

xpinyin 宏包

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1 简介

xpinyin 是一个 \LaTeX 宏包, 提供了为汉字自动注音的功能。

2 基本用法

xpinyin 支持采用 GBK 和 UTF-8 编码的 \TeX 源文件, 建议总是使用 UTF-8。如果使用 \LaTeX 或 \pdfLaTeX 的编译方式, 则根据编码的情况, xpinyin 依赖 CJK 或者 CJKutf8 宏包。如果使用 \XeLaTeX , 则依赖 xeCJK 宏包。如果它们没有在 xpinyin 之前被载入, xpinyin 将根据编译方式自动选择, \LaTeX 或 \pdfLaTeX 将使用 CJKutf8。

xpinyin 还依赖 l3kernel 和 l3packages, 使用 (pdf) \LaTeX 下的 GBK 编码时, 还将依赖 xCJK2uni。

需要注意的是, xpinyin 缺省将拼音的字体设置为与文档的主字体(\normalfont)相同, 所以为了保证声调字母的正确输出, 应该选用合适的西文主字体。也可以通过将在下一节介绍的 $\langle font \rangle$ 选项来单独设置拼音的字体。

\XeLaTeX 下的简单示例:

```
\documentclass{article}
\usepackage{xeCJK}
\usepackage{xpinyin}
\setmainfont{CMU Serif}
\setCJKmainfont{SimSun}

\begin{document}
\xpinyin*{汉语拼音示例}
\end{document}
```

(pdf) \LaTeX 下的简单示例:

```
\documentclass{article}
\usepackage{CJKutf8}
\usepackage{xpinyin}
\usepackage[T1]{fontenc}
\usepackage{lmodern}

\begin{document}
\begin{CJK}{UTF8}{gbsn}
\xpinyin*{汉语拼音示例}
\end{CJK}
\end{document}
```

运行上述示例要求系统安装了设置的字体, 源文件用 UTF-8 编码保存, 使用相应的编译方式。xpinyin 可以与 ctex 宏包或文档类共同使用, 使用方式与上面类似。

3 用户手册

\pinyin scope $\text{\begin{pinyin}}[options]$
.....
 $\text{\end{pinyin}}$

为 \pinyin scope 环境中的汉字自动注音。例如

```
1 \begin{pinyin}
2 列位看官：你道此书从何而来？说起根由，虽近荒唐，细按则深有趣味。
3 待在下将此来历注明，方使阅者\xpinyin{了}{liao3}然不惑。
4 \end{pinyin}
```

liè wèi kàn guān nǐ dào cǐ shū cóng hé ér lái shuō qǐ gēn yóu suī jìn huāng táng xì àn zé shēn yǒu qù wèi dài zài xià jiāng cǐ lái lì zhù míng fāng shǐ
列位看官：你道此书从何而来？说起根由，虽近荒唐，细按则深有趣味。待在下将此来历注明，方使
yuè zhè liǎo rán bù huò
阅者了然不惑。

可选项 $\langle options \rangle$ 用于局部设置拼音的格式,将在下面说明。

\xpinyin $\langle options \rangle$ {<单个汉字>} {<拼音>}
\xpinyin* $\langle options \rangle$ {<文字>}

对于多音字,可以使用 **\xpinyin** 为其设置拼音;而 **\xpinyin*** 相当于 **pinyin**scope 环境的命令形式。**\xpinyin** 可以在 **pinyin**scope 环境和 **\xpinyin*** 中使用。例如,

长
甄士隐梦幻识通灵
重要

```
1 \xpinyin{长}{chang2}\  
2 \xpinyin*{甄士隐梦幻识通灵}\  
3 \xpinyin*{\xpinyin{重}{zhong4}}要
```

\pinyin $\langle options \rangle$ {<拼音>}

用于输出拼音,为了输入的方便 ü 可以用 v 代替。例如,

lǚ zi
nǚ hái zi

```
1 \pinyin{lv2zi}\  
2 \pinyin{nv3hai2zi}
```

\setpinyin $\langle options \rangle$ {<汉字>} {<拼音>}

xpinyin 宏包的拼音数据(**xpinyin-map.cfg**)来源于 Unicode 6.1.0 的 UniHan 数据库¹中的 UniHan_Readings.txt 文件。对于多音字,一般来说这个文件选用的是常用读音。可以使用 **\setpinyin** 来设置多音字的首选读音。

