

xCJK2uni 宏包

李清

sobenlee@gmail.com

2014/04/29 v0.2

1 简介

xCJK2uni 是一个 L^AT_EX 宏包, 提供了将 CJK 文字转换成 Unicode 的功能。以宏包形式实现 gbk2uni 程序的功能, 使得使用 CJK 和 hyperref 宏包时, 可以得到正确的书签。并提供了 /ToUnicode 映射文件, 使得使用 GBK 等编码时, 配合 cmap 宏包, 用 pdfL^AT_EX 编译得到的 pdf 文件支持查找、复制和粘贴。

xCJK2uni 只适用于下一节说明的有效编码和以 pdfL^AT_EX 作为编译引擎的工作方式。

xCJK2uni 依赖 l3kernel。应该与 CJK 或 CCT 等配合使用, 但 xCJK2uni 不会自动引入它们。

2 基本命令

<code>\useCJKencmap</code>	<code>\useCJKencmap {⟨Bg5 Bg5+ GB GBK JIS KS⟩}</code>
----------------------------	---

设置当前的编码环境。以上是 xCJK2uni 支持的文字编码, 缺省使用 GBK。xCJK2uni 会在 CJK 环境内自动更新支持的编码。

<code>\CJKchartouni</code> ★	<code>\CJKchartouni {⟨单个 CJK 文字⟩}</code>
------------------------------	--

将文字转换成 16 进制形式的 Unicode。例如 `\CJKchartouni{一}` 将得到 4E00。将它展开两次就可以得到结果。

<code>\CJKsfdtouni</code> ★	<code>\CJKsfdtouni {⟨plane⟩} {⟨slot⟩}</code>
-----------------------------	--

`⟨plane⟩` 表示由 .sfd 文件定义的字体的编号, `⟨slot⟩` 表示在子字体中的位置, 这个命令将得到该坐标位置的 Unicode。将它展开两次就可以得到结果。如果在当前编码下, 该坐标位置不合法, 将展开为空。

3 代码实现

3.1 xCJK2uni

```
1 < *package>
2 < @@=CJKtu>
3 \pdfTeX_if_engine:F
4 {
5   \msg_new:nnn { xCJK2uni } { pdfLaTeX }
6   { The~xCJK2uni~package~is~only~supported~in~pdfTeX. }
7   \msg_critical:nn { xCJK2uni } { pdfLaTeX }
8 }
9 \tl_new:N \l__CJKtu_sfd_tl
10 \prop_new:N \c__CJKtu_sfd_prop
11 \seq_new:N \c__CJKtu_encoding_seq
12 \int_new:N \l__CJKtu_i_min_int
13 \int_new:N \l__CJKtu_i_max_int
14 \int_new:N \l__CJKtu_ii_min_int
15 \int_new:N \l__CJKtu_ii_max_int
16 \int_new:N \l__CJKtu_gap_begin_int
17 \int_new:N \l__CJKtu_gap_end_int
18 \int_new:N \l__CJKtu_plane_int
```

```

19 \int_set:Nn \l__CJKtu_i_max_int { "FE }
20 \int_set:Nn \l__CJKtu_ii_max_int { "FE }

\__CJKtu_set_enc:nnnnnn

21 \cs_new_protected_nopar:Npn \__CJKtu_set_enc:nnnnnn #1#2#3#4#5#6
22 {
23   \seq_put_right:Nn \c__CJKtu_encoding_seq {#1}
24   \prop_gput:Nnn \c__CJKtu_sfd_prop {#1} {#2}
25   \int_const:cn { c__CJKtu_ #1 _i_min_int } {#3}
26   \int_const:cn { c__CJKtu_ #1 _ii_min_int } {#4}
27   \tl_if_empty:nTF {#5}
28   {
29     \int_const:cn { c__CJKtu_ #1 _gap_begin_int }
30     { \l__CJKtu_ii_max_int + \c_one }
31     \int_const:cn { c__CJKtu_ #1 _gap_end_int }
32     { \use:c { c__CJKtu_ #1 _gap_begin_int } }
33     \int_const:cn { c__CJKtu_ #1 _plane_int }
34     { \l__CJKtu_ii_max_int - (#4) + \c_one }
35   }
36   {
37     \int_const:cn { c__CJKtu_ #1 _gap_begin_int } { #5 + \c_one }
38     \int_const:cn { c__CJKtu_ #1 _gap_end_int } {#6}
39     \int_const:cn { c__CJKtu_ #1 _plane_int }
40     { (#5) - (#4) + \l__CJKtu_ii_max_int - (#6) + \c_two }
41   }
42   \cs_if_exist_use:NNTF \CJKaddEncHook
43   { {#1} { \__CJKtu_enc_map:nn {#1} {#2} } }
44   {
45     \AtBeginDocument
46     {
47       \cs_if_exist_use:NT \CJKaddEncHook
48       { {#1} { \__CJKtu_enc_map:nn {#1} {#2} } }
49     }
50   }
51 }
(End definition for \__CJKtu_set_enc:nnnnnn.)

```

__CJKtu_enc_map:nn

```

52 \cs_new_protected_nopar:Npn \__CJKtu_enc_map:nn #1#2
53 {
54   \int_set_eq:Nc \l__CJKtu_i_min_int { c__CJKtu_ #1 _i_min_int }
55   \int_set_eq:Nc \l__CJKtu_ii_min_int { c__CJKtu_ #1 _ii_min_int }
56   \int_set_eq:Nc \l__CJKtu_gap_begin_int { c__CJKtu_ #1 _gap_begin_int }
57   \int_set_eq:Nc \l__CJKtu_gap_end_int { c__CJKtu_ #1 _gap_end_int }
58   \int_set_eq:Nc \l__CJKtu_plane_int { c__CJKtu_ #1 _plane_int }
59   \cs_if_exist:cF { CJKtu_ #1 _sfd_map:nn }
60   { \group_begin: \file_input:n { xCJK2uni-#2.def } \group_end: }
61   \cs_set_eq:Nc \CJKtu_sfd_map:nn { CJKtu_ #1 _sfd_map:nn }
62 }
(End definition for \__CJKtu_enc_map:nn.)

