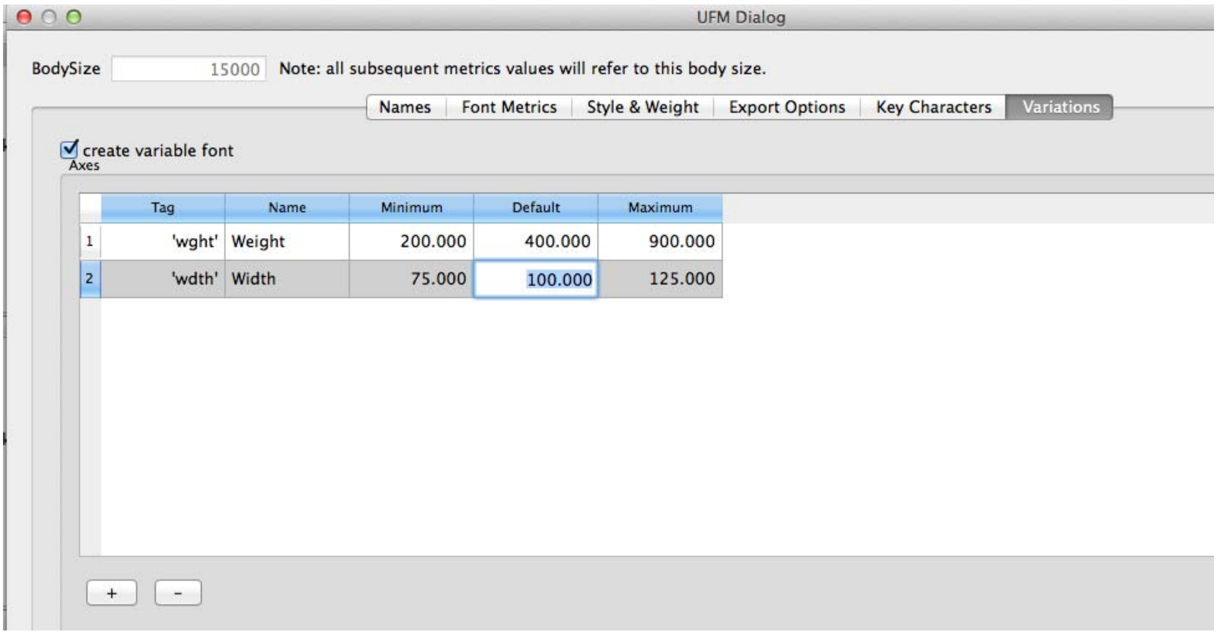
Axes

	Tag	Name	Minimum	Default	Maximum
1	'wght'	Weight	100.000	400.000	900.000
2	'wdth'	Width	50.000	100.000	200.000
3	'opsz'	Optical size	6.000	12.000	24.000
4	'slnt'	Slant	-30.000	0.000	30.000
5	'ital'	Italic	0.000	0.000	1.000
6	'????'	Axis6	-1.000	0.000	1.000

This allows to create the required axis for your variation font. In this case we need only the axis *width* and *weight*.

- ➔ Currently the min and max values for the axis must agree with the existing instances which are used to create the font. This will be modified in future.

A thin and a black weight have been created here, resulting in weight min and max of 200 and 900 and we have an expanded and condensed weight, resulting in 75 and 125 for the width axis.



BodySize 15000 Note: all subsequent metrics values will refer to this body size.

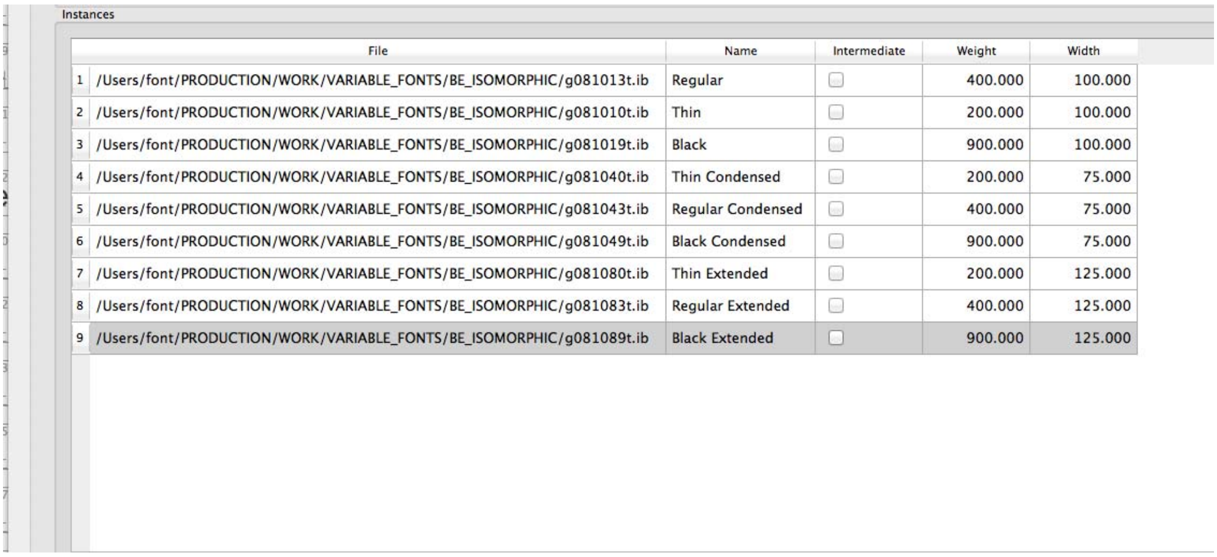
☑ create variable font

Axes

	Tag	Name	Minimum	Default	Maximum
1	'wght'	Weight	200.000	400.000	900.000
2	'wdth'	Width	75.000	100.000	125.000

As a next step fill in the names, width and weight values for the font instances, which will be used to create the variable font –in our case nine instances– including the *master font*.

- ➔ This information will be stored and partly automatically filled in in future. Currently we try to get the information of the width and the weight and the name from the meta file (.ufm) and the 'PCWeight' and 'WidthClass' entries.



Instances

	File	Name	Intermediate	Weight	Width
1	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081013t.ib	Regular	☐	400.000	100.000
2	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081010t.ib	Thin	☐	200.000	100.000
3	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081019t.ib	Black	☐	900.000	100.000
4	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081040t.ib	Thin Condensed	☐	200.000	75.000
5	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081043t.ib	Regular Condensed	☐	400.000	75.000
6	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081049t.ib	Black Condensed	☐	900.000	75.000
7	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081080t.ib	Thin Extended	☐	200.000	125.000
8	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081083t.ib	Regular Extended	☐	400.000	125.000
9	/Users/font/PRODUCTION/WORK/VARIABLE_FONTS/BE_ISOMORPHIC/g081089t.ib	Black Extended	☐	900.000	125.000

After selecting the names and the values please click 'ok'. Back in the TTF font generation menu click on 'make'.

The font can be checked with OTMaster, of course.