\xpinyinsetup {<key₁>=<var₁>, <key₂>=<var₂>, ...}

用于在导言区或文档中,设置拼音的格式。目前可以设置的 $\langle key \rangle$ 如下介绍。

ratio **ratio** = {<number>}

设置拼音字体大小与当前正文字体大小的比例,缺省值是 0.4。

vsep **vsep** = {<dimen>}

设置拼音的基线与汉字基线的间距,缺省值是 1 em。

hsep **hsep** = {<skip>}

设置注音汉字之间的间距,缺省值与 **\CJKglue** 的值相同。为了断行时行末的对齐,设置的 $\langle skip \rangle$ 最后有一定的弹性。例如

```
1 \xpinyin*[ratio={.7},hsep={.5em plus .1em},vsep={1.1em}]{贾雨村风尘怀闺秀}
```

jiǎ yǔ cūn fēng chén huái guī xiù
贾雨村风尘怀闺秀

pysep **pysep** = {<glue>}

设置 **\pinyin** 输出的相邻两个汉语拼音的空白,缺省值是一个空格。

font **font** = {}

设置拼音的字体,缺省值是 **\normalfont**,即以正文西文字体相同。为了保证拼音能正确输出,最好选用收字量较大的西文字体。

format **format** = {<format>}

设置拼音的其它格式,例如颜色等,缺省值为空。

multiple **multiple** = {<format>}

设置多音字拼音的其它格式,缺省值为空。可以通过这个选项来提醒校正多音字的拼音。例如本文档设置多音字拼音的颜色是红色(需要载入 **color** 宏包):

```
\xpinyinsetup{multiple={\color{red}}}
```

¹<http://www.unicode.org/Public/UNIDATA/UniHan.zip>

4 代码实现

```
1 <*package>
2 <@@=xpinyin>
3 \msg_new:nnn { xpinyin } { no-LuaTeX }
4 {
5   The~xpinyin~package~is~not~supported~in~LuaTeX.\\
6   You~must~change~your~typesetting~engine~to\\
7   "xelatex"~or~"pdflatex"~or~"latex"~instead~of~"lualatex".
8 }
9 \luatex_if_engine:T { \msg_critical:nn { xpinyin } { no-LuaTeX } }
10 \RequirePackage{xparse}
11 \RequirePackage{l3keys2e}

\c__xpinyin_tone_prop
12 \prop_new:N \c__xpinyin_tone_prop
13 \clist_map_inline:nn
14 {
15   { ā }{ \= a } , { á }{ \' a } , { ä }{ \v a } , { â }{ \` a } ,
16   { õ }{ \= o } , { ô }{ \' o } , { ö }{ \v o } , { ò }{ \` o } ,
17   { ē }{ \= e } , { é }{ \' e } , { ë }{ \v e } , { è }{ \` e } ,
18   { ī }{ \= i } , { í }{ \' i } , { ï }{ \v i } , { ì }{ \` i } ,
19   { ū }{ \= u } , { ú }{ \' u } , { ü }{ \v u } , { ù }{ \` u } ,
20   { ṁ }{ \' m } , { ṇ }{ \' n } , { ñ }{ \v n } , { ñ }{ \` n } ,
21   { ü }{ \" u } ,
22   { ũ }{ \= { \" u } } , { ŷ }{ \' { \" u } } ,
23   { Ź }{ \v { \" u } } , { ŷ }{ \` { \" u } }
24 }
25 { \prop_gput:Nnn \c__xpinyin_tone_prop #1 }
(End definition for \c__xpinyin_tone_prop.)

\__xpinyin_UTF_char:nn
26 \cs_new_protected_nopar:Npn \__xpinyin_UTF_char:nn #1#2
27 {
28   \cs_if_exist:cF { u8:#1 }
29   { \cs_new_protected_nopar:cpn { u8:#1 } {#2} }
30 }
(End definition for \__xpinyin_UTF_char:nn.)

\__xpinyin_GBK_char:nn
31 \cs_new_protected_nopar:Npn \__xpinyin_GBK_char:nn #1#2
32 {
33   \__xpinyin_UTF_char:nn {#1} {#2}
34   \exp_args:Nx \__xpinyin_GBK_char_aux:nn { \tl_head:n {#1} } {#1}
35 }
36 \cs_new_protected_nopar:Npn \__xpinyin_GBK_char_aux:nn #1#2
37 { \exp_args:Nf \__xpinyin_GBK_char_aux:nnn { \int_eval:n { `#1 } } {#1} {#2} }
38 \cs_new_protected_nopar:Npn \__xpinyin_GBK_char_aux:nnn #1#2#3
39 {
40   \cs_if_exist:cF { __xpinyin_UTF_ #1 :w }
41   {
42     \exp_args:Nf \__xpinyin_GBK_char_def:nnn
43     {
44       \int_case:nn { \tl_count:n {#3} }
45       {
46         { \c_two } { ##1 }
47         { \c_three } { ##1##2 }
48         { \c_four } { ##1##2##3 }
49       }
50     }
51     {#1} {#2}
52     \exp_args:Nc \__xpinyin_save_UTF_cs:Nn { __xpinyin_UTF_ #1 :w } {#1}
53     \tl_gput_right:Nx \c__xpinyin_reset_UTF_catcode_tl
54     { \char_set_catcode:nn {#1} { \char_value_catcode:n {#1} } }
55     \char_set_catcode_active:n {#1}
56   }
57 }
```

```

58 \cs_new_protected_nopar:Npn \__xpin_yin_GBK_char_def:nnn #1#2#3
59 {
60   \cs_new_protected_nopar:cpn { \__xpin_yin_UTF_ #2 :w } #1
61   { \use:c { u8: \tl_to_str:n { #3#1 } } }
62 }
63 \tl_new:N \c__xpin_yin_reset_UTF_catcode_tl
(End definition for \__xpin_yin_GBK_char:nn.)

