

The Sounds of Mandarin Chinese

(technical report)

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title: *The Sounds of Mandarin Chinese*
document type: technical report
author: Daniel J. Greenhoe
version: VERSION 0.20X
time stamp: 2018 January 17 (Wednesday) 02:55am UTC
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document url: <https://www.researchgate.net/project/Language-Toolbox>
TECkit maps: <https://github.com/dgreenhoe/teckitmaps>
<https://github.com/dgreenhoe/unihan>

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*“Here, on the level sand,
Between the sea and land,
What shall I build or write
Against the fall of night?”*



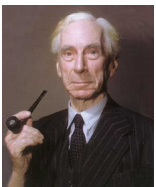
Alfred Edward Housman, English poet (1859–1936) ¹

*“Tell me of runes to grave
That hold the bursting wave,
Or bastions to design
For longer date than mine.”*



“The uninitiated imagine that one must await inspiration in order to create. That is a mistake. I am far from saying that there is no such thing as inspiration; quite the opposite. It is found as a driving force in every kind of human activity, and is in no wise peculiar to artists. But that force is brought into action by an effort, and that effort is work. Just as appetite comes by eating so work brings inspiration, if inspiration is not discernible at the beginning.”






Igor Fyodorovich Stravinsky (1882–1971), Russian-born composer ²



“As I think about acts of integrity and grace, I realise that there is nothing in my knowledge to compare with Frege's dedication to truth. His entire life's work was on the verge of completion, much of his work had been ignored to the benefit of men infinitely less capable, his second volume was about to be published, and upon finding that his fundamental assumption was in error, he responded with intellectual pleasure clearly submerging any feelings of personal disappointment. It was almost superhuman and a telling indication of that of which men are capable if their dedication is to creative work and knowledge instead of cruder efforts to dominate and be known.”

Bertrand Russell (1872–1970), British mathematician, in a 1962 November 23 letter to Dr. van Heijenoort. ³



- ¹ quote:  [Housman \(1936\): *More Poems*](#), page 64 (“Smooth Between Sea and Land”),
 [Hardy \(1940\): *A Mathematician's Apology*](#) (section 7)
image: <http://en.wikipedia.org/wiki/Image:Housman.jpg>
- ² quote:  [Ewen \(1961\): *The New Book of Modern Composers*](#), page 408,
 [Ewen \(1950\): *The Book of Modern Composers*](#)
image: http://en.wikipedia.org/wiki/Image:Igor_Stravinsky.jpg
- ³ quote:  [Heijenoort \(1967\): *From Frege to Gödel : A Source Book*](#), page 127
image: <http://www-history.mcs.st-andrews.ac.uk/PictDisplay/Russell.html>

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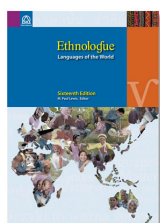
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CHAPTER 1

PHONEMES OF MANDARIN CHINESE

1.1 Languages



As of 2009, there were a total of about 6909 “living languages” in the world. Given that the world currently has very sophisticated travel and communication systems, one might suppose that every spoken language in the world is known and has been documented by linguists. However, it is possible that there are still some living languages in the world unknown to the world community at large. In fact, in 2008, a new language called *Koro* was found in India.¹



One use for studying languages is to help discover the origins of remote social groups. For example, people on the islands in the Pacific ocean speak about 1200 different languages. Scientists at Auckland University have used computer analysis on 400 of these languages and say many of these people originally came from Taiwan thousands of years ago (see Figure 1.1 (page 2)).²

1.2 Consonants and Vowels

A **phoneme** is a basic sound in a language. Phonemes are combined together to form **phones**, or syllable sounds (CHAPTER 2 page 9). English has about 39 **phonemes**; Of these, 24 are **consonants** and 15 are **vowels**.³ Of the vowel sounds, there are about 11 monophthongs and about 4 diphthongs.