```

__CJKtu_use_enc_map:n

```

63 \cs_new_protected_nopar:Npn \__CJKtu_use_enc_map:n #1
64 {
65   \prop_get:NxNTF \c__CJKtu_sfd_prop {#1} \l__CJKtu_sfd_tl
66   { \__CJKtu_enc_map:nn {#1} { \l__CJKtu_sfd_tl } }
67   { \msg_error:nnx { xCJK2uni } { invalid-encoding } {#1} }
68 }
69 \msg_new:nnn { xCJK2uni } { invalid-encoding }
70 {
71   The~encoding~`#1'~is~invalid.\\
72   Only~\seq_use:Nnnn \c__CJKtu_encoding_seq { ~and~ } { ,~ } { ,~and~ } ~
73   are~supported.
74 }
75 \cs_generate_variant:Nn \prop_get:NnNTF { Nx }

```

(End definition for `_CJKtu_use_enc_map:n`)

```

76 \_CJKtu_set_enc:nnnnnn { GB } { UGB } { "A1 } { "A1 } { } { }
77 \_CJKtu_set_enc:nnnnnn { JIS } { UJIS } { "A1 } { "A1 } { } { }
78 \_CJKtu_set_enc:nnnnnn { KS } { UKS } { "A1 } { "A1 } { } { }
79 \_CJKtu_set_enc:nnnnnn { Bg5 } { UBig5 } { "A1 } { "40 } { "7E } { "A1 }
80 \_CJKtu_set_enc:nnnnnn { Bg5+ } { UBg5plus } { "81 } { "40 } { "7E } { "80 }
81 \_CJKtu_set_enc:nnnnnn { GBK } { UGBK } { "81 } { "40 } { "7E } { "80 }

```

`_CJKtu_sfd_to_unicode:nn`

```

82 \cs_new_nopar:Npn \_CJKtu_sfd_to_unicode:nn #1#2
83 {
84   \tex_romannumeral:D -`0 \exp_last_unbraced:Nf
85   \_CJKtu_get_unicode:w \CJKtu_sfd_map:nn {#1} {#2} \s__stop
86 }

```

(End definition for `_CJKtu_sfd_to_unicode:nn`)

`_CJKtu_get_unicode:w`

```

87 \cs_new_nopar:Npn \_CJKtu_get_unicode:w #1 \s__stop
88 { \tl_if_empty:nF {#1} { \_CJKtu_get_unicode_aux:w #1 \q_stop } }
89 \cs_new_nopar:Npn \_CJKtu_get_unicode_aux:w #1 \or: #2 \q_stop
90 { \or: #2 \exp_stop_f: #1 }

```

(End definition for `_CJKtu_get_unicode:w`)

`_CJKtu_char_to_unicode:n`

```

91 \group_begin:
92 \char_set_catcode_active:n { "7F }
93 \cs_new_nopar:Npn \_CJKtu_char_to_unicode:n #1
94 {
95   \tex_romannumeral:D -`0
96   \int_compare:nNnTF { \tl_count:n {#1} } = \c_two
97   { \CJKtu_byte:NN #1 }
98   {
99     \tl_if_head_eq_meaning:nNTF {#1} ^^7f
100     { \_CJKtu_byte:wNwnw #1 }
101     { \_CJKtu_encoding_error: }
102   }
103 }
104 \cs_new_nopar:Npn \_CJKtu_byte:wNwnw ^^7f #1 ^^7f #2 ^^7f
105 { \CJKtu_byte_map:nn { `#1 } {#2} }
106 \cs_new_nopar:Npn \_CJKtu_byte:Nwnw #1 ^^7f #2 ^^7f
107 { \CJKtu_byte_map:nn { `#1 } {#2} }

```

(End definition for `_CJKtu_char_to_unicode:n`)

`\CJKtu_bookmarks_hook:`

```

108 \cs_new_protected_nopar:Npn \CJKtu_bookmarks_hook:
109 {
110   \cs_set_eq:NN ^^7f \_CJKtu_byte:Nwnw
111   \cs_set_eq:NN \CJK@XX \CJKtu_byte:NN
112   \cs_set_eq:NN \CJKchar \_CJKtu_byte:wnn
113   \cs_set_eq:NN \CCTchar \CJKtu_byte:nn
114   \cs_set_eq:NN \@CCTSetChar \_CJKtu_CCT_byte:NNN
115   \cs_set_eq:NN \_CJKtu_get_unicode:n \_CJKtu_UTF_xvi_be:n
116 }
117 \group_end:

```

(End definition for `\CJKtu_bookmarks_hook:.`)

`\CJKtu_byte:NN`

`_CJKtu_CCT_byte:NNN`

```

118 \cs_new_nopar:Npn \CJKtu_byte:NN #1#2
119 { \CJKtu_byte:nn { `#1 } { `#2 } }
120 \cs_new_nopar:Npn \_CJKtu_CCT_byte:NNN #1#2#3
121 { \CJKtu_byte:nn { `#1 } { `#3 } }

```

(End definition for `\CJKtu_byte:NN` and `_CJKtu_CCT_byte:NNN`.)

`_CJKtu_byte:wnn`

```

122 \cs_new_nopar:Npn \_CJKtu_byte:wnn #1# { \CJKtu_byte:nn }

```

(End definition for `_CJKtu_byte:wnn`.)