```

__xpin_yin_save_UTF_cs:Nn

```

64 \group_begin:
65 \char_set_catcode_active:n { \c_zero }
66 \cs_new_protected_nopar:Npn \__xpin_yin_save_UTF_cs:Nn #1#2
67 {
68   \group_begin:
69   \char_set_lccode:nn { \c_zero } {#2}
70   \tl_to_lowercase:n
71   {
72     \group_end:
73     \tl_gput_right:Nn \c__xpin_yin_reset_UTF_cs_tl { \cs_set_eq:NN ^~00 #1 }
74   }
75 }
76 \group_end:
77 \tl_new:N \c__xpin_yin_reset_UTF_cs_tl
(End definition for \__xpin_yin_save_UTF_cs:Nn.)

78 \bool_new:N \g__xpin_yin_GBK_bool
79 \@ifpackageloaded { xeCJK }
80 { \AtEndOfPackage { \__xpin_yin_adjust_xeCJK_hook: } }
81 {
82   \@ifpackageloaded { CJKutf8 }
83   {
84     \prop_map_function:NN \c__xpin_yin_tone_prop \__xpin_yin_UTF_char:nn
85     \AtEndOfPackage { \__xpin_yin_adjust_CJK_hook: }
86   }
87   {
88     \@ifpackageloaded { CJK }
89     {
90       \RequirePackage { xCJK2uni }
91       \prop_map_function:NN \c__xpin_yin_tone_prop \__xpin_yin_GBK_char:nn
92       \AtEndOfPackage
93       {
94         \tl_put_right:Nn \l__xpin_yin_pinyin_box_hook_tl
95         { \c__xpin_yin_reset_UTF_cs_tl }
96         \__xpin_yin_adjust_CJK_hook:
97         \tl_use:N \c__xpin_yin_reset_UTF_catcode_tl
98       }
99       \bool_gset_true:N \g__xpin_yin_GBK_bool
100     }
101     {
102       \xetex_if_engine:TF
103       {
104         \RequirePackage { xeCJK }
105         \AtEndOfPackage { \__xpin_yin_adjust_xeCJK_hook: }
106       }
107       {
108         \RequirePackage { CJKutf8 }
109         \prop_map_function:NN \c__xpin_yin_tone_prop \__xpin_yin_UTF_char:nn
110         \AtEndOfPackage { \__xpin_yin_adjust_CJK_hook: }
111       }
112     }
113   }
114 }

```

\l__xpin_yin_tmpa_box

\l__xpin_yin_tmpp_box

```

115 \box_new:N \l__xpin_yin_tmpa_box
116 \box_new:N \l__xpin_yin_tmpp_box
(End definition for \l__xpin_yin_tmpa_box and \l__xpin_yin_tmpp_box.)

```

_xpinyin_make_box:nn

```
117 \cs_new_protected_nopar:Npn \_xpinyin_make_box:nn #1#2
118 {
119   \_xpinyin_save_CJKsymbol:n {#1}
120   \_xpinyin_make_pinyin_box:xnn { \_xpinyin_to_unicode:n {#1} } {#1} {#2}
121 }
(End definition for \_xpinyin_make_box:nn.)
```

