

Adventures in class kerning

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Scope

- Kerning data in OpenType fonts
 - Classic 'flat' kerning in KERN table
 - Advanced kerning in GPOS table ('kern' feature)

Agenda

- Kerning
 - ‘kern’ feature
 - comands
- Class kerning
 - classes
 - exceptions
 - optimization
 - subtable breaks

Kerning: space adjustment between two letters

Not kerned

Tom

ofym

Kerned

Tom



pos T o -120;

ofym



pos f y 50;

Kerning

| Agrave | Acute | Acircumflex | Atilde | Adieresis | Aring | AE | Coedilla |
|--------|--------|-------------|-------------|-------------|--------|-------------|------------|
| À | Á | Â | Ã | Ä | Å | Æ | Ç |
| Egrave | Eacute | Ecircumflex | Edieresis | Igrave | Iacute | Icircumflex | Idieresis |
| È | É | Ê | Ë | Ì | Í | Î | Ï |
| Eth | Ntilde | Ograve | Oacute | Ocircumflex | Otilde | Odieresis | multiply |
| Ð | Ñ | Ò | Ó | Ô | Õ | Ö | × |
| Oslash | Ugrave | Uacute | Ucircumflex | Udieresis | Yacute | Thorn | germandbls |
| Ø | Ù | Ú | Û | Ü | Ý | Þ | ß |
| agrave | acute | acircumflex | atilde | adieresis | aring | ae | cedilla |
| à | á | â | ã | ä | å | æ | ç |
| egrave | eacute | ecircumflex | edieresis | igrave | iacute | icircumflex | idieresis |
| è | é | ê | ë | ì | í | î | ï |
| eth | ntilde | ograde | oacute | ocircumflex | otilde | odieresis | divide |
| ð | ñ | ò | ó | ô | õ | ö | ÷ |
| oslash | ugrave | uacute | ucircumflex | udieresis | yacute | thorn | ydieresis |
| ø | ù | ú | û | ü | ý | þ | ÿ |

To Tò Tó Tô
Tõ Tö Tø Tœ

- pos T o -120;
- pos T ograve -120;
- pos T oacute -120;
- pos T ocircumflex -120;
- pos T otilde -120;
- pos T odieresis -120;
- pos T oslash -120;
- pos T oe -120;

Class kerning

- T class

T

- o class

o ograve oacute ocircumflex otilde
odieresis oslash oe

(o ò ó ô õ ö ø œ)

```
pos @_T @_o -120;
```

Class kerning

| T | Tearon | Toommaaccent | Tbar | o |
|------------------|------------------|-----------------|------------------|---------------------|
| Ŧ | Ŧ̈ | Ŧ̇ | Ŧ̄ | Ŧ |
| oacute | ocircumflex | odieresis | ograve | otilde |
| ó | ô | ö | ò | õ |
| oslash | oe | obreve | hungarumlaut | omacron |
| ø | œ | ö | ő | ō |
| oslashacute | obar | ohorn | odotbelow | ohook |
| ó̇ | ô̈ | ơ | ọ | ỏ |
| ocircumflexacute | ocircumflexgrave | ocircumflexhook | ocircumflextilde | ocircumflexdotbelow |
| ố | ồ | ở | ỗ | ộ |
| ohornacute | ohorngrave | ohornhook | ohorntilde | ohorndotbelow |
| ớ | ờ | ở | ỡ | ợ |

Ŧo Ŧò Ŧó Ŧô
 Ŧõ Ŧö Ŧø Ŧœ
 Ŧố Ŧồ Ŧở Ŧộ
 Ŧơ Ŧọ Ŧỏ Ŧố
 Ŧỡ Ŧợ Ŧớ ...

Class kerning

- T class

T Tcaron Tcommaaccent Tbar ...

(T Ě Ť Ʀ ...)

- o class

o ograve oacute ocircumflex
otilde odieresis oslash oe obreve
ohungarumlaut omacron
oslashacute ohorn ...

(o ò ó ô õ ö ø œ ő ó õ ø σ ...)

```
pos @_T @_o -120;
```


Class kerning exceptions

To -120

Tó -120

Tö -120

Tò -120

Tõ -120

```
pos @_T @_o -120;
```

Class kerning exceptions

To -120

Tó -120

Tö -120

Tò -120

Tõ -120

Tö -40

Tò -80

Tõ -80

pos T odieresis -40;

pos T ograve -80;

pos T otilde -80;

pos @_T @_o -120;

Class kerning exceptions

To -120

Tó -120

Tö -120

Tò -120

Tõ -120

Tö -40

Tò -80

Tõ -80

```
pos T odieresis -40;
```

```
enum pos [T] [ograve otilde] -80;
```

```
pos @_T @_o -120;
```

Code optimization

Hand coded

```
pos T odieresis -40;  
  
enum pos @_T [ograde otilde] -80;  
  
pos @_T @_o -120;
```

FontLab

```
enum pos @_T odieresis -40;  
enum pos @_T ograve -80;  
enum pos @_T otilde -80;  
subtable;  
pos @_T @_o -120;
```

