

xCJK2uni 宏包

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第 1 节 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。

第 2 节 基本命令

`\useCJKencmap` `\useCJKencmap {<Bg5|Bg5+|GB|GBK|JIS|KS>}`

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。

`\CJKchartouni` * `\CJKchartouni {<单个CJK文字>}`

将文字转换成 Unicode。例如 `\CJKchartouni{一}` 将得到 19968。

`\CJKsfdtouni` * `\CJKsfdtouni {<plane>} {<slot>}`

`<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。如果在当前编码下, 该坐标位置不合法, 将展开为空并报错。

第 3 节 代码实现

3.1 xCJK2uni

```
1 <(*package)>
2 <@@=CJKtu>
3 \msg_new:nnn { xCJK2uni } { l3-too-old }
4 {
5   Support~package~'expl3'~too~old. \\\
6   Please~update~an~up~to~date~version~of~the~bundles\\\\
7   'l3kernel'~and~'l3packages'\\\\
8   using~your~TeX~package~manager~or~from~CTAN.
9 }
10 \ifpackagelater { expl3 } { 2020/03/06 } { }
```

*ctex-kit rev. daef005.

```

11 { \msg_error:nn { xCJK2uni } { l3-too-old } }
12 \sys_if_engine_pdftex:F
13 {
14   \msg_new:nnn { xCJK2uni } { pdflatex }
15     { The~xCJK2uni~package~is~only~supported~in~pdfTeX. }
16   \msg_critical:nn { xCJK2uni } { pdflatex }
17 }
18 \tl_new:N \l__CJKtu_sfd_tl
19 \prop_new:N \c__CJKtu_sfd_prop
20 \seq_new:N \c__CJKtu_encoding_seq
21 \int_new:N \l__CJKtu_i_min_int
22 \int_new:N \l__CJKtu_i_max_int
23 \int_new:N \l__CJKtu_ii_min_int
24 \int_new:N \l__CJKtu_ii_max_int
25 \int_new:N \l__CJKtu_gap_begin_int
26 \int_new:N \l__CJKtu_gap_end_int
27 \int_new:N \l__CJKtu_plane_int
28 \int_set:Nn \l__CJKtu_i_max_int { "FE }
29 \int_set:Nn \l__CJKtu_ii_max_int { "FE }
\__CJKtu_set_enc:nnnnn 30 \cs_new_protected:Npn \__CJKtu_set_enc:nnnnn #1#2#3#4#5#6
31 {
32   \seq_gput_right:Nn \c__CJKtu_encoding_seq {#1}
33   \prop_gput:Nnn \c__CJKtu_sfd_prop {#1} {#2}
34   \int_const:cn { c__CJKtu_ #1 _i_min_int } {#3}
35   \int_const:cn { c__CJKtu_ #1 _ii_min_int } {#4}
36   \tl_if_empty:nTF {#5}
37     {
38       \int_const:cn { c__CJKtu_ #1 _gap_begin_int }
39         { \l__CJKtu_ii_max_int + 1 }
40       \int_const:cn { c__CJKtu_ #1 _gap_end_int }
41         { \use:c { c__CJKtu_ #1 _gap_begin_int } }
42       \int_const:cn { c__CJKtu_ #1 _plane_int }
43         { \l__CJKtu_ii_max_int - (#4) + 1 }
44     }
45     {
46       \int_const:cn { c__CJKtu_ #1 _gap_begin_int } { #5 + 1 }
47       \int_const:cn { c__CJKtu_ #1 _gap_end_int } {#6}
48       \int_const:cn { c__CJKtu_ #1 _plane_int }
49         { (#5) - (#4) + \l__CJKtu_ii_max_int - (#6) + 2 }
50     }
51   \cs_if_exist_use:NTF \CJKaddEncHook
52     { {#1} { \__CJKtu_enc_map:nn {#1} {#2} } }
53     {
54       \AtBeginDocument
55         {
56           \cs_if_exist_use:NT \CJKaddEncHook
57             { {#1} { \__CJKtu_enc_map:nn {#1} {#2} } }
58         }
59     }
60 }
\__CJKtu_enc_map:nn 61 \cs_new_protected:Npn \__CJKtu_enc_map:nn #1#2
62 {
63   \int_set_eq:Nc \l__CJKtu_i_min_int { c__CJKtu_ #1 _i_min_int }
64   \int_set_eq:Nc \l__CJKtu_ii_min_int { c__CJKtu_ #1 _ii_min_int }
65   \int_set_eq:Nc \l__CJKtu_gap_begin_int { c__CJKtu_ #1 _gap_begin_int }
66   \int_set_eq:Nc \l__CJKtu_gap_end_int { c__CJKtu_ #1 _gap_end_int }
67   \int_set_eq:Nc \l__CJKtu_plane_int { c__CJKtu_ #1 _plane_int }
68   \cs_if_exist:cF { CJKtu_ #1 _index_map:n }
69     { \__CJKtu_input_sfd_map:n {#2} }
70   \cs_set_eq:Nc \__CJKtu_index_map:n { CJKtu_ #1 _index_map:n }
71 }
72 \cs_new_protected:Npn \__CJKtu_input_sfd_map:n #1
73 {
74   \group_begin:
75     \ExplSyntaxOn
76     \file_input:n { xCJK2uni-#1.def }