_xpinyin_make_pinyin_box:nnn

```
122 \cs_new_protected_nopar:Npn \_xpinyin_make_pinyin_box:nnn #1#2#3
123 {
124   \hbox_overlap_left:n
125   {
126     \hbox_set:Nn \l__xpinyin_tmpa_box
127     { \_xpinyin_CJKsymbol_hook: \_xpinyin_save_CJKsymbol:n {#2} }
128     \hbox_set:Nn \l__xpinyin_tmpb_box
129     {
130       \l__xpinyin_pinyin_box_hook_tl
131       \color_group_begin: \color_ensure_current:
132       \_xpinyin_select_font:
133       \clist_if_exist:cTF { c__xpinyin_multiple_ #1 _clist }
134       { \l__xpinyin_multiple_tl \l__xpinyin_format_tl }
135       { \l__xpinyin_format_tl }
136       {#3}
137       \color_group_end:
138     }
139     \dim_compare:nNnT
140     { \box_wd:N \l__xpinyin_tmpb_box } >
141     { \box_wd:N \l__xpinyin_tmpa_box + \l__xpinyin_CJKglue_dim }
142     {
143       \box_resize:Nnn \l__xpinyin_tmpb_box
144       { \box_wd:N \l__xpinyin_tmpa_box + \l__xpinyin_CJKglue_dim }
145       { \box_ht:N \l__xpinyin_tmpb_box + \box_dp:N \l__xpinyin_tmpb_box }
146     }
147     \box_move_up:nn { \l__xpinyin_vsep_tl }
148     {
149       \hbox_to_wd:nn { \box_wd:N \l__xpinyin_tmpa_box }
150       { \tex_hss:D \box_use_clear:N \l__xpinyin_tmpb_box \tex_hss:D }
151     }
152   }
153   { \_xpinyin_CJK_node: }
154   \_xpinyin_ignore_spaces:w
155 }
156 \tl_new:N \l__xpinyin_pinyin_box_hook_tl
157 \cs_generate_variant:Nn \_xpinyin_make_pinyin_box:nnn { x }
(End definition for \_xpinyin_make_pinyin_box:nnn.)
```

_xpinyin_CJKsymbol:n

```
158 \cs_new_protected_nopar:Npn \_xpinyin_CJKsymbol:n #1
159 { \_xpinyin_CJKsymbol:xn { \_xpinyin_to_unicode:n {#1} } {#1} }
160 \cs_new_protected_nopar:Npn \_xpinyin_CJKsymbol:nn #1#2
161 {
162   \_xpinyin_save_CJKsymbol:n {#2}
163   \_xpinyin_make_pinyin_box:nnn {#1} {#2} { \use:c { c__xpinyin_ #1 _tl } }
164 }
165 \cs_generate_variant:Nn \_xpinyin_CJKsymbol:nn { x }
(End definition for \_xpinyin_CJKsymbol:n.)
```

pinyinscope

```
166 \NewDocumentEnvironment { pinyinscope } { 0 { } }
167 {
168   \keys_set:nn { xpinyin } {#1}
169   \tl_if_empty:NF \l__xpinyin_hsep_tl
170   { \cs_set_nopar:Npn \CJKglue { \skip_horizontal:n { \l__xpinyin_hsep_tl } } }
171   \settowidth \l__xpinyin_CJKglue_dim { \CJKglue }
172   \_xpinyin_replace_CJKsymbol:
173 }
174 { }
```

(End definition for *pinyin*scope. This function is documented on page 1.)

\xpinyin

```

175 \NewDocumentCommand \xpinyin { s O { } m }
176 {
177   \IfBooleanTF {#1}
178   {
179     \group_begin:
180     \keys_set:nn { xpinyin } {#2}
181     \tl_if_empty:NF \l__xpinyin_hsep_tl
182     { \cs_set_nopar:Npn \CJKglue { \skip_horizontal:n { \l__xpinyin_hsep_tl } } }
183     \settowidth \l__xpinyin_CJKglue_dim { \CJKglue }
184     \__xpinyin_replace_CJKsymbol:
185     #3
186     \group_end:
187   }
188   {
189     \group_begin:
190     \keys_set:nn { xpinyin } {#2}
191     \settowidth \l__xpinyin_CJKglue_dim { \CJKglue }
192     \__xpinyin_single_aux:nn {#3}
193   }
194 }

```

(End definition for *\xpinyin*. This function is documented on page 2.)

\l__xpinyin_CJKglue_dim

```

195 \dim_new:N \l__xpinyin_CJKglue_dim

```

(End definition for *\l__xpinyin_CJKglue_dim*.)

__xpinyin_single_aux:nn

```

196 \cs_new_protected_nopar:Npn \__xpinyin_single_aux:nn #1#2
197 {
198   \__xpinyin_single_hook:n
199   { \cs_set_eq:NN \__xpinyin_save_CJKsymbol:n \use:n }
200   \cs_set_eq:NN \__xpinyin_to_unicode:n \__xpinyin_char_to_unicode:n
201   \__xpinyin_make_box:nn {#1} { \__xpinyin_pinyin:n {#2} }
202   \group_end:
203 }

```

(End definition for *__xpinyin_single_aux:nn*.)

