

# xCJK2uni 宏包

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## 1 简介

xCJK2uni 是一个 L<sup>A</sup>T<sub>E</sub>X 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<sup>A</sup>T<sub>E</sub>X 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<sup>A</sup>T<sub>E</sub>X 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

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

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

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

```

```

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

```

\c\_\_CJKtu\_sfd\_map\_prop

```

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

```

\\_\_CJKtu\_write\_file:nnn

```

263 \cs_new_protected_nopar:Npn \__CJKtu_write_file:nnn #1#2#3
264 {
265   \group_begin:
266   \file_path_include:n { \g__CJKtu_path_str / }
267   \ior_open:NnTF \g__CJKtu_sfd_ior { #3.sfd }
268   {
269     \group_end:
270     \seq_clear:N \l__CJKtu_sfd_plane_seq
271     \iow_open:Nn \g__CJKtu_sfd_map_iow { xCJK2uni-#3.def }
272     \__CJKtu_write_sfd_map_header:nn {#1} {#3}
273     \ior_str_map_inline:Nn \g__CJKtu_sfd_ior
274     { \str_if_eq:nnT {##1} { 00 ~ 0x0000_0x00FF } { \ior_map_break: } }
275     \ior_str_map_inline:Nn \g__CJKtu_sfd_ior
276     {
277       \tl_if_blank:nTF {##1}
278       {
279         \ior_map_break:n
280         {
281           \__CJKtu_write_sfd_map_trailer:n {#3}
282           \__CJKtu_write_cmap_file:n {#2}
283         }
284       }
285       { \__CJKtu_read_sfd_line:nnn {##1} {#1} {#2} }
286     }
287     \iow_close:N \g__CJKtu_sfd_cmap_iow
288     \iow_close:N \g__CJKtu_sfd_map_iow
289     \ior_close:N \g__CJKtu_sfd_ior
290     \seq_clear:N \l__CJKtu_sfd_plane_seq
291     \seq_clear:N \l__CJKtu_sfd_line_seq
292   }
293   {

```

```

294         \group_end:
295         \msg_critical:nxxx { xCJK2uni } { file-not-found } {#1} { #3.sfd }
296     }
297 }
(End definition for \_CJKtu_write_file:nnn.)

```

```

\_CJKtu_read_sfd_line:n
\_CJKtu_read_sfd_line:nn
298 \group_begin:
299 \char_set_lccode:nn { \c_zero } { `` }
300 \char_set_lccode:nn { \c_one } { `x }
301 \char_set_catcode_other:n { \c_zero }
302 \char_set_catcode_other:n { \c_one }
303 \tl_to_lowercase:n
304 {
305     \group_end:
306     \cs_new_protected_nopar:Npn \_CJKtu_read_sfd_line:nnn #1#2#3
307     { \_CJKtu_read_sfd_line:nwnn #1 ^^00 \q_nil \q_stop {#2} {#3} }
308     \cs_new_protected_nopar:Npn \_CJKtu_read_sfd_line:nwnn
309     #1 0^^01 #2 ^^00 #3 \q_stop #4#5
310     { \_CJKtu_read_sfd_line:nnnnn {#1} { 0^^01 } {#2} {#4} {#5} }
311 }
(End definition for \_CJKtu_read_sfd_line:n and \_CJKtu_read_sfd_line:nn.)

```

```

\_CJKtu_read_sfd_line:nnnnn
312 \cs_new_protected_nopar:Npn \_CJKtu_read_sfd_line:nnnnn #1#2#3#4#5
313 {
314     \tl_if_blank:nF {#1}
315     {
316         \seq_if_empty:NF \l\_CJKtu_sfd_plane_seq
317         {
318             \iow_now:Nx \g\_CJKtu_sfd_map_iow
319             {
320                 \c\_CJKtu_indent_str \c\_CJKtu_indent_str
321                 \token_to_str:N \fi: \iow_newline:
322                 \c\_CJKtu_indent_str \c\_CJKtu_rbrace_str
323             }
324             \_CJKtu_write_cmap_file:n {#5}
325         }
326         \_CJKtu_write_plane_map:nn {#1} {#4}
327         \tl_set:Nx \l\_CJKtu_sfd_plane_tl { \tl_trim_spaces:n {#1} }
328     }
329     \seq_set_split:Nnn \l\_CJKtu_sfd_line_seq {#2} {#3}
330     \seq_concat:NNN \l\_CJKtu_sfd_plane_seq
331     \l\_CJKtu_sfd_plane_seq \l\_CJKtu_sfd_line_seq
332     \iow_now:Nx \g\_CJKtu_sfd_map_iow
333     {
334         \c\_CJKtu_indent_str \c\_CJKtu_indent_str \c\_CJKtu_indent_str
335         \seq_use:Nn \l\_CJKtu_sfd_line_seq { \or: }
336         \token_to_str:N \or:
337     }
338 }
(End definition for \_CJKtu_read_sfd_line:nnnnn.)

```