```

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77     \group_end:
78 }

\CJKtu_index_map:n 79 \cs_new:Npn \CJKtu_index_map:n #1
80 { \CJKtu_unicode:n { \__CJKtu_index_map:n {#1} } }
81 \cs_new_eq:NN \CJKtu_unicode:n \use:n
82 \cs_new_eq:NN \__CJKtu_index_map:n \use_none:n

\CJKtu_index_map:nn 83 \cs_new_protected:Npn \CJKtu_index_map:nn #1
84 {
85     \exp_args:Ncc \__CJKtu_index_map_aux:NNn
86     { CJKtu_ #1 _index_map:n } { c__CJKtu_ #1 _intarray }
87 }
88 \cs_new_protected:Npn \__CJKtu_index_map_aux:NNn #1#2
89 {
90     \cs_new:Npn #1 ##1 { \intarray_item:Nn #2 { ##1 + 1 } }
91     \intarray_const_from_clist:Nn #2
92 }

\CJKtu_sfd_map:nn 93 \cs_new:Npn \CJKtu_sfd_map:nn #1#2
94 { \CJKtu_index_map:n { ( #1 - 1 ) * 256 + ( #2 ) } }

\CJKtu_use_enc_map:n 95 \cs_new_protected:Npn \CJKtu_use_enc_map:n #1
96 {
97     \prop_get:NnNTF \c__CJKtu_sfd_prop {#1} \l__CJKtu_sfd_tl
98     { \__CJKtu_enc_map:nn {#1} { \l__CJKtu_sfd_tl } }
99     { \msg_error:nnx { xCJK2uni } { invalid-encoding } {#1} }
100 }
101 \msg_new:nnn { xCJK2uni } { invalid-encoding }
102 {
103     The~encoding~`#1'~is~invalid.\\
104     Only~\seq_use:Nnnn \c__CJKtu_encoding_seq { ~and~ } { ,~ } { ,~and~ } ~
105     are~supported.
106 }
107 \cs_generate_variant:Nn \CJKtu_use_enc_map:n { x }

108 \__CJKtu_set_enc:nnnnn { GB } { UGB } { "A1 } { "A1 } { } { }
109 \__CJKtu_set_enc:nnnnn { JIS } { UJIS } { "A1 } { "A1 } { } { }
110 \__CJKtu_set_enc:nnnnn { KS } { UKS } { "A1 } { "A1 } { } { }
111 \__CJKtu_set_enc:nnnnn { Bg5 } { UBig5 } { "A1 } { "40 } { "7E } { "A1 }
112 \__CJKtu_set_enc:nnnnn { Bg5+ } { UBg5plus } { "81 } { "40 } { "7E } { "80 }
113 \__CJKtu_set_enc:nnnnn { GBK } { UGBK } { "81 } { "40 } { "7E } { "80 }