__xpinyin_replace_CJKsymbol_aux:

```

204 \cs_new_protected_nopar:Npn \__xpinyin_replace_CJKsymbol_aux:
205 {
206   \cs_if_eq:NNF \CJKsymbol \__xpinyin_CJKsymbol:n
207   {
208     \cs_set_eq:NN \__xpinyin_save_CJKsymbol:n \CJKsymbol
209     \cs_set_eq:NN \CJKsymbol \__xpinyin_CJKsymbol:n
210   }
211 }

```

(End definition for *__xpinyin_replace_CJKsymbol_aux:*.)

__xpinyin_single_hook_aux:n

```

212 \cs_new_protected_nopar:Npn \__xpinyin_single_hook_aux:n
213 {
214   \cs_if_eq:NNTF \CJKsymbol \__xpinyin_CJKsymbol:n
215   {
216     \cs_set_eq:NN \CJKsymbol \__xpinyin_save_CJKsymbol:n
217     \cs_set_eq:NN \__xpinyin_save_CJKsymbol:n \use:n
218   }
219 }

```

(End definition for *__xpinyin_single_hook_aux:n*.)

```

\__xpinyin_select_font_xetex:
220 \cs_new_protected_nopar:Npn \__xpinyin_select_font_xetex:
221 {
222   \cs_if_exist_use:cF { \l__xpinyin_coor_tl }
223   {
224     \tl_set:Nx \l__xpinyin_current_coor_tl { \l__xpinyin_coor_tl }
225     \__xpinyin_select_font_aux:
226     \int_compare:nNnF { \XeTeXfonttype \tex_font:D } = \c_zero
227     {
228       \exp_last_unbraced:NNV
229       \cs_gset_eq:cN \l__xpinyin_current_coor_tl \tex_font:D
230     }
231   }
232 }
(End definition for \__xpinyin_select_font_xetex:.)

\__xpinyin_select_font_aux:
233 \cs_new_protected_nopar:Npn \__xpinyin_select_font_aux:
234 {
235   \fontsize
236   { \l__xpinyin_ratio_tl \etex_dimexpr:D \f@size pt \scan_stop: }
237   { \f@baselineskip }
238   \l__xpinyin_font_tl
239   \selectfont
240 }
(End definition for \__xpinyin_select_font_aux:.)

\__xpinyin_to_unicode_xetex:n
241 \cs_new_nopar:Npn \__xpinyin_to_unicode_xetex:n #1
242 { \int_to_hexadecimal:n { `#1 } }
(End definition for \__xpinyin_to_unicode_xetex:n.)

\__xpinyin_UTF_to_unicode:n
\__xpinyin_UTFchar_to_unicode:n 243 \cs_new_nopar:Npn \__xpinyin_UTF_to_unicode:n #1
244 {
245   \int_to_hexadecimal:n
246   { \exp_args:No \int_from_hexadecimal: { \CJK@plane } * "100 + #1 }
247 }
248 \cs_new_nopar:Npn \__xpinyin_UTFchar_to_unicode:n #1
249 { \int_to_hexadecimal:n { \__xpinyin_UTF_viii_to_unicode:NNNw #1 \q_stop } }
250 \cs_new_nopar:Npn \__xpinyin_UTF_viii_to_unicode:NNNw #1#2#3#4 \q_stop
251 {
252   \tl_if_empty:nTF {#4}
253   { ( `#1 - "E0 ) * "1000 + ( `#2 - "80 ) * "40 + ( `#3 - "80 ) }
254   { ( `#1 - "F0 ) * "4000 + ( `#2 - "80 ) * "1000 + ( `#3 - "80 ) * "40 + ( `#4 - "80 ) }
255 }
(End definition for \__xpinyin_UTF_to_unicode:n and \__xpinyin_UTFchar_to_unicode:n.)

\__xpinyin_GBK_to_unicode:n
\__xpinyin_GBKchar_to_unicode:n 256 \cs_new_nopar:Npn \__xpinyin_GBK_to_unicode:n #1
257 { \CJKtu_sfd_map:nn { \CJK@plane } {#1} }
258 \cs_new_nopar:Npn \__xpinyin_GBKchar_to_unicode:n #1
259 { \CJKchartouni {#1} }
(End definition for \__xpinyin_GBK_to_unicode:n and \__xpinyin_GBKchar_to_unicode:n.)

\__xpinyin_adjust_xeCJK_hook:
260 \cs_new_protected_nopar:Npn \__xpinyin_adjust_xeCJK_hook:
261 {
262   \cs_new_eq:NN \__xpinyin_select_font: \__xpinyin_select_font_xetex:
263   \cs_new_eq:NN \__xpinyin_to_unicode:n \__xpinyin_to_unicode_xetex:n
264   \cs_new_eq:NN \__xpinyin_char_to_unicode:n \__xpinyin_to_unicode:n
265   \cs_new_eq:NN \__xpinyin_replace_CJKsymbol: \__xpinyin_replace_CJKsymbol_aux:
266   \cs_new_protected_nopar:Npn \__xpinyin_ignore_spaces:w { \xeCJK_ignore_spaces:w }
267   \cs_new_protected_nopar:Npn \__xpinyin_CJK_node: { \xeCJK_make_node:n { CJK } }
268   \tl_gset:Nn \l__xpinyin_coor_tl
269   { (\cs_meaning:N \l__xpinyin_font_tl)/\l_xeCJK_current_font_tl/\l__xpinyin_ratio_tl }