```

\_CJKtu_write_plane_map:nn
339 \cs_new_protected_nopar:Npn \_CJKtu_write_plane_map:nn #1#2
340 {
341     \iow_now:Nx \g\_CJKtu_sfd_map_iow
342     {
343         \cs_new_nopar:cpn { ~ \_CJKtu_ #2 _sfd_map_ \int_eval:n {#1} :n ~ } ~
344         \c\_CJKtu_hash_str 1 \iow_newline:
345         \c\_CJKtu_indent_str \c\_CJKtu_lbrace_str \iow_newline:
346         \c\_CJKtu_indent_str \c\_CJKtu_indent_str
347         \exp_not:N \if_case:w \etex_numexpr:D
348         \c\_CJKtu_hash_str 1 ~ \token_to_str:N \scan_stop:
349     }
350 }
(End definition for \_CJKtu_write_plane_map:nn.)

```

```

\__CJKtu_write_cmap_file:n
351 \cs_new_protected_nopar:Npn \__CJKtu_write_cmap_file:n #1
352 {
353   \tl_clear:N \l__CJKtu_cmap_block_tl
354   \int_zero:N \l__CJKtu_sfd_index_int
355   \iow_open:Nn \g__CJKtu_sfd_cmap_iow { c #1 \l__CJKtu_sfd_plane_tl .cmap }
356   \__CJKtu_write_cmap_header:nn { C #1 } { \l__CJKtu_sfd_plane_tl }
357   \iow_now:Nx \g__CJKtu_sfd_cmap_iow
358   {
359     \iow_newline:
360     1~begincodespacerange \iow_newline:
361     \c__CJKtu_indent_str < 00 > ~
362     <
363     \int_to_Hex:n
364     { \seq_count:N \l__CJKtu_sfd_plane_seq - \c_one }
365     > \iow_newline:
366     endcodespacerange
367   }
368   \seq_map_function:NN \l__CJKtu_sfd_plane_seq \__CJKtu_write_cmap_body:n
369   \tl_if_empty:NF \l__CJKtu_cmap_block_tl
370   {
371     \iow_now:Nx \g__CJKtu_sfd_cmap_iow
372     {
373       \iow_newline:
374       \int_mod:nn { \l__CJKtu_sfd_index_int } { \c_one_hundred } ~
375       beginbfchar \iow_newline:
376       \l__CJKtu_cmap_block_tl
377       endbfchar
378     }
379   }
380   \__CJKtu_write_cmap_trailer:
381   \seq_clear:N \l__CJKtu_sfd_plane_seq
382 }

```

(End definition for \\_\_CJKtu\_write\_cmap\_file:n)

\\_\_CJKtu\_write\_cmap\_body:n

```

383 \cs_new_protected_nopar:Npn \__CJKtu_write_cmap_body:n #1
384 {
385   \int_case:nnTF { \l__CJKtu_sfd_index_int }
386   { { 99 } { } { 199 } { } }
387   {
388     \iow_now:Nx \g__CJKtu_sfd_cmap_iow
389     {
390       \iow_newline:
391       100 ~ beginbfchar \iow_newline:
392       \l__CJKtu_cmap_block_tl
393       < \int_to_Hex:n { \l__CJKtu_sfd_index_int } > ~
394       <#1> \iow_newline:
395       endbfchar
396     }
397     \tl_clear:N \l__CJKtu_cmap_block_tl
398   }
399   {
400     \tl_put_right:Nx \l__CJKtu_cmap_block_tl
401     {
402       <
403       \int_compare:nNf \l__CJKtu_sfd_index_int > \c_fifteen { 0 }
404       \int_to_Hex:n { \l__CJKtu_sfd_index_int }
405       > ~ <#1> \iow_newline:
406     }
407   }
408   \int_incr:N \l__CJKtu_sfd_index_int
409 }

```

(End definition for \\_\_CJKtu\_write\_cmap\_body:n)

\\_CJKtu\_write\_sfd\_map\_header:nn

```

410 \group_begin:
411 \char_set_catcode_other:N \%

```



```

412 \cs_new_protected_nopar:Npn \__CJKtu_write_sfd_map_header:nn #1#2
413 {
414   \iow_now:Nx \g__CJKtu_sfd_map_iow
415   {
416     %% \iow_newline:
417     %%~This~is~file~`xCJK2uni-#2.def',\iow_newline:
418     %%~generated~from~file~`#2.sfd'~by~`xCJK2uni-make.ltx'.\iow_newline:
419     %% \iow_newline:
420     \__CJKtu_identification:n { xCJK2uni-#2.def }
421     \cs_new_nopar:cpn { ~ CJKtu_#1_sfd_map:nn ~ } ~ \c__CJKtu_hash_str 1
422     \iow_newline: \c__CJKtu_indent_str \c__CJKtu_lbrace_str \iow_newline:
423     \c__CJKtu_indent_str \c__CJKtu_indent_str
424     \token_to_str:N \cs_if_exist_use:cF
425     \iow_newline: \c__CJKtu_indent_str \c__CJKtu_indent_str \c__CJKtu_indent_str
426     { ~ __CJKtu_#1_sfd_map_ ~ \exp_not:N \int_eval:n { \c__CJKtu_hash_str 1 } ~ :n ~}
427     \iow_newline: \c__CJKtu_indent_str \c__CJKtu_indent_str \c__CJKtu_indent_str
428     { ~ \exp_not:N \use_none:n } \iow_newline:
429     \c__CJKtu_indent_str \c__CJKtu_rbrace_str
430   }
431 }

```

(End definition for \\_\_CJKtu\_write\_sfd\_map\_header:nn.)

\\_\_CJKtu\_identification:n