\CJKtu_char_to_unicode:n 114 \group_begin:
115 \char_set_catcode_active:n { "7F }
116 \cs_new:Npn \CJKtu_char_to_unicode:n #1
117 {
118     \int_compare:nNnTF { \tl_count:n {#1} } = 2
119     { \CJKtu_byte:NN #1 }
120     {
121         \tl_if_head_eq_meaning:nNTF {#1} ^^7f
122         { \__CJKtu_byte:wNwn #1 }
123         { \__CJKtu_encoding_error: }
124     }
125 }
126 \cs_new:Npn \__CJKtu_byte:wNwn ^^7f #1 ^^7f #2 ^^7f
127 { \CJKtu_byte_map:nn { `#1 } {#2} }
128 \cs_new:Npn \__CJKtu_active_byte:Nwn #1 ^^7f #2 ^^7f
129 { \CJKtu_byte_map:nn { `#1 } {#2} }

\CJKtu_bookmarks_hook: 130 \cs_new_protected:Npn \CJKtu_bookmarks_hook:
131 {
132     \cs_set_eq:NN ^^7f \__CJKtu_active_byte:Nwn
133     \cs_set_eq:NN \CJK@XX \CJKtu_byte:NN
134     \cs_set_eq:NN \CJKchar \__CJKtu_byte:wnn
135     \cs_set_eq:NN \CCTchar \CJKtu_byte:nn
136     \cs_set_eq:NN \@CCTSetChar \__CJKtu_CCT_byte:NNN
137     \cs_set_eq:NN \CJKtu_unicode:n \__CJKtu_UTF_xvi_be_octal:n
138 }

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139 \group_end:

\CJKtu_byte:NN 140 \cs_new:Npn \CJKtu_byte:NN #1#2
\__CJKtu_CCT_byte:NNN 141 { \CJKtu_byte:nn { `#1 } { `#2 } }
142 \cs_new:Npn \__CJKtu_CCT_byte:NNN #1#2#3
143 { \CJKtu_byte:nn { `#1 } { `#3 } }

\__CJKtu_byte:wnn 144 \cs_new:Npn \__CJKtu_byte:wnn #1# { \CJKtu_byte:nn }

\CJKtu_byte:nn 145 \cs_new:Npn \CJKtu_byte:nn #1#2
146 {
147   \int_compare:nTF { \l__CJKtu_i_min_int <= #1 <= \l__CJKtu_i_max_int }
148   {
149     \int_compare:nTF { \l__CJKtu_ii_min_int <= #2 < \l__CJKtu_gap_begin_int }
150     { \CJKtu_byte_map:nn {#1} {#2} }
151     {
152       \int_compare:nTF
153       { \l__CJKtu_gap_end_int <= #2 <= \l__CJKtu_ii_max_int }
154       { \CJKtu_byte_map:nn {#1} {#2} }
155       { \__CJKtu_encoding_error: }
156     }
157   }
158   { \__CJKtu_encoding_error: }
159 }
160 \cs_new:Npn \__CJKtu_encoding_error:
161 { \msg_expandable_error:nn { xCJK2uni } { encoding-error } }
162 \msg_new:nnn { xCJK2uni } { encoding-error }
163 { Wrong~encoding~scheme. }

\CJKtu_byte_map:nn 164 \cs_new:Npn \CJKtu_byte_map:nn #1#2
165 {
166   \exp_args:Nf \CJKtu_index_map:n
167   {
168     \int_eval:n
169     {
170       ( #1 - \l__CJKtu_i_min_int ) * \l__CJKtu_plane_int
171       + (#2) - \l__CJKtu_ii_min_int
172       \int_compare:nNf {#2} < \l__CJKtu_gap_begin_int
173       { + \l__CJKtu_gap_begin_int - \l__CJKtu_gap_end_int }
174     }
175   }
176 }