```

```

270 \cs_new_protected_nopar:Npn \__xpinyin_CJKsymbol_hook:
271 { \makeexeCJKinactive \xeCJK_select_font: }
272 \cs_new_protected_nopar:Npn \__xpinyin_single_hook:n
273 { \cs_if_eq:NNTF \CJKsymbol \__xpinyin_CJKsymbol:n { \cs_set_eq:NN \CJKsymbol \use:n } }
274 }

```

(End definition for __xpinyin_adjust_xeCJK_hook:.)

__xpinyin_adjust_CJK_hook:

```

275 \cs_new_protected_nopar:Npn \__xpinyin_adjust_CJK_hook:
276 {
277   \bool_if:NTF \g__xpinyin_GBK_bool
278   {
279     \cs_new_eq:NN \__xpinyin_to_unicode:n \__xpinyin_GBK_to_unicode:n
280     \cs_new_eq:NN \__xpinyin_char_to_unicode:n \__xpinyin_GBKchar_to_unicode:n
281   }
282   {
283     \cs_new_eq:NN \__xpinyin_to_unicode:n \__xpinyin_UTF_to_unicode:n
284     \cs_new_eq:NN \__xpinyin_char_to_unicode:n \__xpinyin_UTFchar_to_unicode:n
285   }
286   \cs_new_eq:NN \__xpinyin_select_font: \__xpinyin_select_font_aux:
287   \cs_new_eq:NN \__xpinyin_CJKsymbol_hook: \prg_do_nothing:
288   \cs_new_protected_nopar:Npn \__xpinyin_CJK_node: { \CJK@CJK }
289   \cs_new_protected_nopar:Npn \__xpinyin_ignore_spaces:w { \CJK@ignorespaces }
290   \@ifpackageloaded { CJKpunct }
291   { \__xpinyin_adjust_CJKpunct_hook: }
292   {
293     \cs_new_eq:NN \__xpinyin_single_hook:n \__xpinyin_single_hook_aux:n
294     \cs_new_eq:NN \__xpinyin_replace_CJKsymbol: \__xpinyin_replace_CJKsymbol_aux:
295     \AtBeginDocument
296     {
297       \@ifpackageloaded { CJKpunct }
298       {
299         \cs_undefine:N \__xpinyin_single_hook:n
300         \cs_undefine:N \__xpinyin_replace_CJKsymbol:
301         \__xpinyin_adjust_CJKpunct_hook:
302       } { }
303     }
304   }
305 }

```

(End definition for __xpinyin_adjust_CJK_hook:.)

__xpinyin_adjust_CJKpunct_hook:

```

306 \cs_new_protected_nopar:Npn \__xpinyin_adjust_CJKpunct_hook:
307 {
308   \cs_new_protected_nopar:Npn \__xpinyin_replace_CJKsymbol:
309   {
310     \int_compare:nNnTF { \CJKpunct@punctstyle } = { \CJKpunct@ps@plain }
311     { \__xpinyin_replace_CJKsymbol_aux: }
312     {
313       \cs_if_eq:NNF \CJKsymbol \__xpinyin_CJKsymbol:n
314       {
315         \cs_set_eq:NN \__xpinyin_save_CJKsymbol:n \CJKsymbol
316         \cs_set_eq:NN \CJKsymbol \__xpinyin_CJKsymbol:n
317       }
318     }
319   }
320   \cs_new_protected_nopar:Npn \__xpinyin_single_hook:n
321   {
322     \int_compare:nNnTF { \CJKpunct@punctstyle } = { \CJKpunct@ps@plain }
323     { \__xpinyin_single_hook_aux:n }
324     {
325       \cs_if_eq:NNTF \CJKsymbol \__xpinyin_CJKsymbol:n
326       {
327         \cs_set_eq:NN \CJKsymbol \__xpinyin_save_CJKsymbol:n
328         \cs_set_eq:NN \__xpinyin_save_CJKsymbol:n \use:n
329       }
330     }
331   }

```



```

332 }
(End definition for \_xpinyin_adjust_CJKpunct_hook:.)