The phonemes of English are listed in Table 1.1 (page 4). There, the phonemes are transcribed using

¹ Lewis (2009): *Ethnologue: Languages of the World*

Wilford (2010): *The New York Times*

² <http://language.psy.auckland.ac.nz/austronesian/research.php>

³ Association (1999): *Handbook of the International Phonetic Association...* pages 41–43 (American English)

Prasad (2008): *A Course in Linguistics* page 35

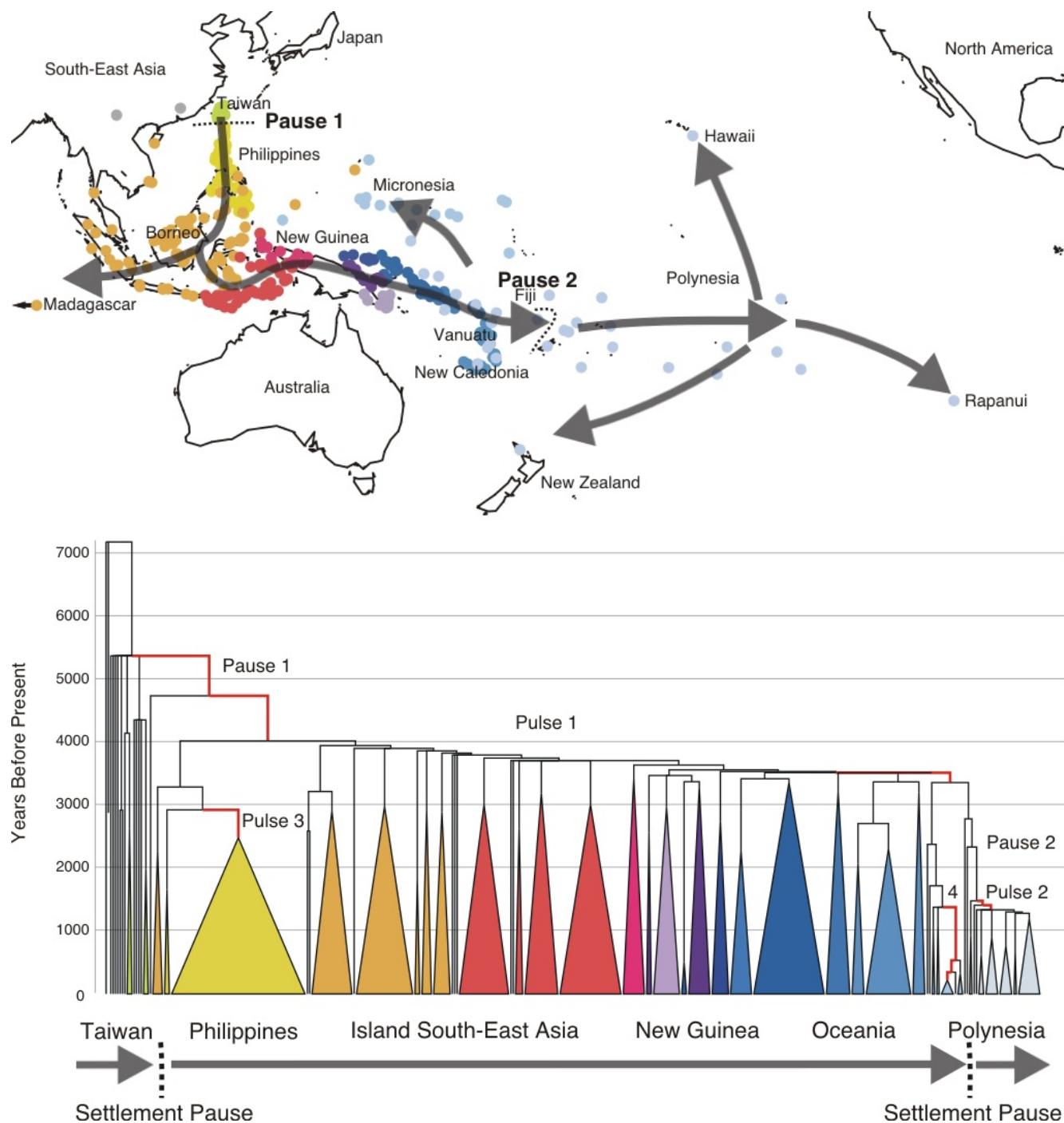


Figure 1.1: Pacific language migration

IPA, KK,⁴ PinYin, and ZhuYin. For help pronouncing the IPA transcription, see

<http://www.internationalphoneticalphabet.org/ipa-sounds/ipa-chart-with-sounds/>
<http://www.ipachart.com/>