\CJKtu_byte:nn

```
123 \cs_new_nopar:Npn \CJKtu_byte:nn #1#2
124 {
125   \int_compare:nTF { \l__CJKtu_i_min_int <= #1 <= \l__CJKtu_i_max_int }
126   {
127     \int_compare:nTF { \l__CJKtu_ii_min_int <= #2 < \l__CJKtu_gap_begin_int }
128     { \CJKtu_byte_map:nn {#1} {#2} }
129     {
130       \int_compare:nTF
131       { \l__CJKtu_gap_end_int <= #2 <= \l__CJKtu_ii_max_int }
132       { \CJKtu_byte_map:nn {#1} {#2} }
133       { \__CJKtu_encoding_error: }
134     }
135   }
136   { \__CJKtu_encoding_error: }
137 }
138 \cs_new_nopar:Npn \__CJKtu_encoding_error:
139 { \exp_stop_f: \__msg_expandable_error:n { Wrong~encoding~scheme. } }
(End definition for \CJKtu_byte:nn.)
```

\CJKtu_byte_map:nn

```
140 \cs_new_nopar:Npn \CJKtu_byte_map:nn #1#2
141 {
142   \exp_args:Nf \__CJKtu_index_map:n
143   {
144     \int_eval:n
145     {
146       ( #1 - \l__CJKtu_i_min_int ) * \l__CJKtu_plane_int
147       + (#2) - \l__CJKtu_ii_min_int
148       \int_compare:nNfF {#2} < \l__CJKtu_gap_begin_int
149       { + \l__CJKtu_gap_begin_int - \l__CJKtu_gap_end_int }
150     }
151   }
152 }
(End definition for \CJKtu_byte_map:nn.)
```

__CJKtu_index_map:n

```
153 \cs_new_nopar:Npn \__CJKtu_index_map:n #1
154 {
155   \__CJKtu_get_unicode:n
156   {
157     \CJKtu_sfd_map:nn
158     { \int_div_truncate:nn {#1} { \c_two_hundred_fifty_six } + \c_one }
159     { \int_mod:nn {#1} { \c_two_hundred_fifty_six } }
160   }
161 }
(End definition for \__CJKtu_index_map:n.)
```

__CJKtu_get_unicode:n

```
162 \cs_new_nopar:Npn \__CJKtu_get_unicode:n #1
163 { \exp_last_unbraced:Nf \__CJKtu_get_unicode:w #1 \s__stop }
(End definition for \__CJKtu_get_unicode:n.)
```

__CJKtu_UTF_xvi_be:n

```
164 \cs_new_nopar:Npn \__CJKtu_UTF_xvi_be:n #1
165 { \exp_args:Nf \__CJKtu_UTF_xvi_aux:n { \int_eval:n { "#1 } } }
166 \cs_new_nopar:Npn \__CJKtu_UTF_xvi_aux:n #1
167 {
168   \HyPsd@DecimalToOctalFirst
169   { \int_div_truncate:nn {#1} { \c_two_hundred_fifty_six } }
170   \HyPsd@DecimalToOctalSecond
171   { \int_mod:nn {#1} { \c_two_hundred_fifty_six } }
172 }
```

(End definition for `_CJKtu_UTF_xvi_be:n`.)

```

173 \cs_if_exist_use:NTF \hypersetup { { unicode } }
174 { \PassOptionsToPackage { unicode } { hyperref } }
175 \AtBeginDocument
176 {
177   \@ifpackageloaded { CJKutf8 }
178   { \msg_warning:nn { xCJK2uni } { UTF-8-encoding } }
179   {
180     \cs_if_free:NF \pdfstringdefDisableCommands
181     {
182       \hypersetup { CJKbookmarks = false }
183       \pdfstringdefDisableCommands { \CJKtu_bookmarks_hook: }
184     }
185   }
186 }
187 \msg_new:nnn { xCJK2uni } { UTF-8-encoding }
188 { It~is~not~necessary~to~load~xCJK2uni~in~UTF-8~encoding. }

```

`\useCJKencmap`

`\CJKchartouni`

`\CJKsfdtouni`

```

189 \cs_new_eq:NN \useCJKencmap \_CJKtu_use_enc_map:n
190 \cs_new_eq:NN \CJKchartouni \_CJKtu_char_to_unicode:n
191 \cs_new_eq:NN \CJKsfdtouni \_CJKtu_sfd_to_unicode:nn
(End definition for \useCJKencmap, \CJKchartouni, and \CJKsfdtouni. These functions are documented on page 1.)
192 \useCJKencmap { GBK }
193 </package>

```

3.2 xCJK2uni-make

```

194 <*make>
195 \msg_new:nnn { xCJK2uni } { file-not-found }
196 {
197   SFD file~`#2'~for~encoding~`#1'~not~found.\\
198   xCJK2uni~will~not~work!
199 }
200 \msg_new:nnn { xCJK2uni } { shell-escape }
201 { Please~call~`#1'~with~the~--shell-escape'~option. }
202 \char_set_catcode_letter:N \@
203 \int_compare:nNnF
204 {
205   \cs_if_exist_use:NF \pdf@shellescape
206   { \cs_if_exist_use:NF \shellescape { \pdfshellescape } }
207 } = \c_one
208 {
209   \msg_fatal:nnx { xCJK2uni } { shell-escape }
210   {
211     \luatex_if_engine:TF { LuaLaTeX }
212     {
213       \pdftex_if_engine:TF
214       { \if_case:w \pdftex_pdfoutput:D LaTeX \else: pdfLaTeX \fi: }
215       { XeLaTeX }
216     }
217   }
218 }
219 \ior_new:N \g__CJKtu_sfd_ior
220 \tl_new:N \g__CJKtu_path_str
221 \tl_const:Nn \c__CJKtu_cmd_tl { kpsewhich ~ UGBK.sfd }
222 \luatex_if_engine:TF
223 { \tl_gset:Nx \g__CJKtu_path_str { \pdf@pipe { \c__CJKtu_cmd_tl } } }
224 {
225   \tex_immediate:D \tex_write:D 18
226   { \c__CJKtu_cmd_tl > \c_job_name_tl .aux }
227   \ior_open:NnTF \g__CJKtu_sfd_ior { \c_job_name_tl .aux }
228   {
229     \ior_get_str:NN \g__CJKtu_sfd_ior \g__CJKtu_path_str
230     \ior_close:N \g__CJKtu_sfd_ior