\__CJKtu_UTF_xvi_be_octal:n 177 \cs_new:Npn \__CJKtu_UTF_xvi_be_octal:n #1
178 { \exp_args:Nf \__CJKtu_UTF_xvi_be_octal_aux:n { \int_eval:n {#1} } }
179 \cs_new:Npn \__CJKtu_UTF_xvi_be_octal_aux:n #1
180 {
181   \__CJKtu_UTF_xvi_be_octal:nn
182   { \int_div_truncate:nn {#1} { 256 } }
183   { \int_mod:nn {#1} { 256 } }
184 }
185 \cs_new:Npn \__CJKtu_UTF_xvi_be_octal:nn #1#2
186 {
187   \HyPsd@DecimalToOctalFirst {#1}
188   \HyPsd@DecimalToOctalSecond {#2}
189 }

190 \cs_if_exist_use:NTF \hypersetup { { unicode , CJKbookmarks = false } }
191 { \PassOptionsToPackage { unicode , CJKbookmarks = false } { hyperref } }
192 \msg_new:nnn { xCJK2uni } { UTF-8-encoding }
193 { It~is~not~necessary~to~load~xCJK2uni~in~UTF-8~encoding. }
194 \tl_if_exist:Nf \pdfstringdefPreHook { \tl_new:N \pdfstringdefPreHook }
195 \ifpackageloaded { CJKutf8 }
196 { \msg_warning:nn { xCJK2uni } { UTF-8-encoding } }
197 {
198   \cs_new_eq:NN \CJKtu@bookmarks@hook \CJKtu_bookmarks_hook:
199   \tl_gput_right:Nn \pdfstringdefPreHook { \CJKtu@bookmarks@hook }
200   \AtBeginDocument

```

```

201     {
202     \@ifpackageloaded { CJKutf8 }
203     {
204     \cs_gset_eq:NN \CJKtu@bookmarks@hook \scan_stop:
205     \msg_warning:nn { xCJK2uni } { UTF-8-encoding }
206     }
207     { \cs_if_exist_use:NT \hypersetup { { CJKbookmarks = false } } }
208     }
209   }
\useCJKencmap 210 \cs_new_eq:NN \useCJKencmap \CJKtu_use_enc_map:x
\CJKchartouni 211 \cs_new_eq:NN \CJKchartouni \CJKtu_char_to_unicode:n
\CJKsfdtouni 212 \cs_new_eq:NN \CJKsfdtouni \CJKtu_sfd_map:nn
__CJKtu_initial:N 213 \cs_new_protected:Npn __CJKtu_initial:N #1
214   {
215     \tl_if_exist:NTF #1
216     {
217       \prop_get:NxNTF \c__CJKtu_sfd_prop {#1} \l__CJKtu_sfd_tl
218       { \__CJKtu_enc_map:nn {#1} { \l__CJKtu_sfd_tl } }
219       { \CJKtu_use_enc_map:n { GBK } }
220     }
221     { \CJKtu_use_enc_map:n { GBK } }
222   }
223 \prg_generate_conditional_variant:Nnn \prop_get:NnN { Nx } { TF }
224 \group_begin: \exp_args:NNc \group_end:
225 \__CJKtu_initial:N { CJK @ @ @ enc }
226 </package>

```

3.2 xCJK2uni-make