Chinese has about 29 **phonemes** (Table 1.2 page 5) Of these, about 23 are **consonants** and about 11 are **vowels**. Of the vowel phonemes, there are about 9 monophthongs (單元音) and about 2 diphthongs (雙元音).

1.3 Phonetic Systems

The challenge with all language scripts, is with what sound a grapheme (a “letter” or “character”) represents. This is a particular problem with logograms, such as the set of Chinese characters. And this is not just a problem faced by non-Chinese persons trying to learn Chinese, but for native Chinese speaking children who are learning to read and write their own language. For this purpose there are several *transcriptions* that provide phonetic support for Chinese characters—that is, phonetic systems that let a reader know how he or she should pronounce a given character. Of these systems, the two most common standard systems are⁵

- ① (based on the Latin alphabet abc...) Section 1.3.1 page 6
- ② (based on other symbols ㄅ ㄆ ㄇ ㄏ ㄒ, etc) Section 1.3.2 page 6


Of these two systems, PinYin tends to be more convenient for Westerners who tend in turn to be more familiar with the Latin alphabet.

These two transcriptions support the sounds of Mandarin Chinese, but not all the sounds of all the known languages in the world. In fact, they do not even support all the phonemes of English. A much more general transcription is the *International Phonetic Alphabet (IPA)*.⁶ Much of this transcription is similar to the Latin alphabet, but uses some non-Latin graphemes as well. IPA transcription can be used to represent the phonemes of Chinese, English, and every other known language that can be made audible by the human vocal system (tongue, teeth, lungs, nasal passages, etc.).

If concern is restricted to English only, then supporting transcriptions include⁷

- ③ CMU (based on the *Carnegie Mellon University Pronouncing Dictionary*)
- ④ BEEP (“British English pronunciations”)
- ⑤ KK (based on Kenyon and Knott's *A Pronouncing Dictionary of American English*).

The transcription KK, it seems, is currently mostly limited in use to Taiwan. The CMU and BEEP transcriptions use only the basic Latin alphabet (A,B,C,...) and therefore are convenient for processing using computers.