```

```

231     }
232     { \msg_fatal:nnnn { xCJK2uni } { file-not-found } { GBK } { UGBK.sfd } }
233 }
234 \tl_if_blank:oTF { \g__CJKtu_path_str }
235 { \msg_fatal:nnnn { xCJK2uni } { file-not-found } { GBK } { UGBK.sfd } }
236 {
237     \seq_set_split:NnV \l_tmpa_seq { / } \g__CJKtu_path_str
238     \seq_pop_right:NN \l_tmpa_seq \g__CJKtu_path_str
239     \tl_gset:Nx \g__CJKtu_path_str { \seq_use:Nn \l_tmpa_seq { / } }
240 }
241 \tl_const:Nx \c__CJKtu_hash_str { \iow_char:N \# }
242 \tl_const:Nx \c__CJKtu_lbrace_str { \iow_char:N \{ }
243 \tl_const:Nx \c__CJKtu_rbrace_str { \iow_char:N \} }
244 \tl_const:Nx \c__CJKtu_backslash_str { \iow_char:N \\ }
245 \tl_const:Nx \c__CJKtu_indent_str
246 { \c_catcode_other_space_tl \c_catcode_other_space_tl }
247 \iow_new:N \g__CJKtu_sfd_map_iow
248 \iow_new:N \g__CJKtu_sfd_cmap_iow
249 \seq_new:N \l__CJKtu_sfd_plane_seq
250 \seq_new:N \l__CJKtu_sfd_line_seq
251 \tl_new:N \l__CJKtu_sfd_plane_tl
252 \tl_new:N \l__CJKtu_cmap_block_tl
253 \int_new:N \l__CJKtu_sfd_index_int

```

\c__CJKtu_sfd_map_prop

```

254 \prop_new:N \c__CJKtu_sfd_map_prop
255 \prop_gput:Nnn \c__CJKtu_sfd_map_prop { GB } { { 10 } { UGB } }
256 \prop_gput:Nnn \c__CJKtu_sfd_map_prop { JIS } { { 40 } { UJIS } }
257 \prop_gput:Nnn \c__CJKtu_sfd_map_prop { KS } { { 60 } { UKS } }
258 \prop_gput:Nnn \c__CJKtu_sfd_map_prop { Bg5 } { { 00 } { UBig5 } }
259 \prop_gput:Nnn \c__CJKtu_sfd_map_prop { Bg5+ } { { 09 } { UBg5plus } }
260 \prop_gput:Nnn \c__CJKtu_sfd_map_prop { GBK } { { 19 } { UGBK } }
(End definition for \c__CJKtu_sfd_map_prop.)

```

__CJKtu_write_file:nnn

```

261 \cs_new_protected_nopar:Npn \__CJKtu_write_file:nnn #1#2#3
262 {
263     \group_begin:
264     \file_path_include:n { \g__CJKtu_path_str / }
265     \ior_open:NnTF \g__CJKtu_sfd_ior { #3.sfd }
266     {
267         \group_end:
268         \seq_clear:N \l__CJKtu_sfd_plane_seq
269         \iow_open:Nn \g__CJKtu_sfd_map_iow { xCJK2uni-#3.def }
270         \__CJKtu_write_sfd_map_header:nn {#1} {#3}
271         \ior_str_map_inline:Nn \g__CJKtu_sfd_ior
272         { \str_if_eq:nnT {##1} { 00 ~ 0x0000_0x00FF } { \ior_map_break: } }
273         \ior_str_map_inline:Nn \g__CJKtu_sfd_ior
274         {
275             \tl_if_blank:nTF {##1}
276             {
277                 \ior_map_break:n
278                 {
279                     \__CJKtu_write_sfd_map_trailer:n {#3}
280                     \__CJKtu_write_cmap_file:n {#2}
281                 }
282             }
283             { \__CJKtu_read_sfd_line:nnn {##1} {#1} {#2} }
284         }
285         \iow_close:N \g__CJKtu_sfd_cmap_iow
286         \iow_close:N \g__CJKtu_sfd_map_iow
287         \ior_close:N \g__CJKtu_sfd_ior
288         \seq_clear:N \l__CJKtu_sfd_plane_seq
289         \seq_clear:N \l__CJKtu_sfd_line_seq
290     }
291     {
292         \group_end:
293         \msg_critical:nxxx { xCJK2uni } { file-not-found } {#1} { #3.sfd }

