

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 只支持采用 UTF-8 编码的 \TeX 源文件。如果使用 \LaTeX 或 \pdfLaTeX 的编译方式, 则 xpinyin 依赖 CJKutf8 宏包¹; 如果使用 \XeLaTeX , 则依赖 xeCJK 宏包²。xpinyin 不会自动载入 CJKutf8 或 xeCJK 宏包, 应该在它之前或之后自行载入。

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}
```

(\pdfLaTeX) 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³ 共同使用, 使用方式与上面类似。

¹<http://mirrors.ctan.org/language/chinese/CJK/>

²<http://mirrors.ctan.org/macros/xetex/latex/xecjk/>

³<http://mirrors.ctan.org/language/chinese/ctex/>

3 用户手册

`pinyin`scope `\begin{pinyin}`scope}[*options*]

.....

`\end{pinyin}`scope}

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 yuè zhě liǎo rán bù huò
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，方使阅者了然不惑。

可选项 *options* 用于局部设置拼音的格式，将在下面说明。

`\xpinyin` `\xpinyin` [*options*] {<单个汉字>} {<拼音>}

`\xpinyin*` [*options*] {<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，

cháng
长
zhēn shì yǐn mèng huàn shí tōng líng
甄士隐梦幻识通灵
zhòng yào
重要

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

`\pinyin` `\pinyin` [*options*] {<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` `\setpinyin` {<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⁴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` `\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 *key* 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。

⁴<http://www.unicode.org/Public/UNIDATA/Unihan.zip>

hsep `hsep = {\langle skip \rangle}`

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

jiǎ yǔ cūnfēngchénhuái guī xiù
贾 雨 村 风 尘 怀 闺 秀

pysep `pysep = {\langle glue \rangle}`

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 = {\langle font \rangle}`

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 = {\langle format \rangle}`

设置拼音的其它格式, 例如颜色等, 缺省值为空。

multiple `multiple = {\langle format \rangle}`

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:

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

4 代码实现

```
1 \ProvidesExplPackage{\ExplFileName}{\ExplFileDate}{1.1}{\ExplFileDescription}
2 \msg_new:nnn { xypinyin } { no-LuaTeX }
3 {
4   The~xypinyin~package~is~not~supported~in~LuaTeX.\\\
5   You~must~change~your~typesetting~engine~to\\
6   "xelatex"~or~"pdflatex"~or~"latex"~instead~of~"lualatex".
7 }
8 \luatex_if_engine:T { \msg_critical:nn { xypinyin } { no-LuaTeX } }
9 \RequirePackage{xparse}
10 \RequirePackage{l3keys2e}
```

`\l_xypinyin_tmpa_box`

`\l_xypinyin_tmpp_box`

```
11 \box_new:N \l_xypinyin_tmpa_box
```

```
12 \box_new:N \l_xypinyin_tmpp_box
```

(End definition for `\l_xypinyin_tmpa_box` and `\l_xypinyin_tmpp_box`)

`\xypinyin_make_box:nn`

```
13 \cs_new_nopar:Nn \xypinyin_make_box:nn
```

```
14 { \xypinyin_save_CJKsymbol:n {#1} \xypinyin_make_pinyin_box:nn {#1} {#2} }
```

(End definition for `\xypinyin_make_box:nn`)

\xpinyin_make_pinyin_box:nn