```

\pinyin

```

333 \NewDocumentCommand \pinyin { 0 { } m }
334 {
335   \group_begin:
336   \keys_set:nn { xpinyin } {#1}
337   \l__xpinyin_font_tl
338   \l__xpinyin_format_tl
339   \selectfont
340   \c__xpinyin_reset_UTF_cs_tl
341   \_xpinyin_pinyin:n {#2}
342   \group_end:
343 }
(End definition for \pinyin. This function is documented on page 2.)

```

_xpinyin_pinyin:n

```

344 \cs_new_protected_nopar:Npn \_xpinyin_pinyin:n #1
345 {
346   \_xpinyin_pinyin_init:
347   \bool_set_true:N \l__xpinyin_first_bool
348   \tl_set:Nn \l__xpinyin_save_tl {#1}
349   \_xpinyin_pinyin_aux:n #1 \q_recursion_tail \q_recursion_stop
350 }
(End definition for \_xpinyin_pinyin:n.)

```

_xpinyin_pinyin_aux:n

```

351 \cs_new_protected_nopar:Npn \_xpinyin_pinyin_aux:n #1
352 {
353   \quark_if_recursion_tail_stop_do:nn {#1}
354   {
355     \bool_if:NTF \l__xpinyin_first_bool { \l__xpinyin_save_tl }
356     { \tl_if_empty:NF \l__xpinyin_item_tl { \l__xpinyin_pysep_tl \l__xpinyin_item_tl } }
357   }
358   \_xpinyin_if_number:nTF {#1}
359   {
360     \bool_if:NTF \l__xpinyin_first_bool
361     { \bool_set_false:N \l__xpinyin_first_bool }
362     { \l__xpinyin_pysep_tl }
363     \l__xpinyin_pre_tl
364     \_xpinyin_tone:Nn \l__xpinyin_tone_tl {#1}
365     \l__xpinyin_post_tl
366     \_xpinyin_pinyin_init:
367   }
368   {
369     \int_compare:nNnTF
370     { 0 \cs_if_exist_use:c { c__xpinyin_ \tl_to_str:N \l__xpinyin_tone_tl _tl } } >
371     { 0 \cs_if_exist_use:c { c__xpinyin_ \tl_to_str:n {#1} _tl } }
372     { \tl_put_right:Nn \l__xpinyin_post_tl {#1} }
373     {
374       \tl_set:Nn \l__xpinyin_tone_tl {#1}
375       \tl_set_eq:NN \l__xpinyin_pre_tl \l__xpinyin_item_tl
376       \tl_clear:N \l__xpinyin_post_tl
377     }
378     \tl_put_right:Nx \l__xpinyin_item_tl { \_xpinyin_replace_v:n {#1} }
379   }
380   \_xpinyin_pinyin_aux:n
381 }
(End definition for \_xpinyin_pinyin_aux:n.)

```

_xpinyin_tone:Nn

```

382 \cs_new_protected_nopar:Npn \_xpinyin_tone:Nn #1#2
383 { \use:c { __xpinyin_num_to_tone_ #1 :Nn } {#1} {#2} }
384 \cs_generate_variant:Nn \_xpinyin_tone:Nn { V }
(End definition for \_xpinyin_tone:Nn.)

```

_xpinyin_replace_v:n

```
385 \cs_new_nopar:Npn \_xpinyin_replace_v:n #1
386 {
387   \str_if_eq:nnTF {#1} { v }
388   {
389     \str_case:onTF { \l__xpinyin_item_tl }
390     { { l } { } { n } { } { L } { } { N } { } }
391     { \exp_not:n { ü } } { u }
392   }
393   { \exp_not:n {#1} }
394 }
```

(End definition for _xpinyin_replace_v:n.)

_xpinyin_pinyin_init:

```
395 \cs_new_nopar:Npn \_xpinyin_pinyin_init:
396 {
397   \tl_clear:N \l__xpinyin_pre_tl   \tl_clear:N \l__xpinyin_post_tl
398   \tl_clear:N \l__xpinyin_item_tl \tl_clear:N \l__xpinyin_tone_tl
399 }
```

(End definition for _xpinyin_pinyin_init:.)