```

```

294     }
295 }
(End definition for \_CJKtu_write_file:nnn.)

\_CJKtu_read_sfd_line:n
\_CJKtu_read_sfd_line:nn
296 \group_begin:
297 \char_set_lccode:nn { \c_zero } { `` }
298 \char_set_lccode:nn { \c_one } { `x }
299 \char_set_catcode_other:n { \c_zero }
300 \char_set_catcode_other:n { \c_one }
301 \tl_to_lowercase:n
302 {
303   \group_end:
304   \cs_new_protected_nopar:Npn \_CJKtu_read_sfd_line:nnn #1#2#3
305     { \_CJKtu_read_sfd_line:nwnn #1 ^^00 \q_nil \q_stop {#2} {#3} }
306   \cs_new_protected_nopar:Npn \_CJKtu_read_sfd_line:nwnn
307     #1 0^^01 #2 ^^00 #3 \q_stop #4#5
308     { \_CJKtu_read_sfd_line:nnnnn {#1} { 0^^01 } {#2} {#4} {#5} }
309 }
(End definition for \_CJKtu_read_sfd_line:n and \_CJKtu_read_sfd_line:nn.)

\_CJKtu_read_sfd_line:nnnnn
310 \cs_new_protected_nopar:Npn \_CJKtu_read_sfd_line:nnnnn #1#2#3#4#5
311 {
312   \tl_if_blank:nF {#1}
313   {
314     \seq_if_empty:NF \l__CJKtu_sfd_plane_seq
315     {
316       \iow_now:Nx \g__CJKtu_sfd_map_iow
317       {
318         \c__CJKtu_indent_str \c__CJKtu_indent_str
319         \token_to_str:N \fi: \iow_newline:
320         \c__CJKtu_indent_str \c__CJKtu_rbrace_str
321       }
322       \_CJKtu_write_cmap_file:n {#5}
323     }
324     \_CJKtu_write_plane_map:nn {#1} {#4}
325     \tl_set:Nx \l__CJKtu_sfd_plane_tl { \tl_trim_spaces:n {#1} }
326   }
327   \seq_set_split:Nnn \l__CJKtu_sfd_line_seq {#2} {#3}
328   \seq_concat:NNN \l__CJKtu_sfd_plane_seq
329     \l__CJKtu_sfd_plane_seq \l__CJKtu_sfd_line_seq
330   \iow_now:Nx \g__CJKtu_sfd_map_iow
331   {
332     \c__CJKtu_indent_str \c__CJKtu_indent_str \c__CJKtu_indent_str
333     \seq_use:Nn \l__CJKtu_sfd_line_seq { \or: }
334     \token_to_str:N \or:
335   }
336 }
(End definition for \_CJKtu_read_sfd_line:nnnnn.)

\_CJKtu_write_plane_map:nn
337 \cs_new_protected_nopar:Npn \_CJKtu_write_plane_map:nn #1#2
338 {
339   \iow_now:Nx \g__CJKtu_sfd_map_iow
340   {
341     \cs_new_nopar:cpn { ~ __CJKtu_ #2 _sfd_map_ \int_eval:n {#1} :n ~ } ~
342     \c__CJKtu_hash_str 1 \iow_newline:
343     \c__CJKtu_indent_str \c__CJKtu_lbrace_str \iow_newline:
344     \c__CJKtu_indent_str \c__CJKtu_indent_str
345     \exp_not:N \if_case:w \etex_numexpr:D
346     \c__CJKtu_hash_str 1 ~ \token_to_str:N \scan_stop:
347   }
348 }
(End definition for \_CJKtu_write_plane_map:nn.)

```

```

\__CJKtu_write_cmap_file:n
349 \cs_new_protected_nopar:Npn \__CJKtu_write_cmap_file:n #1
350 {
351   \tl_clear:N \l__CJKtu_cmap_block_tl
352   \int_zero:N \l__CJKtu_sfd_index_int
353   \iow_open:Nn \g__CJKtu_sfd_cmap_iow { c #1 \l__CJKtu_sfd_plane_tl .cmap }
354   \__CJKtu_write_cmap_header:nn { C #1 } { \l__CJKtu_sfd_plane_tl }
355   \iow_now:Nx \g__CJKtu_sfd_cmap_iow
356   {
357     \iow_newline:
358     1~begincodespacerange \iow_newline:
359     \c__CJKtu_indent_str < 00 > ~
360     <
361     \int_to_hexadecimal:n
362     { \seq_count:N \l__CJKtu_sfd_plane_seq - \c_one }
363     > \iow_newline:
364     endcodespacerange
365   }
366   \seq_map_function:NN \l__CJKtu_sfd_plane_seq \__CJKtu_write_cmap_body:n
367   \tl_if_empty:NF \l__CJKtu_cmap_block_tl
368   {
369     \iow_now:Nx \g__CJKtu_sfd_cmap_iow
370     {
371       \iow_newline:
372       \int_mod:nn { \l__CJKtu_sfd_index_int } { \c_one_hundred } ~
373       beginbfchar \iow_newline:
374       \l__CJKtu_cmap_block_tl
375       endbfchar
376     }
377   }
378   \__CJKtu_write_cmap_trailer:
379   \seq_clear:N \l__CJKtu_sfd_plane_seq
380 }
(End definition for \__CJKtu_write_cmap_file:n)

```

```

\__CJKtu_write_cmap_body:n
381 \cs_new_protected_nopar:Npn \__CJKtu_write_cmap_body:n #1
382 {
383   \int_case:nnTF { \l__CJKtu_sfd_index_int }
384   { { 99 } { } { 199 } { } }
385   {
386     \iow_now:Nx \g__CJKtu_sfd_cmap_iow
387     {
388       \iow_newline:
389       100 ~ beginbfchar \iow_newline:
390       \l__CJKtu_cmap_block_tl
391       < \int_to_hexadecimal:n { \l__CJKtu_sfd_index_int } > ~
392       <#1> \iow_newline:
393       endbfchar
394     }
395     \tl_clear:N \l__CJKtu_cmap_block_tl
396   }
397   {
398     \tl_put_right:Nx \l__CJKtu_cmap_block_tl
399     {
400       <
401       \int_compare:nNf \l__CJKtu_sfd_index_int > \c_fifteen { 0 }
402       \int_to_hexadecimal:n { \l__CJKtu_sfd_index_int }
403       > ~ <#1> \iow_newline:
404     }
405   }
406   \int_incr:N \l__CJKtu_sfd_index_int
407 }
(End definition for \__CJKtu_write_cmap_body:n)

```

```

\__CJKtu_write_sfd_map_header:nn
408 \group_begin:
409 \char_set_catcode_other:N \%