```
15 \cs_new_nopar:Nn \xpinyin_make_pinyin_box:nn
16 {
17   \hbox_overlap_left:n
18   {
19     \hbox_set:Nn \l_xpinyin_tmpa_box
20     { \xpinyin_CJKsymbol_hook: \xpinyin_save_CJKsymbol:n {#1} }
21     \hbox_set:Nn \l_xpinyin_tmpb_box
22     {
23       \color_group_begin: \color_ensure_current:
24       \xpinyin_select_font:
25       \l_xpinyin_format_tl
26       \clist_if_exist:cT
27       { c_xpinyin_multiple_ \xpinyin_CJKsymbol_to_unicode:n {#1} _clist }
28       { \l_xpinyin_multiple_tl }
29       {#2}
30       \color_group_end:
31     }
32     \dim_compare:nNnT
33     { \box_wd:N \l_xpinyin_tmpb_box } >
34     { \box_wd:N \l_xpinyin_tmpa_box + \l_xpinyin_CJKglue_dim }
35     {
36       \box_resize:Nnn \l_xpinyin_tmpb_box
37       { \dim_eval:n { \box_wd:N \l_xpinyin_tmpa_box + \l_xpinyin_CJKglue_dim } }
38       { \dim_eval:n { \box_ht:N \l_xpinyin_tmpb_box + \box_dp:N \l_xpinyin_tmpb_box } }
39     }
40     \box_move_up:nn { \l_xpinyin_vsep_tl }
41     {
42       \hbox_to_wd:nn { \box_wd:N \l_xpinyin_tmpa_box }
43       { \tex_hss:D \box_use_clear:N \l_xpinyin_tmpb_box \tex_hss:D }
44     }
45   }
46   { \xpinyin_CJK_node: }
47   \xpinyin_CJK_ignorespaces:
48 }
```

(End definition for \xpinyin_make_pinyin_box:nn)

\xpinyin_CJKsymbol:n

```
49 \cs_new_nopar:Nn \xpinyin_CJKsymbol:n
50 { \xpinyin_make_box:nn {#1} { \xpinyin_to_pinyin:n {#1} } }
```

(End definition for \xpinyin_CJKsymbol:n)

\xpinyin_to_pinyin:n

```
51 \cs_new_nopar:Nn \xpinyin_to_pinyin:n
52 { \use:c { c_xpinyin_ \xpinyin_CJKsymbol_to_unicode:n {#1} _tl } }
```

(End definition for \xpinyin_to_pinyin:n)

pinyinscope

```
53 \NewDocumentEnvironment { pinyinscope } { 0{} }
54 {
55   \keys_set:nn { xpinyin } {#1}
56   \tl_if_empty:NF \l_xpinyin_hsep_tl
```

```

57     { \cs_set_nopar:Npn \CJKglue { \skip_horizontal:n { \l_xpinyin_hsep_tl } } }
58     \settowidth \l_xpinyin_CJKglue_dim { \CJKglue }
59     \xpinyin_replace_CJKsymbol:
60   }
61   { \cs_gset_eq:NN \CJKsymbol \xpinyin_save_CJKsymbol:n }
(End definition for pinyinscope This function is documented on page 2.)

```

\xpinyin

```

62 \NewDocumentCommand \xpinyin { s O{} m }
63 {
64   \IfBooleanTF {#1}
65   {
66     \group_begin:
67     \keys_set:nn { xpinyin } {#2}
68     \tl_if_empty:NF \l_xpinyin_hsep_tl
69     { \cs_set_nopar:Npn \CJKglue { \skip_horizontal:n { \l_xpinyin_hsep_tl } } }
70     \settowidth \l_xpinyin_CJKglue_dim { \CJKglue }
71     \xpinyin_replace_CJKsymbol:
72     #3
73     \group_end:
74   }
75   {
76     \group_begin:
77     \keys_set:nn { xpinyin } {#2}
78     \settowidth \l_xpinyin_CJKglue_dim { \CJKglue }
79     \xpinyin_xpinyin_single_aux:nn {#3}
80   }
81 }
(End definition for \xpinyin This function is documented on page 2.)

```

\l_xpinyin_CJKglue_dim

```

82 \dim_new:N \l_xpinyin_CJKglue_dim
(End definition for \l_xpinyin_CJKglue_dim)

```

\xpinyin_xpinyin_single_aux:nn