⁴  Kenyon and Knott (1949): *A Pronouncing Dictionary of American English*

 Kenyon and Knott (1953): *A Pronouncing Dictionary of American English*

⁵  (1991)/ISO 7098:1991

⁶  Association (1999): *Handbook of the International Phonetic Association...*

⁷  Group: *Carnegie Mellon University Pronouncing Dictionary*

 *BEEP dictionary*

 Kenyon and Knott (1949): *A Pronouncing Dictionary of American English*

 Kenyon and Knott (1953): *A Pronouncing Dictionary of American English*

Table 1.1: Phonemes of English

	Latin	IPA	KK	CMU	PinYin	ZhuYin	example	voiced?
1.	p	p	p	P	p	ㄆ	as in pear	
2.	b	b	b	B	b	ㄆ	as in bear	✓
3.	t	t	t	T	t	ㄊ	as in top	
4.	d	d	d	D	d	ㄊ	as in door	✓
5.	k	k	k	K	k	ㄎ	as in kite	
6.	g	g	g	G	g	ㄍ	as in girl	✓
7.	ch	tʃ	tʃ	CH	q	ㄑ	as in cheese	
8.	j	dʒ	dʒ	JH	j	ㄐ	as in jump	✓
9.	m	m	m	M	m	ㄇ	as in mouse	✓
10.	n	n	n	N	n	ㄋ	as in net	✓
11.	ng	ŋ	ŋ	NG	ng	ㄋ	as in sing	✓
12.	f	f	f	F	f	ㄈ	as in fish	
13.	v	v	v	V			as in vet	✓
14.	th	θ	θ	TH			as in math	
15.	th	ð	ð	DH			as in th	✓
16.	s	s	s	S	s	ㄙ	as in socks	
17.	z	z	z	Z			as in zero	✓
18.	sh	ʃ	ʃ	SH	sh	ㄕ	as in shoe	
19.	z	ʒ	ʒ	ZH			as in azure	✓
20.	h	h	h	HH	h	ㄏ	as in hat	
21.	r	r	r	R			as in rug	✓
22.	y	j	j	Y	y	ㄣ	as in you	✓
23.	w	w	w	W	w	ㄨ	as in wait	✓
24.	l	l	l	L	l	ㄌ	as in late	✓
25.	ee	iː	i	IY	i	ㄣ	as in he	✓
26.	e	ɛ	ɛ	EH			as in red	✓
27.	a	æ	æ	AE			as in cat	✓
28.	i	ɪ	ɪ	IH			as in lid	✓
29.	ir	ɪr	r	ER	er	ㄣ	as in bird	✓
30.	oo	ʊ	U	UH			as in good	✓
31.	ue	u	U	UW	u	ㄨ	as in glue	✓
32.	u	ʌ	ʌ	AH			as in bud	✓
33.	a	ɑ	ɑ	AA	ɑ	ㄚ	as in father	✓
34.	a	ə	ə	AO			as in above	✓
35.	e	e	e	EY	ei	ㄣ	as in bay	✓
36.	i	aɪ	aɪ	AI	ay	ㄣ	as in kite	✓
37.	oa	o	o	OW	ou	ㄣ	as in goat	✓
38.	ow	aʊ	aʊ	AW	ao	ㄣ	as in now	✓
39.	oy	ɔɪ	ɔɪ	OY			as in boy	✓

Table 1.2: Phonemes of Mandarin Chinese

PinYin	ZhuYin	IPA	IPA-TW	CMU	description
1. b	ㄅ	b	b	B	as the b in boy
2. c	ㄘ	ts	ts	TS	as the ts in cats and hats
3. d	ㄉ	d	d	D	as the d in day
4. f	ㄈ	f	f	F	as the f in fade , fin , and fun
5. g	ㄍ	g	g	G	the hard g sound in gather , get , give , and gun
6. h	ㄏ	x	x	HH	the h sound in ha ha or happy
7. j	ㄐ	dʒ	dʒ	JH	the j sound in jay or the g sound in gym
8. k	ㄎ	k	k	K	the k sound in kangaroo or the c sound in cap
9. l	ㄌ	l	l	L	the l sound in label , lime , and low
10. m	ㄇ	m	m	M	the m sound in mayor , meet , mow , and mute
11. n	ㄋ	n	n	N	the n sound in name , new , nine , and no
12. ng	ㄋˊ	ŋ	ŋ	NG	the ng sound in ring
13. p	ㄆ	p	p	P	the p sound in past , pen , pine , and prune
14. q	ㄑ	tʃ	tʃ	CH	the ch sound in chew
15. s	ㄙ	s	s	S	the s sound in sand , send , since , and sun
16. t	ㄊ	t	t	T	the t sound in talk , tent , tick , and tent
17. w	ㄨ	w	w	W	the w sound in walk , went , and win
18. x	ㄒ	ɕ	ɕ		a semi-shrill form of sh
19. y	ㄩ	j	j	Y	the y sound in yellow
20. z	ㄗ	dʒ	dʒ	Z	the z sound in zebra
21. ch	ㄔ	tʂ	tʂ	CH	retroflex sounds (no English equivalent)
22. sh	ㄕ	ʂ	ʂ	SH	retroflex sounds (no English equivalent)
23. zh	ㄗ	ʐ	dʒ	JH	retroflex sounds (no English equivalent)
24. r	ㄖ	ɻ	ɻ	R	retroflex sounds (no English equivalent)
25. a	ㄚ	a	a	AA	as the a in father
26. e	ㄜ	ə	ə	EH	the uh sound as the ai in said
27. er	ㄝ	ɐ	ɐ	ER	the ir sound as in bird
28. i	ㄟ	iː	i	IY	the ee sound as the ee in see
29. o	ㄛ	o	o	UH	the short oh sound as the o in nope
30. u	ㄨ	u	u	UW	as the o sound in do
31. ü	ㄩ	y	y		the ew sound, with lips rounded, similar to the ew sound in ewe (female sheep).
32. ai	ㄞ	aɪ	aɪ	AY	as the i in kite
33. ao	ㄠ	aʊ	aʊ	AW	the ow sound as in cow and now .
34. ei	ㄟ	eɪ	eɪ	EY	as the ay in say
35. o	ㄛ	oʊ	oʊ	OW	the long oh sound as the o in mow