```



```

410 \cs_new_protected_nopar:Npn \__CJKtu_write_sfd_map_header:nn #1#2
411 {
412   \iow_now:Nx \g__CJKtu_sfd_map_iow
413   {
414     %% \iow_newline:
415     %%~This~is~file~`xCJK2uni-#2.def',\iow_newline:
416     %%~generated~from~file~`#2.sfd'~by~`xCJK2uni-make.ltx'.\iow_newline:
417     %% \iow_newline:
418     \__CJKtu_identification:n { xCJK2uni-#2.def }
419     \cs_new_nopar:cpn { ~ CJKtu_#1_sfd_map:nn ~ } ~ \c__CJKtu_hash_str 1
420     \iow_newline: \c__CJKtu_indent_str \c__CJKtu_lbrace_str \iow_newline:
421     \c__CJKtu_indent_str \c__CJKtu_indent_str
422     \token_to_str:N \cs_if_exist_use:cF
423     \iow_newline: \c__CJKtu_indent_str \c__CJKtu_indent_str \c__CJKtu_indent_str
424     { ~ __CJKtu_#1_sfd_map_ ~ \exp_not:N \int_eval:n { \c__CJKtu_hash_str 1 } ~ :n ~}
425     \iow_newline: \c__CJKtu_indent_str \c__CJKtu_indent_str \c__CJKtu_indent_str
426     { ~ \exp_not:N \use_none:n } \iow_newline:
427     \c__CJKtu_indent_str \c__CJKtu_rbrace_str
428   }
429 }
(End definition for \__CJKtu_write_sfd_map_header:nn.)

```

__CJKtu_identification:n

```

430 \group_begin:
431 \char_set_catcode_space:n { 32 }
432 \tl_const:Nx \c__CJKtu_svn_id_str
433 {\tl_to_str:n {$Id: xCJK2uni.dtx 643 2014-04-29 09:36:22Z sobenlee $}}
434 \group_end:
435 \cs_new_nopar:Npx \__CJKtu_identification:n #1
436 {
437   \token_to_str:N \GetIdInfo \c__CJKtu_svn_id_str
438   \iow_newline:
439   \c__CJKtu_indent_str
440   \c__CJKtu_lbrace_str Convert~CJK~character~to~Unicode. \c__CJKtu_rbrace_str
441   \iow_newline:
442   \token_to_str:N \ProvidesExplFile \c__CJKtu_lbrace_str #1 \c__CJKtu_rbrace_str
443   \iow_newline:
444   \c__CJKtu_indent_str
445   \c__CJKtu_lbrace_str \token_to_str:N \ExplFileDate \c__CJKtu_rbrace_str
446   \c__CJKtu_lbrace_str 0.2 \c__CJKtu_rbrace_str
447   \c__CJKtu_lbrace_str \token_to_str:N \ExplFileDescription \c__CJKtu_rbrace_str
448   \iow_newline:
449 }
(End definition for \__CJKtu_identification:n.)

```

_CJKtu_write_sfd_map_trailer:n

```

450 \cs_new_protected_nopar:Npn \__CJKtu_write_sfd_map_trailer:n #1
451 {
452   \iow_now:Nx \g__CJKtu_sfd_map_iow
453   {
454     \c__CJKtu_indent_str \c__CJKtu_indent_str
455     \token_to_str:N \fi: \iow_newline:
456     \c__CJKtu_indent_str \c__CJKtu_rbrace_str \iow_newline:
457     %% \iow_newline:
458     %%~End~of~file~`xCJK2uni-#1.def'.
459   }
460 }
(End definition for \__CJKtu_write_sfd_map_trailer:n.)

```

_CJKtu_write_cmap_header:nn

```

461 \cs_new_protected_nopar:Npn \__CJKtu_write_cmap_header:nn #1#2
462 {
463   \iow_now:Nx \g__CJKtu_sfd_cmap_iow
464   {
465     %!PS-Adobe-3.0~Resource-CMap \iow_newline:
466     %DocumentNeededResources:~ProcSet~(CIDInit) \iow_newline:
467     %IncludeResource:~ProcSet~(CIDInit) \iow_newline:

```

```

468      %%BeginResource:~CMap~(TeX-#1-#2-0) \iow_newline:
469      %%Title:~(TeX-#1-#2-0~TeX~#1-#2~0) \iow_newline:
470      %%Version:~1.000 \iow_newline:
471      %%EndComments \iow_newline: \iow_newline:
472      /CIDInit~/ProcSet~findresource~begin \iow_newline: \iow_newline:
473      12~dict~begin \iow_newline: \iow_newline:
474      begincmap \iow_newline: \iow_newline:
475      /CIDSystemInfo~3~dict~dup~begin \iow_newline:
476      \c__CJKtu_indent_str /Registry~(TeX)~def \iow_newline:
477      \c__CJKtu_indent_str /Ordering~(#1-#2)~def \iow_newline:
478      \c__CJKtu_indent_str /Supplement~0~def \iow_newline:
479      end~def \iow_newline: \iow_newline:
480      /CMapName~/TeX-#1-#2-0~def \iow_newline:
481      /CMapVersion~1.000~def \iow_newline:
482      /CMapType~2~def \iow_newline: \iow_newline:
483      /WMode~0~def
484    }
485  }

```

(End definition for _CJKtu_write_cmap_header:nn.)