```

83 \cs_new_nopar:Nn \xpinyin_xpinyin_single_aux:nn
84 {
85   \xpinyin_xpinyin_single_hook:n
86   { \cs_set_eq:NN \xpinyin_save_CJKsymbol:n \use:n }
87   \cs_set_eq:NN \xpinyin_CJKsymbol_to_unicode:n \xpinyin_CJKchar_to_unicode:n
88   \xpinyin_make_box:nn {#1} { \xpinyin_pinyin:n {#2} }
89   \group_end:
90 }
(End definition for \xpinyin_xpinyin_single_aux:nn)

```

\xpinyin_replace_CJKsymbol_aux:

```

91 \cs_new_nopar:Nn \xpinyin_replace_CJKsymbol_aux:
92 {
93   \cs_if_eq:NNF \CJKsymbol \xpinyin_CJKsymbol:n
94   {
95     \cs_set_eq:NN \xpinyin_save_CJKsymbol:n \CJKsymbol
96     \cs_set_eq:NN \CJKsymbol \xpinyin_CJKsymbol:n
97   }
98 }

```

(End definition for \xpinyin_replace_CJKsymbol_aux:)

\xpinyin_xpinyin_single_hook_aux:n

```

99 \cs_new_nopar:Npn \xpinyin_xpinyin_single_hook_aux:n
100 {
101   \cs_if_eq:NNTF \CJKsymbol \xpinyin_CJKsymbol:n
102   {
103     \cs_set_eq:NN \CJKsymbol \xpinyin_save_CJKsymbol:n
104     \cs_set_eq:NN \xpinyin_save_CJKsymbol:n \use:n
105   }
106 }

```

(End definition for \xpinyin_xpinyin_single_hook_aux:n)

\xpinyin_select_font_xetex:

```

107 \cs_new_nopar:Nn \xpinyin_select_font_xetex:
108 {
109   \cs_if_exist_use:cF { \l_xpinyin_coor_tl }
110   {
111     \tl_set:Nx \l_xpinyin_current_coor_tl { \l_xpinyin_coor_tl }
112     \xpinyin_select_font_aux:
113     \int_compare:nNnT { \XeTeXfonttype \tex_font:D } > \c_zero
114     {
115       \exp_last_unbraced:NNV
116       \cs_gset_eq:cN \l_xpinyin_current_coor_tl \tex_font:D
117     }
118   }
119 }

```

(End definition for \xpinyin_select_font_xetex:)

\xpinyin_select_font_aux:

```

120 \cs_new_nopar:Nn \xpinyin_select_font_aux:
121 {
122   \dim_set:Nn \l_tmpa_dim { \f@size \p@ }
123   \fontsize { \l_xpinyin_ratio_tl \l_tmpa_dim } \c_zero_dim
124   \l_xpinyin_font_tl
125   \selectfont
126 }

```

(End definition for \xpinyin_select_font_aux:)

\xpinyin_CJKsymbol_to_unicode_xetex:n

```

127 \cs_new_nopar:Nn \xpinyin_CJKsymbol_to_unicode_xetex:n { \int_to_hexadecimal:n {`#1} }

```

(End definition for \xpinyin_CJKsymbol_to_unicode_xetex:n)

\xpinyin_CJKsymbol_to_unicode_pdftex:n

\xpinyin_CJKchar_to_unicode_pdftex:n

```

128 \cs_new_nopar:Nn \xpinyin_CJKsymbol_to_unicode_pdftex:n
129 { \int_to_hexadecimal:n { \int_from_hexadecimal:V \CJK@plane * "100 + #1 } }
130 \cs_new_nopar:Nn \xpinyin_CJKchar_to_unicode_pdftex:n
131 { \int_to_hexadecimal:n { \xpinyin_UTF_viii_to_unicode:NNNw #1 \q_stop } }
132 \cs_new_nopar:Npn \xpinyin_UTF_viii_to_unicode:NNNw #1#2#3#4 \q_stop
133 {
134   \tl_if_empty:nTF {#4}
135   { ( `#1 - "E0 ) * "1000 + ( `#2 - "80 ) * "40 + ( `#3 - "80 ) }
136   { ( `#1 - "F0 ) * "4000 + ( `#2 - "80 ) * "1000 + ( `#3 - "80 ) * "40 + ( `#4 - "80 ) }

```