1.3.1 PinYin

The phonemes of PinYin are listed under “PinYin” in Table 1.2 (page 5). Chinese/English dictionaries and phrase books for English speaking people most often use Hanyu PinYin to specify the phonetic pronunciation of Chinese characters.

Hanyu PinYin has been adopted by mainland China as the standard phonetic system for Mandarin Chinese. It has been standardized by the *International Organization for Standardization* as specified in the 1991 standard *ISO 7098:1991*.⁸

hàn	yǔ	pīn	yīn
漢	語	拼	音
漢	語	拼	音
Han dynasty language		piece together sound	
Chinese		pinyin	

1.3.2 ZhuYin

An alternative phonetic system to pinyin is 注音符號 (zhù yīn fú hào), or here referred to simply as *ZhuYin*. The phonemes of ZhuYin are described in Table 1.2 (page 5). Alternative names for ZhuYin include the following:

zhù	yīn	fú	hào
注	音	符	號
注	音	符	號
to annotate sound		symbol mark	
ZhuYin		symbol	

- ① *BoPoMoFo* based on the first four characters of ZhuYin (ㄅ ㄆ ㄇ ㄈ)
- ② *Mandarin Phonetic Symbols I* (國語注音符號第一式)
- ③ *MPS I* (注音符號第一式) — an abbreviation of ②
- ④ *Mandarin Phonetic Symbols* (國語注音符號) — another abbreviation of ②

If you are interested in learning traditional Chinese characters, then you may find learning ZhuYin very much worth your time. There is a huge number of children's books available written using traditional Chinese characters with ZhuYin beside each character. So even if you do not know many Chinese characters, you will still be able to pronounce accurately each character, will be able to look up the meaning of each character in a dictionary, and can have access to a wealth of language learning material. Many such children's books also come with an audio CD, allowing you to also improve your listening comprehension.

Here is a table showing the relationship between ZhuYin and PinYin. Once you know these relationships, you can easily convert the ZhuYin you see in a book to pinyin that is often used in Chinese/English dictionaries.

ㄅ	b	ㄆ	p	ㄇ	m	ㄈ	f	ㄊ	t	ㄋ	n	ㄌ	l	ㄍ	g	ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang	ㄩ	ü
ㄆ	p	ㄇ	m	ㄈ	f	ㄊ	t	ㄋ	n	ㄌ	l	ㄍ	g	ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang				
ㄇ	m	ㄈ	f	ㄊ	t	ㄋ	n	ㄌ	l	ㄍ	g	ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang						
ㄈ	f	ㄊ	t	ㄋ	n	ㄌ	l	ㄍ	g	ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang								
ㄊ	t	ㄋ	n	ㄌ	l	ㄍ	g	ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang										
ㄋ	n	ㄌ	l	ㄍ	g	ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang												
ㄌ	l	ㄍ	g	ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang														
ㄍ	g	ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang																
ㄓ	zh	ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang																		
ㄔ	ch	ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang																				
ㄕ	k	ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang																						
ㄕ	c	ㄕ	s	ㄕ	ei	ㄕ	ang																								
ㄕ	s	ㄕ	ei	ㄕ	ang																										
ㄕ	ei	ㄕ	ang																												
ㄕ	ang																														

Similar to English speaking children's custom of singing the “ABC” song to learn the English alphabet, Chinese speaking children learning ZhuYin often chant the ZhuYin alphabet starting in the upper left corner, going down, and proceeding column by column like this:

⁸ (1991)/ISO 7098:1991

(start) → be → pe → me → fe → de → te →
 → ne → le → ge → ke → he → ji →
 → qi → xi → zhi → chi → shi → re →
 → zi → ci → si → a → o → e →
 → yi → ai → ei → ao → ou → an →
 → en → ang → eng → er → yi → u →
 → ü

Here is an example of a very old and very famous Chinese poem (and more recently, a very famous song as well, Section C.2 page 50) using traditional Chinese characters with ZhuYin phonetic symbols:

明^{ㄇㄨㄣˊ}月^{ㄩㄝˋ}幾^{ㄉㄨㄟˋ}時^{ㄕㄨˊ}有^{ㄩˇ}，把^{ㄅㄚˇ}酒^{ㄐㄩˇ}問^{ㄨㄣˋ}青^{ㄑㄩㄥ}天^{ㄊㄩㄢ}。
 不^{ㄅㄨˋ}知^ㄓ天^{ㄊㄩㄢ}上^{ㄕㄨㄥˋ}宮^{ㄍㄨㄥ}闕^{ㄑㄩㄢˋ}，今^{ㄐㄩㄣ}夕^{ㄒㄧˊ}是^{ㄕㄨˊ}何^{ㄏㄜˊ}年^{ㄋㄢˊ}。
 我^{ㄨㄛˇ}欲^{ㄩˋ}乘^{ㄔㄨㄥ}風^{ㄈㄨㄥ}歸^{ㄍㄨㄟ}去^{ㄑㄩˋ}，又^{ㄚˋ}恐^{ㄎㄨㄥˇ}瓊^{ㄑㄨㄥˊ}樓^{ㄌㄡ}玉^{ㄩˋ}宇^{ㄩˇ}，高^{ㄅㄠ}處^{ㄔㄨˋ}不^{ㄅㄨˋ}勝^{ㄕㄨㄥˊ}寒^{ㄏㄢˊ}。
 起^{ㄑㄩˇ}舞^{ㄨˇ}弄^{ㄋㄨㄥˋ}清^{ㄑㄩㄥ}影^{ㄩㄥˇ}，何^{ㄏㄜˊ}似^{ㄕㄨˊ}在^{ㄗㄞˋ}人^{ㄖㄣˊ}間^{ㄐㄩㄢ}。
 轉^{ㄓㄨㄢˇ}朱^{ㄓㄨ}閣^{ㄍㄜˊ}，低^{ㄉㄧ}綺^{ㄑㄩˇ}戶^{ㄏㄨˋ}，照^{ㄓㄠˋ}無^{ㄨˊ}眠^{ㄇㄢˊ}。
 不^{ㄅㄨˋ}應^{ㄩㄥ}有^{ㄩˇ}恨^{ㄏㄜˋ}，何^{ㄏㄜˊ}事^{ㄕㄨˊ}長^{ㄔㄨㄥˊ}向^{ㄒㄩㄥˋ}別^{ㄅㄧㄝˋ}時^{ㄕㄨˊ}圓^{ㄩㄢˊ}。
 人^{ㄖㄣˊ}有^{ㄩˇ}悲^{ㄅㄟ}歡^{ㄏㄨㄢ}離^{ㄌㄧ}合^{ㄏㄜˊ}，月^{ㄩㄝˋ}有^{ㄩˇ}陰^{ㄩㄢ}晴^{ㄑㄩㄥ}圓^{ㄩㄢˊ}缺^{ㄑㄩㄝˋ}，此^{ㄘㄧˇ}事^{ㄕㄨˊ}古^{ㄍㄨˇ}難^{ㄋㄢˊ}全^{ㄑㄩㄢ}。
 但^{ㄉㄢˋ}願^{ㄩㄢˋ}人^{ㄖㄣˊ}長^{ㄔㄨㄥˊ}久^{ㄐㄩˇ}，千^{ㄑㄩㄢ}里^{ㄌㄩˇ}共^{ㄍㄨㄥˋ}嬋^{ㄔㄨㄢˊ}娟^{ㄐㄩㄢ}。