_CJKtu_write_cmap_trailer:

```

486 \cs_new_protected_nopar:Npx \_CJKtu_write_cmap_trailer:
487 {
488   \iow_now:Nn \g__CJKtu_sfd_cmap_iow
489   {
490     \iow_newline:
491     endcmap \iow_newline:
492     CMapName~currentdict~/CMap defineresource~pop \iow_newline:
493     end \iow_newline:
494     end \iow_newline: \iow_newline:
495     %%EndResource \iow_newline:
496     %%EOF
497   }
498 }

```

\group_end:

(End definition for _CJKtu_write_cmap_trailer:.)

```

500 \prop_map_inline:Nn \c__CJKtu_sfd_map_prop
501 { \_CJKtu_write_file:nnn {#1} #2 }

```

\tex_end:D

</make>

代码索引

斜体的数字表示对应项说明所在的页码,下划线的数字表示定义所在的代码行号,而直立的数字表示对应项使用时所在的行号。

Symbols		
\#	241	
\%	409	
\@	202	
\@CCTSetChar	114	
\@ifpackageloaded	177	
\\	71, 197, 244, 297	
\{	242	
\}	243	
_CJKtu_CCT_byte:NNN	114, <u>118</u> , 120	
_CJKtu_UTF_xvi_aux:n	165, 166	
_CJKtu_UTF_xvi_be:n	115, <u>164</u> , 164	
_CJKtu_byte:Nwnw	106, 110	
_CJKtu_byte:wNwnw	100, 104	
_CJKtu_byte:wnn	112, <u>122</u> , 122	
_CJKtu_char_to_unicode:n	<u>91</u> , 93, 190	
_CJKtu_enc_map:nn	43, 48, <u>52</u> , 52, 66	
_CJKtu_encoding_error:	101, 133, 136, 138	
_CJKtu_get_unicode:n	115, 155, <u>162</u> , 162	
_CJKtu_get_unicode:w	85, <u>87</u> , 87, 163	
_CJKtu_get_unicode_aux:w	88, 89	
_CJKtu_identification:n	418, <u>430</u> , 435	
_CJKtu_index_map:n	142, <u>153</u> , 153	
_CJKtu_read_sfd_line:n	<u>296</u>	
_CJKtu_read_sfd_line:nn	<u>296</u>	
_CJKtu_read_sfd_line:nnn	283, 304	
_CJKtu_read_sfd_line:nnnn	308, <u>310</u> , 310	
_CJKtu_read_sfd_line:nwnn	305, 306	
_CJKtu_set_enc:nnnnnn	<u>21</u> , 21, 76, 77, 78, 79, 80, 81	
_CJKtu_sfd_to_unicode:nn	<u>82</u> , 82, 191	
_CJKtu_use_enc_map:n	<u>63</u> , 63, 189	
_CJKtu_write_cmap_body:n	366, <u>381</u> , 381	
_CJKtu_write_cmap_file:n	280, 322, <u>349</u> , 349	
_CJKtu_write_cmap_header:nn	354, <u>461</u> , 461	
_CJKtu_write_cmap_trailer:	378, <u>486</u> , 486	
_CJKtu_write_file:nnn	<u>261</u> , 261, 501	
_CJKtu_write_plane_map:nn	324, <u>337</u> , 337	
_CJKtu_write_sfd_map_header:nn	270, <u>408</u> , 410	
_CJKtu_write_sfd_map_trailer:n	279, <u>450</u> , 450	
_msg_expandable_error:n	139	
A		
\AtBeginDocument	45, 175	
C		
\c_CJKtu_backslash_str	244	
\c_CJKtu_cmd_tl	221, 223, 226	
\c_CJKtu_encoding_seq	11, 23, 72	
\c_CJKtu_hash_str	241, 342, 346, 419, 424	
\c_CJKtu_indent_str	245, 318, 320, 332, 343, 344, 359, 420, 421, 423, 425, 427, 439, 444, 454, 456, 476, 477, 478	
\c_CJKtu_lbrace_str	242, 343, 420, 440, 442, 445, 446, 447	
\c_CJKtu_rbrace_str	243, 320, 427, 440, 442, 445, 446, 447, 456	
\c_CJKtu_sfd_map_prop	<u>254</u> , 254, 255, 256, 257, 258, 259, 260, 500	
\c_CJKtu_sfd_prop	10, 24, 65	
\c_CJKtu_svn_id_str	432, 437	
\c_catcode_other_space_tl	246	
\c_fifteen	401	
\c_job_name_tl	226, 227	
\c_one	30, 34, 37, 158, 207, 298, 300, 362	
\c_one_hundred	372	
\c_two	40, 96	
\c_two_hundred_fifty_six	158, 159, 169, 171	
\c_zero	297, 299	
\CCTchar	113	
\char_set_catcode_active:n	92	
\char_set_catcode_letter:N	202	
\char_set_catcode_other:N	409	
\char_set_catcode_other:n	299, 300	
\char_set_catcode_space:n	431	
\char_set_lccode:nn	297, 298	
\CJK@XX	111	
\CJKaddEncHook	42, 47	
\CJKchar	112	
\CJKchartouni	1, 189, 190	
\JKsfdtouni	1, 189, 191	
\CJKtu_bookmarks_hook:	<u>108</u> , 108, 183	
\CJKtu_byte:NN	97, 111, <u>118</u> , 118	
\CJKtu_byte:nn	113, 119, 121, 122, <u>123</u> , 123	
\CJKtu_byte_map:nn	105, 107, 128, 132, <u>140</u> , 140	
\CJKtu_sfd_map:nn	61, 85, 157	
\cs_generate_variant:Nn	75	
\cs_if_exist:cF	59	
\cs_if_exist_use:cF	422	
\cs_if_exist_use:NF	205, 206	
\cs_if_exist_use:NT	47	
\cs_if_exist_use:NTF	42, 173	
\cs_if_free:NF	180	
\cs_new_eq:NN	189, 190, 191	
\cs_new_nopar:cpn	341, 419	
\cs_new_nopar:Npn	82, 87, 89, 93, 104, 106, 118, 120, 122, 123, 138, 140, 153, 162, 164, 166	
\cs_new_nopar:Npx	435	
\cs_new_protected_nopar:Npn	21, 52, 63, 108, 261, 304, 306, 310, 337, 349, 381, 410, 450, 461	
\cs_new_protected_nopar:Npx	486	
\cs_set_eq:Nc	61	
\cs_set_eq:NN	110, 111, 112, 113, 114, 115	
E		
\else:	214	
\etex_numexpr:D	345	
\exp_args:Nf	142, 165	
\exp_last_unbraced:Nf	84, 163	
\exp_not:N	345, 424, 426	
\exp_stop_f:	90, 139	
\ExplFileDate	445	
\ExplFileDescription	447	
F		
\fi:	214, 319, 455	
\file_input:n	60	
\file_path_include:n	264	