```

137 }
138 \cs_generate_variant:Nn \int_from_hexadecimal:n { V }
(End definition for \xpinyin_CJKsymbol_to_unicode_pdftex:n and \xpinyin_CJKchar_to_unicode_pdftex:n)

```

\xpinyin_adjust_xeCJK_hook:

```

139 \cs_new_nopar:Nn \xpinyin_adjust_xeCJK_hook:
140 {
141   \cs_new_eq:NN \xpinyin_select_font: \xpinyin_select_font_xetex:
142   \cs_new_eq:NN \xpinyin_CJKsymbol_to_unicode:n \xpinyin_CJKsymbol_to_unicode_xetex:n
143   \cs_new_eq:NN \xpinyin_CJKchar_to_unicode:n \xpinyin_CJKsymbol_to_unicode:n
144   \cs_new_eq:NN \xpinyin_replace_CJKsymbol: \xpinyin_replace_CJKsymbol_aux:
145   \cs_new_eq:NN \xpinyin_CJK_node: \xeCJK_CJK_kern:
146   \cs_new_eq:NN \xpinyin_CJK_ignorespaces: \xeCJK_ignorespaces:
147   \cs_if_exist:NF \xpinyin_CJK_node:
148     { \cs_new_nopar:Npn \xpinyin_CJK_node: { \xeCJK_make_node:n { CJK } } }
149   \tl_gset:Nn \l_xpinyin_coord_tl
150   { (\cs_meaning:N \l_xpinyin_font_tl)/\l_xeCJK_font_coord_tl/\l_xpinyin_ratio_tl }
151   \cs_new_nopar:Nn \xpinyin_CJKsymbol_hook: { \make_xeCJK_inactive \xeCJK_select_font: }
152   \cs_new_nopar:Npn \xpinyin_xpinyin_single_hook:n
153   { \cs_if_eq:NNTF \CJKsymbol \xpinyin_CJKsymbol:n { \cs_set_eq:NN \CJKsymbol \use:n } }
154 }
(End definition for \xpinyin_adjust_xeCJK_hook:)

```

\xpinyin_adjust_CJK_hook:

```

155 \cs_new_nopar:Nn \xpinyin_adjust_CJK_hook:
156 {
157   \cs_new_eq:NN \xpinyin_select_font: \xpinyin_select_font_aux:
158   \cs_new_eq:NN \xpinyin_CJKsymbol_to_unicode:n \xpinyin_CJKsymbol_to_unicode_pdftex:n
159   \cs_new_eq:NN \xpinyin_CJKchar_to_unicode:n \xpinyin_CJKchar_to_unicode_pdftex:n
160   \cs_new_eq:NN \xpinyin_CJKsymbol_hook: \prg_do_nothing:
161   \cs_new_eq:NN \xpinyin_CJK_node: \CJK@CJK
162   \cs_new_eq:NN \xpinyin_CJK_ignorespaces: \prg_do_nothing:
163   \@ifpackageloaded { CJKpunct }
164     { \xpinyin_adjust_CJKpunct_hook: }
165     {
166       \cs_new_eq:NN \xpinyin_replace_CJKsymbol: \xpinyin_replace_CJKsymbol_aux:
167       \cs_new_eq:NN \xpinyin_xpinyin_single_hook:n \xpinyin_xpinyin_single_hook_aux:n
168     }
169   \prop_map_function:NN \g_xpinyin_tone_prop \DeclareUnicodeCharacter
170 }
(End definition for \xpinyin_adjust_CJK_hook:)

```

\xpinyin_adjust_CJKpunct_hook:

```

171 \cs_new_nopar:Nn \xpinyin_adjust_CJKpunct_hook:
172 {
173   \cs_new_nopar:Nn \xpinyin_replace_CJKsymbol:
174   {
175     \int_compare:nNnTF { \CJKpunct@punctstyle } = { \CJKpunct@ps@plain }
176     { \xpinyin_replace_CJKsymbol_aux: }
177     {
178       \cs_if_eq:NNTF \CJKsymbol \xpinyin_CJKsymbol:n
179       {
180         \cs_set_eq:NN \xpinyin_save_CJKsymbol:n \CJKsymbol

```

```

181         \cs_set_eq:NN \CJKsymbol \xpinyin_CJKsymbol:n
182     }
183 }
184 }
185 \cs_new_nopar:Npn \xpinyin_xpinyin_single_hook:n
186 {
187     \int_compare:nNnTF { \CJKpunct@punctstyle } = { \CJKpunct@ps@plain }
188     { \xpinyin_xpinyin_single_hook_aux:n }
189     {
190         \cs_if_eq:NNTF \CJKsymbol \xpinyin_CJKsymbol:n
191         {
192             \cs_set_eq:NN \CJKsymbol \xpinyin_save_CJKsymbol:n
193             \cs_set_eq:NN \xpinyin_save_CJKsymbol:n \use:n
194         }
195     }
196 }
197 }
(End definition for \xpinyin_adjust_CJKpunct_hook:)
198 \AtBeginDocument
199 {
200     \ifpackageloaded { xeCJK }
201     { \xpinyin_adjust_xeCJK_hook: }
202     {
203         \ifpackageloaded { CJKutf8 }
204         { \xpinyin_adjust_CJK_hook: }
205         { \msg_warning:nn { xpinyin } { invalid } }
206     }
207 }
208 \msg_new:nnn { xpinyin } { invalid }
209 {
210     If~you~want~to~use~xpinyin~in~the~right~way,~you~\
211     should~load~the~\xetex_if_engine:TF { xeCJK } { CJKutf8 }~
212     package~in~the~preamble.\
213 }

```

\pinyin

```

214 \NewDocumentCommand \pinyin { O{} m }
215 {
216     \group_begin:
217     \keys_set:nn { xpinyin } {#1}
218     \l_xpinyin_font_tl
219     \l_xpinyin_format_tl
220     \selectfont
221     \xpinyin_pinyin:n {#2}
222     \group_end:
223 }
(End definition for \pinyin This function is documented on page 2.)

```

\xpinyin_pinyin:n

```

224 \cs_new_nopar:Nn \xpinyin_pinyin:n
225 {
226     \xpinyin_xpinyin_init:
227     \bool_set_true:N \l_xpinyin_first_bool

```

```

228 \tl_set:Nn \l_xpinyin_save_tl {#1}
229 \xpinyin_xpinyin_aux:N #1 \q_recursion_tail \q_recursion_stop
230 }
(End definition for \xpinyin_pinyin:n)

```

\xpinyin_xpinyin_aux:N

```

231 \cs_new_nopar:Nn \xpinyin_xpinyin_aux:N
232 {
233   \quark_if_recursion_tail_stop_do:Nn #1
234   {
235     \bool_if:NTF \l_xpinyin_first_bool { \l_xpinyin_save_tl }
236     { \tl_if_empty:NF \l_tmpc_tl { \l_xpinyin_pysep_tl \l_tmpc_tl } }
237   }
238   \xpinyin_if_number:NTF {#1}
239   {
240     \bool_if:NTF \l_xpinyin_first_bool
241     { \bool_set_false:N \l_xpinyin_first_bool }
242     { \l_xpinyin_pysep_tl }
243     \l_tmpa_tl
244     \xpinyin_tone:Vn \l_xpinyin_tone_tl {#1}
245     \l_tmpb_tl
246     \xpinyin_xpinyin_init:
247   }
248   {
249     \int_compare:nNnTF
250     { 0 \use:c { c_xpinyin_ \tl_to_str:V \l_xpinyin_tone_tl _tl } } >
251     { 0 \use:c { c_xpinyin_ \tl_to_str:n {#1} _tl } }
252     { \tl_put_right:Nn \l_tmpb_tl {#1} }
253     {
254       \tl_set:Nn \l_xpinyin_tone_tl {#1}
255       \tl_set_eq:NN \l_tmpa_tl \l_tmpc_tl
256       \tl_clear:N \l_tmpb_tl
257     }
258     \tl_put_right:Nx \l_tmpc_tl { \xpinyin_replace_v:N {#1} }
259   }
260   \xpinyin_xpinyin_aux:N
261 }
262 \cs_generate_variant:Nn \tl_to_str:n { V }
(End definition for \xpinyin_xpinyin_aux:N)

```

\xpinyin_tone:Nn