1.4 Caveats

Note that both PinYin and ZhuYin does have some curiosities and accompanying caveats:

1. One might suppose that the ZhuYin “ㄥ” and PinYin “eng” are always pronounced as the IPA “ɛŋ” (English “ung” as in “rung”) sound. Indeed, it does have this sound in almost every instance when it immediately follows a consonant as in the following examples:

ㄘㄥ	as in	三層	sān céng	(3 floors)
ㄔㄥ	as in	成人	chéng rén	(an adult)
ㄉㄥ	as in	等一下	děng yí xià	(wait a moment)
ㄍㄥ	as in	更多	gèng duō	(even more)
ㄏㄥ	as in	橫的	héng de	(horizontal)
ㄎㄥ	as in	坑道	kēng dào	(a tunnel)
ㄌㄥ	as in	冷凍	lěng dòng	(freezing)
ㄆㄥ	as in	碰見	pèng jiàn	(to meet unexpectedly)
ㄗㄥ	as in	正方	zhèng fāng	(a square)

fēng zhēng
 風 箏
 风 筝
 wind zither
 kite

However, curiously, when it immediately follows the ZhuYin ㄩ or PinYin “ü”, ㄥ takes on the IPA “uŋ” (ZhuYin ㄩㄥ) sound as in 風^{ㄈㄨㄥ}箏^{ㄗㄨㄥ} (see illustration to the left). The character pair 風^{ㄈㄨㄥ}箏^{ㄗㄨㄥ} is especially curious because in the first character 風 the ㄥ is pronounced with the IPA uŋ (similar to the English “ong” as in “song”); but in the second character 箏, the ㄥ is pronounced with the IPA ɛŋ (English “eng”).

2. One might suppose that the ZhuYin “ㄛ” and PinYin “o” are always pronounced as the IPA “o” (English “o” as in “go”) sound. Indeed, it does have this sound in almost every instance when it immediately follows a consonant as in the following examples:

ㄘㄛ	as in	小丑	xiǎo chǒu	(a clown)
ㄌㄛ	as in	綠豆	lǜ dòu	(green bean)
ㄍㄛ	as in	小狗	xiǎo gǒu	(a puppy)

wài pó
 外 婆
 外 婆
 outside old woman
 maternal grandmother

However, curiously, when it immediately follows the ZhuYin ㄨ or PinYin “u”, ㄨ takes on the IPA “uo” (ZhuYin ㄨㄛ) sound as in 外^{ㄨㄛ}婆 or 巫^{ㄨㄛ}婆.

wū pó
 巫 婆
 巫 婆
 sorcery old woman
 witch

1.5 Some vocabulary

ENGLISH	(grammar)	KK	中文	ENGLISH	(grammar)	KK	中文
1. language	(n)	'læŋgwɪɔ̯	語言	9. tone	(n)	ton	聲
2. phone	(n)	fon	聲音	10. tonal	(adj)	'tonl	有聲的
3. sound	(n)	saʊnd	聲音	11. nontonal	(adj)	'nan,tonl	無聲的
4. consonant	(n)	'kansənənt	子音	12. alphabet	(n)	'ælfə,bet	字母
5. vowel	(n)	'vaʊəl	母音	13. script	(n)	skɹɪpt	字母
6. voiced	(adj)	vɔɪst	濁音的	14. grapheme	(n)	'græfɪm	字位
7. voiceless	(adj)	'vɔɪslɪs	清音的	15. character	(n)	'kærɪktə	字位
8. syllable	(n)	'sɪləbl	音節	16. glyph	(n)	glɪf	字形

ENGLISH	(GRAMMAR)	KK	中文
17. phonetics	(n)	fə'netɪks	語音系
18. phoneme	(n)	'fonɪm	音素/音位
19. ideograph	(n)	ɪ'diə,græf	形意文字
20. pictograph	(n)	'pɪktə,græf	象形文字