Code optimization 2

FontLab

```
pos atilde zdotaccent 50;
pos zcaron adieresis 50;
enum pos @_X_LC_LEFT_LAT aacute -100;
enum pos @_Z_LC_LEFT_LAT aacute 100;
subtable;
enum pos agrave @_Z_LC_RIGHT_LAT -100;
enum pos agrave @_X_LC_RIGHT_LAT -100;
subtable;
pos @_A_LC_LEFT_LAT @_X_LC_RIGHT_LAT 100;
pos @_X_LC_LEFT_LAT @_X_LC_RIGHT_LAT -100;
pos @_X_LC_LEFT_LAT @_Z_LC_RIGHT_LAT -100;
pos @_Z_LC_LEFT_LAT @_A_LC_RIGHT_LAT -100;
```

Adobe macro

```
pos agrave x -100;
pos atilde zdotaccent 50;
pos x aacute -100;
pos x x -100;
pos zcaron adieresis 50;

enum pos [agrave] @_Z_LC_RIGHT_LAT -100;
enum pos @_Z_LC_LEFT_LAT [aacute] 100;

pos @_A_LC_LEFT_LAT @_X_LC_RIGHT_LAT 100;
pos @_X_LC_LEFT_LAT @_Z_LC_RIGHT_LAT -100;
pos @_Z_LC_LEFT_LAT @_A_LC_RIGHT_LAT -100;
```

Code optimization 2

FontLab

```
pos atilde zdotaccent 50;
pos zcaron adieresis 50;
enum pos @_X_LC_LEFT_LAT aacute -100;
enum pos @_Z_LC_LEFT_LAT aacute 100;
subtable;
enum pos agrave @_Z_LC_RIGHT_LAT -100;
enum pos agrave @_X_LC_RIGHT_LAT -100;
subtable;
pos @_A_LC_LEFT_LAT @_X_LC_RIGHT_LAT 100;
pos @_X_LC_LEFT_LAT @_X_LC_RIGHT_LAT -100;
pos @_X_LC_LEFT_LAT @_Z_LC_RIGHT_LAT -100;
pos @_Z_LC_LEFT_LAT @_A_LC_RIGHT_LAT -100;
```

Adobe macro

```
pos agrave x -100;
pos atilde zdotaccent 50;
pos x aacute -100;
pos x x -100;
pos zcaron adieresis 50;
enum pos [agrave] @_Z_LC_RIGHT_LAT -100;
enum pos @_Z_LC_LEFT_LAT [aacute] 100;
pos @_A_LC_LEFT_LAT @_X_LC_RIGHT_LAT 100;
pos @_X_LC_LEFT_LAT @_Z_LC_RIGHT_LAT -100;
pos @_Z_LC_LEFT_LAT @_A_LC_RIGHT_LAT -100;
```

Class kerning table

| | | | | |
|---|---|--|--|--|
| | A | | | |
| V | • | | | |
| | | | | |
| | | | | |
| | | | | |

```
pos @_V @_A -100;
```

Class kerning table

| | | | | |
|---|---|--|--|--|
| | A | | | |
| V | • | | | |
| T | • | | | |
| | | | | |
| | | | | |

```
pos @_V @_A -100;
```

```
pos @_T @_A -120;
```


Class kerning table

| | A | V | | |
|---|---|---|--|--|
| V | • | | | |
| T | • | | | |
| A | | • | | |
| | | | | |

```
pos @_V @_A -100;
```

```
pos @_T @_A -120;
```

```
pos @_A @_V -150;
```

Class kerning table

| | A | V | | |
|---|---|---|--|--|
| V | • | | | |
| T | • | | | |
| A | | • | | |
| | | | | |

| | V | | | |
|---|---|--|--|--|
| O | • | | | |
| | | | | |
| | | | | |
| | | | | |

```
pos @_V @_A -100;  
pos @_T @_A -120;  
pos @_A @_V -150;  
subtable;  
pos @_O @_V -70;
```

Class kerning table

| | A | Δ | Λ | |
|---|---|---|---|--|
| V | • | | | |
| T | • | | | |
| Γ | | • | • | |
| | | | | |

pos @_V @_A -100;

pos @_T @_A -120;

pos @_Gamma @_Delta -150;

pos @_Gamma @_Lambda -130;

Class kerning table

| | A | | | |
|---|---|--|--|--|
| V | • | | | |
| T | • | | | |
| | | | | |
| | | | | |

| | Δ | Λ | | |
|---|---|---|--|--|
| Γ | • | • | | |
| | | | | |
| | | | | |
| | | | | |

```
pos @_V @_A -100;
```

```
pos @_T @_A -120;
```

```
subtable;
```

```
pos @_Gamma @_Delta -150;
```

```
pos @_Gamma @_Lambda -130;
```

Class kerning table

| | A | V | | |
|---|---|---|--|--|
| V | • | | | |
| T | • | | | |
| A | | • | | |
| | | | | |

| | V | O | | |
|---|---|---|--|--|
| O | • | | | |
| V | | • | | |
| | | | | |
| | | | | |

```
pos @_V @_A -100;  
pos @_T @_A -120;  
pos @_A @_V -150;  
subtable;  
pos @_O @_V -70;  
pos @_V @_O -60;
```

Summary

- Oder classes by LEFT glyph
- Group classes by script
- Add subtable breaks between scripts
- (Optimize substitutions)

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