```

263 \cs_new_nopar:Nn \xpinyin_tone:Nn
264 { \use:c { xpinyin_num_to_tone_ #1 :Nn } {#1} {#2} }
265 \cs_generate_variant:Nn \xpinyin_tone:Nn { V }
(End definition for \xpinyin_tone:Nn)

```

\xpinyin_replace_v:N

```

266 \cs_new_nopar:Nn \xpinyin_replace_v:N
267 {
268   \str_if_eq:nnTF {#1} { v }
269   {
270     \bool_if:nTF
271     { \str_if_eq_p:Vn \l_tmpc_tl { l } || \str_if_eq_p:Vn \l_tmpc_tl { n } }

```

```

272      { \exp_not:n { ü } } { u }
273    }
274    { \exp_not:n {#1} }
275  }

```

(End definition for \xpinyin_replace_v:N)

\xpinyin_xpinyin_init:

```

276 \cs_new_nopar:Nn \xpinyin_xpinyin_init:
277 {
278   \tl_clear:N \l_tmpa_tl   \tl_clear:N \l_tmpb_tl
279   \tl_clear:N \l_tmpc_tl   \tl_clear:N \l_xpinyin_tone_tl
280 }

```

(End definition for \xpinyin_xpinyin_init:)

\xpinyin_if_number_p:N

```

\xpinyin_if_number:NTF 281 \prg_new_conditional:Nnn \xpinyin_if_number:N { p , T , F , TF }
282 {
283   \if_int_compare:w \c_one < 1 #1 \exp_stop_f:
284   \prg_return_true: \else: \prg_return_false: \fi:
285 }

```

(End definition for \xpinyin_if_number:N)

\l_xpinyin_first_bool

```

286 \bool_new:N \l_xpinyin_first_bool

```

(End definition for \l_xpinyin_first_bool)

\c_xpinyin_a_tl

```

\c_xpinyin_o_tl 287 \tl_const:Nn \c_xpinyin_a_tl { 3 }

```

```

\c_xpinyin_e_tl 288 \tl_const:Nn \c_xpinyin_o_tl { 2 }

```

```

\c_xpinyin_i_tl 289 \tl_const:Nn \c_xpinyin_e_tl { 2 }

```

```

\c_xpinyin_u_tl 290 \tl_const:Nn \c_xpinyin_i_tl { 1 }

```

```

\c_xpinyin_v_tl 291 \tl_const:Nn \c_xpinyin_u_tl { 1 }

```

```

292 \tl_const:Nn \c_xpinyin_v_tl { 1 }

```

(End definition for \c_xpinyin_a_tl and others.)

\xpinyin_num_to_tone:Nn

```

293 \cs_new_nopar:Nn \xpinyin_num_to_tone:Nn
294 {
295   \if_case:w \int_eval:n { #2 - \c_one } \exp_stop_f:
296   \= {#1} \or: \' {#1} \or: \v {#1} \or: \' {#1} \else: #1 \fi:
297 }
298 \tl_map_inline:nn { a o e u }
299 { \cs_new_eq:cN { xpinyin_num_to_tone_ #1 :Nn } \xpinyin_num_to_tone:Nn }
300 \cs_new_nopar:Nn \xpinyin_num_to_tone_i:Nn
301 {
302   \if_case:w \int_eval:n { #2 - \c_one } \exp_stop_f:
303   \or: í \or:   \or: ì \else: i \fi:
304 }
305 \cs_new_nopar:Nn \xpinyin_num_to_tone_v:Nn
306 {
307   \bool_if:nTF
308     { \str_if_eq_p:Vn \l_tmpa_tl { 1 } || \str_if_eq_p:Vn \l_tmpa_tl { n } }

```