```

432 \group_begin:
433 \char_set_catcode_space:n { 32 }
434 \tl_const:Nx \c__CJKtu_svn_id_str
435   {\tl_to_str:n {$Id: xCJK2uni.dtx 655 2014-05-12 15:25:37Z sobenlee $}}
436 \group_end:
437 \cs_new_nopar:Npx \__CJKtu_identification:n #1
438 {
439   \token_to_str:N \GetIdInfo \c__CJKtu_svn_id_str
440   \iow_newline:
441   \c__CJKtu_indent_str
442     \c__CJKtu_lbrace_str Convert~CJK~character~to~Unicode. \c__CJKtu_rbrace_str
443   \iow_newline:
444   \token_to_str:N \ProvidesExplFile \c__CJKtu_lbrace_str #1 \c__CJKtu_rbrace_str
445   \iow_newline:
446   \c__CJKtu_indent_str
447     \c__CJKtu_lbrace_str \token_to_str:N \ExplFileDate \c__CJKtu_rbrace_str
448     \c__CJKtu_lbrace_str 0.2 \c__CJKtu_rbrace_str
449     \c__CJKtu_lbrace_str \token_to_str:N \ExplFileDescription \c__CJKtu_rbrace_str
450   \iow_newline:
451 }

```

(End definition for \\_\_CJKtu\_identification:n.)

\\_CJKtu\_write\_sfd\_map\_trailer:n

```

452 \cs_new_protected_nopar:Npn \__CJKtu_write_sfd_map_trailer:n #1
453 {
454   \iow_now:Nx \g__CJKtu_sfd_map_iow
455   {
456     \c__CJKtu_indent_str \c__CJKtu_indent_str
457     \token_to_str:N \fi: \iow_newline:
458     \c__CJKtu_indent_str \c__CJKtu_rbrace_str \iow_newline:
459     %% \iow_newline:
460     %%~End~of~file~`xCJK2uni-#1.def'.
461   }
462 }

```

(End definition for \\_CJKtu\_write\_sfd\_map\_trailer:n.)

\\_CJKtu\_write\_cmap\_header:nn

```

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

```

```

470      %%BeginResource:~CMap~(TeX-#1-#2-0) \iow_newline:
471      %%Title:~(TeX-#1-#2-0~TeX~#1-#2~0) \iow_newline:
472      %%Version:~1.000 \iow_newline:
473      %%EndComments \iow_newline: \iow_newline:
474      /CIDInit~/ProcSet~findresource~begin \iow_newline: \iow_newline:
475      12~dict~begin \iow_newline: \iow_newline:
476      begincmap \iow_newline: \iow_newline:
477      /CIDSystemInfo~3~dict~dup~begin \iow_newline:
478      \c__CJKtu_indent_str /Registry~(TeX)~def \iow_newline:
479      \c__CJKtu_indent_str /Ordering~(#1-#2)~def \iow_newline:
480      \c__CJKtu_indent_str /Supplement~0~def \iow_newline:
481      end~def \iow_newline: \iow_newline:
482      /CMapName~TeX-#1-#2-0~def \iow_newline:
483      /CMapVersion~1.000~def \iow_newline:
484      /CMapType~2~def \iow_newline: \iow_newline:
485      /WMode~0~def
486    }
487  }

```

(End definition for \\_CJKtu\_write\_cmap\_header:nn.)

\\_CJKtu\_write\_cmap\_trailer:

```

488 \cs_new_protected_nopar:Npx \_CJKtu_write_cmap_trailer:
489 {
490   \iow_now:Nn \g__CJKtu_sfd_cmap_iow
491   {
492     \iow_newline:
493     endcmap \iow_newline:
494     CMapName~currentdict~/CMap defineresource~pop \iow_newline:
495     end \iow_newline:
496     end \iow_newline: \iow_newline:
497     %%EndResource \iow_newline:
498     %%EOF
499   }
500 }

```

\group\_end:

(End definition for \\_CJKtu\_write\_cmap\_trailer:.)

```

502 \prop_map_inline:Nn \c__CJKtu_sfd_map_prop
503 { \_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。

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