```

227 <*make>
228 \msg_new:nnn { xCJK2uni } { file-not-found }
229 {
230   SFD file~`#2'~for~encoding~`#1'~not~found.\\
231   xCJK2uni~will~not~work!
232 }
233 \ior_new:N \g__CJKtu_sfd_ior
234 \str_new:N \g__CJKtu_path_str
235 \sys_if_engine luatex:TF
236 {
237   \str_gset:Nx \g__CJKtu_path_str
238   {
239     \lua_now:e
240     {
241       kpse.set_program_name("luatex") ~
242       local ~ sfd = kpse.find_file("UGBK.sfd", "subfont~definition~files") ~
243       if ~ sfd ~ then ~
244         tex.write(sfd) ~
245       end
246     }
247   }
248 }
249 {
250   \sys_get_shell:nnNTF { kpsewhich ~ UGBK.sfd } { } \l_tmpa_str
251   { \str_gset_eq:NN \g__CJKtu_path_str \l_tmpa_str }
252   { \msg_fatal:nmmm { xCJK2uni } { file-not-found } { GBK } { UGBK.sfd } }
253 }
254 \tl_if_blank:oTF { \g__CJKtu_path_str }
255 { \msg_fatal:nmmm { xCJK2uni } { file-not-found } { GBK } { UGBK.sfd } }
256 {
257   \exp_args:No \file_parse_full_name:nNNN { \g__CJKtu_path_str }
258   \l_tmpa_str \l_tmpb_str \l_tmpc_str
259   \str_gset_eq:NN \g__CJKtu_path_str \l_tmpa_str
260 }
261 \str_const:Nx \c__CJKtu_indent_str
262 { \c_catcode_other_space_tl \c_catcode_other_space_tl }

```

```

263 \iow_new:N \g__CJKtu_sfd_map_iow
264 \iow_new:N \g__CJKtu_sfd_cmap_iow
265 \seq_new:N \l__CJKtu_sfd_plane_seq
266 \seq_new:N \l__CJKtu_sfd_line_seq
267 \tl_new:N \l__CJKtu_sfd_plane_tl
268 \tl_new:N \l__CJKtu_cmap_block_tl
269 \int_new:N \l__CJKtu_sfd_index_int

\c__CJKtu_sfd_map_prop 270 \prop_const_from_keyval:Nn \c__CJKtu_sfd_map_prop
271 {
272   GB = { 10 } { UGB } ,
273   JIS = { 40 } { UJIS } ,
274   KS = { 60 } { UKS } ,
275   Bg5 = { 00 } { UBig5 } ,
276   Bg5+ = { 09 } { UBg5plus } ,
277   GBK = { 19 } { UGBK }
278 }

\__CJKtu_write_file:nnn 279 \cs_new_protected:Npn \__CJKtu_write_file:nnn #1#2#3
280 {
281   \group_begin:
282   \seq_put_right:No \l_file_search_path_seq { \g__CJKtu_path_str }
283   \ior_open:NnTF \g__CJKtu_sfd_ior { #3.sfd }
284   {
285     \group_end:
286     \seq_clear:N \l__CJKtu_sfd_plane_seq
287     \__CJKtu_write_sfd_map_header:n {#1}
288     \ior_str_map_inline:Nn \g__CJKtu_sfd_ior
289     { \str_if_eq:nnT { ##1 } { 00 ~ 0x0000_0x00FF } { \ior_map_break: } }
290     \ior_str_map_inline:Nn \g__CJKtu_sfd_ior
291     {
292       \tl_if_blank:nT { ##1 } { \ior_map_break: }
293       \__CJKtu_read_sfd_line:nn { ##1 } {#2}
294     }
295     \__CJKtu_write_sfd_map_trailer:n {#1}
296     \__CJKtu_write_cmap_file:n {#2}
297     \iow_close:N \g__CJKtu_sfd_cmap_iow
298     \ior_close:N \g__CJKtu_sfd_ior
299     \seq_clear:N \l__CJKtu_sfd_plane_seq
300     \seq_clear:N \l__CJKtu_sfd_line_seq
301   }
302   {
303     \group_end:
304     \msg_critical:nxxx { xCJK2uni } { file-not-found } {#1} { #3.sfd }
305   }
306 }

\__CJKtu_read_sfd_line:n 307 \cs_new_protected:Npx \__CJKtu_read_sfd_line:nn #1
\__CJKtu_read_sfd_line:nn 308 {
309   \exp_not:N \__CJKtu_read_sfd_line:nwn #1
310   \c_backslash_str \exp_not:N \q_nil \exp_not:N \q_stop
311 }
312 \use:e
313 {
314   \cs_new_protected:Npn \exp_not:N \__CJKtu_read_sfd_line:nwn
315   #1 0 \token_to_str:N x #2 \c_backslash_str #3 \exp_not:N \q_stop
316   {
317     \exp_not:N \__CJKtu_read_sfd_line:nnnn
318     {#1} { 0 \token_to_str:N x } {#2}
319   }
320 }