```

309     {
310         \if_case:w \int_eval:n { #2 - \c_one } \exp_stop_f:
311         \or: \or: \or: \else: ü \fi:
312     }
313     { \xpinyin_num_to_tone:Nn u {#2} }
314 }
(End definition for \xpinyin_num_to_tone:Nn)

```

```

\g_xpinyin_tone_prop
\xpinyin_prop_put_aux:n
315 \prop_new:N \g_xpinyin_tone_prop
316 \cs_new_nopar:Nn \xpinyin_prop_put_aux:n { \prop_gput:Nnn \g_xpinyin_tone_prop #1 }
317 \clist_map_function:nN
318 {
319     {0101}{\=a} ,      {00E1}{\'a} ,      {01CE}{\v{a}} ,      {00E0}{\`a} ,
320     {014D}{\=o} ,      {00F3}{\'o} ,      {01D2}{\v{o}} ,      {00F2}{\`o} ,
321     {0113}{\=e} ,      {00E9}{\'e} ,      {011B}{\v{e}} ,      {00E8}{\`e} ,
322     {012B}{\={i}} ,    {00ED}{\'{i}} ,      {01D0}{\v{i}} ,      {00EC}{\`{i}} ,
323     {016B}{\=u} ,      {00FA}{\'u} ,      {01D4}{\v{u}} ,      {00F9}{\`u} ,
324     {00FC}{\"u} ,
325     {01D6}{\={\"u}} , {01D8}{\'{\"u}} , {01DA}{\v{\"u}} , {01DC}{\`{\"u}}
326 }
327 \xpinyin_prop_put_aux:n
(End definition for \g_xpinyin_tone_prop and \xpinyin_prop_put_aux:n)

```

\xpinyinsetup

```

328 \NewDocumentCommand \xpinyinsetup { m } { \keys_set:nn { xpinyin } {#1} }
(End definition for \xpinyinsetup This function is documented on page 2.)

```

```

ratio
vsep 329 \clist_map_inline:nn
hsep 330 { ratio , vsep , hsep , pysep , font , format , multiple }
pysep 331 { \keys_define:nn { xpinyin } { #1 .tl_set:c = { l_xpinyin_ #1 _tl } } }
font 332 \keys_set:nn { xpinyin }
format 333 {
multiple 334     ratio    = .4 ,
335     vsep     = 1 em ,
336     pysep    = \c_space_tl ,
337     font     = \normalfont ,
338 }
(End definition for ratio and others. These functions are documented on page 3.)

```

xpinyin-map.cfg

```

339 \group_begin:
340 \char_set_catcode_active:N \U
341 \char_set_catcode_active:N \V
342 \cs_set_nopar:Npn U+ #1 ~ #2 ~ { \tl_gset:cn { c_xpinyin_ #1 _tl } {#2} }
343 \cs_set_nopar:Npn V+ #1 ~ #2 ~ { \clist_gset:cn { c_xpinyin_multiple_ #1 _clist } {#2} }
344 \char_set_catcode_space:N \
345 \file_input:n {xpinyin-map.cfg}
346 \group_end:
(End definition for xpinyin-map.cfg)

```

\setpinyin

```
347 \NewDocumentCommand \setpinyin { m m }
348 {
349   \tl_set:cn
350     { c_xpinyin_ \xpinyin_CJKchar_to_unicode:n {#1} _tl }
351     { \xpinyin_pinyin:n {#2} }
352 }
```

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

```
353 \ProcessKeysOptions { xpinyin }
```

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,而直立体的数字表示对应项使用时所在的行号。

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