_xpinyin_if_number:nTF

```
400 \prg_new_conditional:Npnn \_xpinyin_if_number:n #1 { TF }
401 {
402   \if_int_compare:w \c_one < 1 \tl_to_str:n {#1} \exp_stop_f:
403   \prg_return_true: \else: \prg_return_false: \fi:
404 }
```

(End definition for _xpinyin_if_number:nTF.)

\l__xpinyin_first_bool

```
405 \bool_new:N \l__xpinyin_first_bool
(End definition for \l__xpinyin_first_bool.)
```

\c__xpinyin_a_tl

\c__xpinyin_o_tl

\c__xpinyin_e_tl

\c__xpinyin_i_tl

\c__xpinyin_u_tl

\c__xpinyin_v_tl

```
406 \tl_const:Nn \c__xpinyin_a_tl { 3 }
407 \tl_const:Nn \c__xpinyin_o_tl { 2 }
408 \tl_const:Nn \c__xpinyin_e_tl { 2 }
409 \tl_const:Nn \c__xpinyin_i_tl { 1 }
410 \tl_const:Nn \c__xpinyin_u_tl { 1 }
411 \tl_const:Nn \c__xpinyin_v_tl { 1 }
```

(End definition for \c__xpinyin_a_tl and others.)

_xpinyin_num_to_tone:Nn

```
412 \cs_new_protected_nopar:Npn \_xpinyin_num_to_tone:Nn #1#2
413 {
414   \if_case:w \int_eval:n { #2 - \c_one } \exp_stop_f:
415   \= {#1} \or: \' {#1} \or: \v {#1} \or: \` {#1} \else: #1 \fi:
416 }
417 \tl_map_inline:nn { a o e u }
418 { \cs_new_eq:cN { __xpinyin_num_to_tone_ #1 :Nn } \_xpinyin_num_to_tone:Nn }
419 \cs_new_nopar:Npn \_xpinyin_num_to_tone_i:Nn #1#2
420 {
421   \if_case:w \int_eval:n { #2 - \c_one } \exp_stop_f:
422   ī \or: í \or: ï \or: i \else: i \fi:
423 }
424 \cs_new_protected_nopar:Npn \_xpinyin_num_to_tone_v:Nn #1#2
425 {
426   \str_case:onTF { \l__xpinyin_pre_tl }
427   { { l } { } { n } { } { L } { } { N } { } }
428   {
429     \if_case:w \int_eval:n { #2 - \c_one } \exp_stop_f:
430     ū \or: ú \or: ũ \or: û \else: ü \fi:
431   }
432   { \_xpinyin_num_to_tone:Nn u {#2} }
433 }
```

(End definition for _xpinyin_num_to_tone:Nn.)

`\xpinyinsetup`

```
434 \NewDocumentCommand \xpinyinsetup { m } { \keys_set:nn { xpinyin } {#1} }
```

(End definition for `\xpinyinsetup`. This function is documented on page 2.)

```
ratio
vsep 435 \clist_map_inline:nn
hsep 436 { ratio , vsep , hsep , pysep , font , format , multiple }
pysep 437 { \keys_define:nn { xpinyin } { #1 .tl_set:c = { l__xpinyin_ #1 _tl } } }
font 438 \keys_set:nn { xpinyin }
439 {
format 440 ratio = .4 ,
multiple 441 vsep = 1 em ,
442 pysep = \c_space_tl ,
443 font = \normalfont ,
444 }
```

(End definition for `ratio` and others. These functions are documented on page 2.)

`xpinyin-map.cfg`

```
445 \group_begin:
446 \char_set_catcode_active:N \U
447 \char_set_catcode_active:N \V
448 \cs_set_nopar:Npn U+ #1 ~ #2 ~
449 { \tl_gset:cn { c__xpinyin_ #1 _tl } {#2} }
450 \cs_set_nopar:Npn V+ #1 ~ #2 ~
451 { \clist_gset:cn { c__xpinyin_multiple_ #1 _clist } {#2} }
452 \use:n
453 {
454 \char_set_catcode_space:N \
455 \file_input:n { xpinyin-map.cfg }
456 }
457 \group_end:
```

(End definition for `xpinyin-map.cfg`.)

`\setpinyin`

```
458 \NewDocumentCommand \setpinyin { m m }
459 {
460 \tl_set:cn
461 { c__xpinyin_ __xpinyin_char_to_unicode:n {#1} _tl }
462 { __xpinyin_pinyin:n {#2} }
463 }
```

(End definition for `\setpinyin`. This function is documented on page 2.)

```
464 \ProcessKeysOptions { xpinyin }
465 \endpackage
```

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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