\__CJKtu_read_sfd_line:nnnn 321 \cs_new_protected:Npn \__CJKtu_read_sfd_line:nnnn #1#2#3#4
322 {
323   \tl_if_blank:nF {#1}
324   {
325     \seq_if_empty:NF \l__CJKtu_sfd_plane_seq
326     { \__CJKtu_write_cmap_file:n {#4} }
327     \tl_set:Nx \l__CJKtu_sfd_plane_tl { \tl_trim_spaces:n {#1} }

```

```

328     \__CJktu_write_plane_map:n { \l__CJktu_sfd_plane_tl }
329   }
330   \seq_set_split:Nnn \l__CJktu_sfd_line_seq {#2} {#3}
331   \seq_concat:NNN \l__CJktu_sfd_plane_seq
332     \l__CJktu_sfd_plane_seq \l__CJktu_sfd_line_seq
333   \iow_now:Nx \g__CJktu_sfd_map_iow
334   {
335     \c__CJktu_indent_str \c__CJktu_indent_str
336     " \seq_use:Nn \l__CJktu_sfd_line_seq { ~ , ~ " } ~ ,
337   }
338 }

\__CJktu_write_cmap_file:n 339 \cs_new_protected:Npn \__CJktu_write_cmap_file:n #1
340 {
341   \tl_clear:N \l__CJktu_cmap_block_tl
342   \int_zero:N \l__CJktu_sfd_index_int
343   \iow_open:Nn \g__CJktu_sfd_cmap_iow { c #1 \l__CJktu_sfd_plane_tl .cmap }
344   \__CJktu_write_cmap_header:nn { C #1 } { \l__CJktu_sfd_plane_tl }
345   \iow_now:Nx \g__CJktu_sfd_cmap_iow
346   {
347                                     \iow_newline:
348     1~begincodespacerrange           \iow_newline:
349     \c__CJktu_indent_str < 00 > ~
350     <
351     \int_to_Hex:n
352       { \seq_count:N \l__CJktu_sfd_plane_seq - 1 }
353     >                                     \iow_newline:
354     endcodespacerrange
355   }
356   \seq_map_function:NN \l__CJktu_sfd_plane_seq \__CJktu_write_cmap_body:n
357   \tl_if_empty:NF \l__CJktu_cmap_block_tl
358   {
359     \iow_now:Nx \g__CJktu_sfd_cmap_iow
360     {
361                                     \iow_newline:
362       \int_mod:nn { \l__CJktu_sfd_index_int } { 100 } ~
363       beginbfchar                       \iow_newline:
364       \l__CJktu_cmap_block_tl
365       endbfchar
366     }
367   }
368   \__CJktu_write_cmap_trailer:
369   \seq_clear:N \l__CJktu_sfd_plane_seq
370 }

\__CJktu_write_cmap_body:n 371 \cs_new_protected:Npn \__CJktu_write_cmap_body:n #1
372 {
373   \int_case:nnTF { \l__CJktu_sfd_index_int }
374   { { 99 } { } { 199 } { } }
375   {
376     \iow_now:Nx \g__CJktu_sfd_cmap_iow
377     {
378                                     \iow_newline:
379       100 ~ beginbfchar                 \iow_newline:
380       \l__CJktu_cmap_block_tl
381       < \int_to_Hex:n { \l__CJktu_sfd_index_int } > ~
382       <#1>                               \iow_newline:
383       endbfchar
384     }
385     \tl_clear:N \l__CJktu_cmap_block_tl
386   }
387   {
388     \tl_put_right:Nx \l__CJktu_cmap_block_tl
389     {
390       <
391       \int_compare:nNnF \l__CJktu_sfd_index_int > { 15 } { 0 }
392       \int_to_Hex:n { \l__CJktu_sfd_index_int }
393     > ~ <#1>                               \iow_newline:

```