G		
\g_CJKtu_path_str	...	220, 223, 229, 234, 237, 238, 239, 264
\g_CJKtu_sfd_cmap_iow		248, 285, 353, 355, 369, 386, 463, 488
\g_CJKtu_sfd_ior	...	219, 227, 229, 230, 265, 271, 273, 287
\g_CJKtu_sfd_map_iow		247, 269, 286, 316, 330, 339, 412, 452
\GetIdInfo		437
\group_begin:		60, 91, 263, 296, 408, 430
\group_end:		60, 117, 267, 292, 303, 434, 499
H		
\hypersetup		173, 182
\HyPsd@DecimalToOctalFirst		168
\HyPsd@DecimalToOctalSecond		170
I		
\if_case:w		214, 345
\int_case:nnTF		383
\int_compare:nNnF		148, 203, 401
\int_compare:nNnTF		96
\int_compare:nTF		125, 127, 130
\int_const:cn		25, 26, 29, 31, 33, 37, 38, 39
\int_div_truncate:nn		158, 169
\int_eval:n		144, 165, 341, 424
\int_incr:N		406
\int_mod:nn		159, 171, 372
\int_new:N		12, 13, 14, 15, 16, 17, 18, 253
\int_set:Nn		19, 20
\int_set_eq:Nc		54, 55, 56, 57, 58
\int_to_hexadecimal:n		361, 391, 402
\int_zero:N		352
\ior_close:N		230, 287
\ior_get_str:NN		229
\ior_map_break:		272
\ior_map_break:n		277
\ior_new:N		219
\ior_open:NnTF		227, 265
\ior_str_map_inline:Nn		271, 273
\iow_char:N		241, 242, 243, 244
\iow_close:N		285, 286
\iow_new:N		247, 248
\iow_newline:		319, 342, 343, 357, 358, 363, 371, 373, 388, 389, 392, 403, 414, 415, 416, 417, 420, 423, 425, 426, 438, 441, 443, 448, 455, 456, 457, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 490, 491, 492, 493, 494, 495
\iow_now:Nn		488
\iow_now:Nx		316, 330, 339, 355, 369, 386, 412, 452, 463
\iow_open:Nn		269, 353
L		
\l_CJKtu_cmap_block_tl	..	252, 351, 367, 374, 390, 395, 398
\l_CJKtu_gap_begin_int		16, 56, 127, 148, 149
\l_CJKtu_gap_end_int		17, 57, 131, 149
\l_CJKtu_i_max_int		13, 19, 125
\l_CJKtu_i_min_int		12, 54, 125, 146
\l_CJKtu_ii_max_int		15, 20, 30, 34, 40, 131
\l_CJKtu_ii_min_int		14, 55, 127, 147
\l_CJKtu_plane_int		18, 58, 146
\l_CJKtu_sfd_index_int		253, 352, 372, 383, 391, 401, 402, 406
\l_CJKtu_sfd_line_seq		250, 289, 327, 329, 333
\l_CJKtu_sfd_plane_seq		249, 268, 288, 314, 328, 329, 362, 366, 379
\l_CJKtu_sfd_plane_tl		251, 325, 353, 354
\l_CJKtu_sfd_tl		9, 65, 66
\l_tmpa_seq		237, 238, 239
\luatex_if_engine:TF		211, 222
M		
\msg_critical:nn		7
\msg_critical:nnxx		293
\msg_error:nnx		67
\msg_fatal:nnnn		232, 235
\msg_fatal:nnx		209
\msg_new:nnn		5, 69, 187, 195, 200
\msg_warning:nn		178
O		
\or:		89, 90, 333, 334
P		
\PassOptionsToPackage		174
\pdf@pipe		223
\pdf@shellescape		205
\pdfshellescape		206
\pdfstringdefDisableCommands		180, 183
\pdftex_if_engine:F		3
\pdftex_if_engine:TF		213
\pdftex_pdfoutput:D		214
\prop_get:NnNTF		75
\prop_get:NxNTF		65
\prop_gput:Nnn		24, 255, 256, 257, 258, 259, 260
\prop_map_inline:Nn		500
\prop_new:N		10, 254
\ProvidesExplFile		442
Q		
\q_nil		305
\q_stop		88, 89, 305, 307
S		
\s_stop		85, 87, 163
\scan_stop:		346
\seq_clear:N		268, 288, 289, 379
\seq_concat:NNN		328
\seq_count:N		362
\seq_if_empty:NF		314
\seq_map_function:NN		366
\seq_new:N		11, 249, 250
\seq_pop_right:NN		238
\seq_put_right:Nn		23
\seq_set_split:Nnn		327
\seq_set_split:NnV		237
\seq_use:Nn		239, 333
\seq_use:Nnnn		72
\shellescape		206
\str_if_eq:nnT		272
T		
\tex_end:D		502
\tex_immediate:D		225
\tex_romannumeral:D		84, 95
\tex_write:D		225
\tl_clear:N		351, 395
\tl_const:Nn		221
\tl_const:Nx		241, 242, 243, 244, 245, 432
\tl_count:n		96
\tl_gset:Nx		223, 239