```

394     }
395   }
396   \int_incr:N \l__CJKtu_sfd_index_int
397 }

\__CJKtu_write_sfd_map_header:n 398 \group_begin:
399 \char_set_catcode_other:N \%
400 \cs_new_protected:Npn \__CJKtu_write_sfd_map_header:n #1
401 {
402   \iow_now:Nx \g__CJKtu_sfd_map_iow
403   {
404     %<#1> \iow_newline:
405     \exp_not:N \CJKtu_index_map:nn { ~ #1 ~ } \iow_newline:
406     \__CJKtu_indent_str \c_left_brace_str
407   }
408 }

\__CJKtu_write_sfd_map_trailer:n 409 \cs_new_protected:Npn \__CJKtu_write_sfd_map_trailer:n #1
410 {
411   \iow_now:Nx \g__CJKtu_sfd_map_iow
412   {
413     \__CJKtu_indent_str \c_right_brace_str \iow_newline:
414     %</#1>
415   }
416 }

\__CJKtu_write_plane_map:n 417 \cs_new_protected:Npn \__CJKtu_write_plane_map:n #1
418 {
419   \iow_now:Nx \g__CJKtu_sfd_map_iow
420   { %% ~ <#1> }
421 }

\__CJKtu_write_cmap_header:nn 422 \cs_new_protected:Npn \__CJKtu_write_cmap_header:nn #1#2
423 {
424   \iow_now:Nx \g__CJKtu_sfd_cmap_iow
425   {
426     %!PS-Adobe-3.0~Resource-CMap \iow_newline:
427     %DocumentNeededResources:~ProcSet~(CIDInit) \iow_newline:
428     %IncludeResource:~ProcSet~(CIDInit) \iow_newline:
429     %BeginResource:~CMap~(TeX-#1-#2-0) \iow_newline:
430     %%Title:~(TeX-#1-#2-0~TeX~#1-#2~0) \iow_newline:
431     %%Version:~1.000 \iow_newline:
432     %%EndComments \iow_newline: \iow_newline:
433     /CIDInit~/ProcSet~findresource~begin \iow_newline: \iow_newline:
434     12~dict~begin \iow_newline: \iow_newline:
435     begincmap \iow_newline: \iow_newline:
436     /CIDSystemInfo~3~dict~dup~begin \iow_newline:
437     \__CJKtu_indent_str /Registry~(TeX)~def \iow_newline:
438     \__CJKtu_indent_str /Ordering~(#1-#2)~def \iow_newline:
439     \__CJKtu_indent_str /Supplement~0~def \iow_newline:
440     end~def \iow_newline: \iow_newline:
441     /CMapName~/TeX-#1-#2-0~def \iow_newline:
442     /CMapVersion~1.000~def \iow_newline:
443     /CMapType~2~def \iow_newline: \iow_newline:
444     /WMode~0~def
445   }
446 }

\__CJKtu_write_cmap_trailer: 447 \cs_new_protected:Npx \__CJKtu_write_cmap_trailer:
448 {
449   \iow_now:Nn \g__CJKtu_sfd_cmap_iow
450   {
451     \iow_newline:
452     endcmap \iow_newline:
453     CMapName~currentdict~/CMap~defineresource~pop \iow_newline:
454     end \iow_newline:
455     end \iow_newline: \iow_newline:
456     %%EndResource \iow_newline:

```



```
457         %%EOF
458     }
459 }
460 \group_end:

461 \iow_open:Nn \g__CJktu_sfd_map_iow { xCJK2uni-sfd.def }
462 \prop_map_inline:Nn \c__CJktu_sfd_map_prop
463   { \__CJktu_write_file:nnn {#1} #2 }
464 \iow_close:N \g__CJktu_sfd_map_iow
465 \cs_if_exist_use:NF \CJKtuend { \tex_end:D }
466 </make>
```

代码索引

意大利体的数字表示描述对应索引项的页码;带下划线的数字表示定义对应索引项的代码行号;罗马字体的数字表示使用对应索引项的代码行号。

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