CHAPTER 2

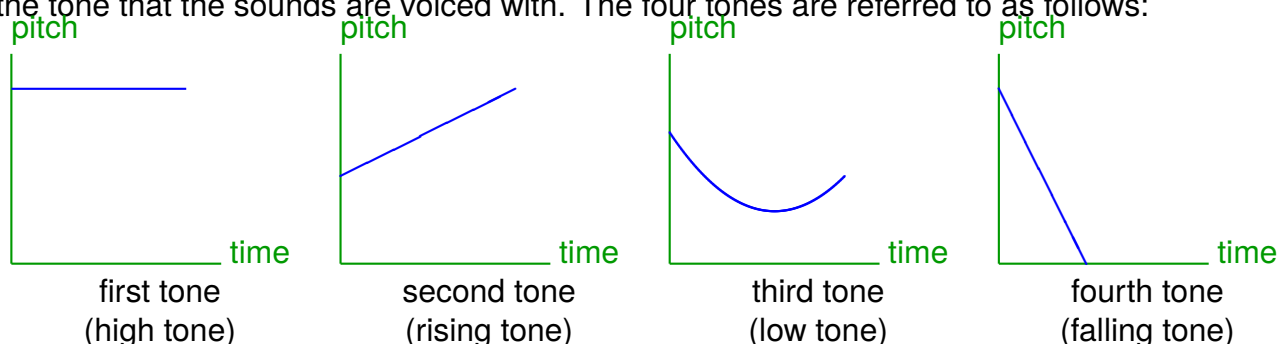
PHONES OF MANDARIN CHINESE

2.1 How many phones do you have?

Chinese has about 401 phones (syllable sounds). English has about 15,831 phones. This result for English is from Chris Barker at New York University's Department of Linguistics. He used the *BEEP Pronouncing Dictionary* which apparently at the time contained "just over" 16,000 words, but now contains over 250,000 words. It can be freely downloaded from <http://svr-www.eng.cam.ac.uk/comp.speech/Section1/Lexical/beep.html> Chris Barker wrote a computer program to find all the syllables in the dictionary.

2.2 Spoken Chinese

Spoken Mandarin Chinese has about 401 syllable sounds (phones). In addition to these sounds, there are four tones plus a neutral tone; in general, meanings of sounds change (greatly) based on the tone that the sounds are voiced with. The four tones are referred to as follows:



As previously mentioned, using the correct tone is important, as the meaning of a character can change drastically with a change of tone, as illustrated by Example 2.1 (next) and Example 2.2 (page 10).

Example 2.1.

	tone	marking	examples		
①	first tone (high tone)	-	mā 媽 妈 mother	bā 八 八 eight	gē 歌 歌 song
②	second tone (rising tone)	ˊ	má 麻 麻 numbness	bá 拔 拔 to uproot	gé 格 格 checks
③	third tone (low tone)	ˇ	mǎ 馬 马 horse	bǎ 把 把 handle	gě 舸 舸 barge
④	fourth tone (falling tone)	ˋ	mà 罵 骂 to scold	bà 爸 爸 dad	gè 各 各 each
⑤	no tone (neutral tone)		ma 麼 么 (for questions)	ba 吧 吧 (for suggestions)	ge 個 个 (quantifier)

Example 2.2.

wǒ ài wǒ de mǔ qīn
我 愛 我的 母 親 ◦
我 爱 我的 母 亲 ◦
I love I 's mother parent
my mother

I love my mother (mǔ qīn).

jīn tiān tā yǒu bǐ sài
今 天 她 有 比 賽 ◦
今 天 她 有 比 赛 ◦
today sky she has compared race
today competition

Today she has a competition (bǐ sài).

wǒ kàn dào yí ge xiǎo tōu
我 看 到 一 个 小 偷 ◦
我 看 到 一 个 小 偷 ◦
I see arrive one one small steal
see a thief

I see a thief (xiǎo tōu).

wǒ ài wǒ de mù qín
我 愛 我的 木 琴 ◦
我 爱 我的 木 琴 ◦
I love I 's wood instrument
my xylophone

I love my xylophone (mù qín).

jīn tiān tā yǒu bí sāi
今 天 她 有 鼻 塞 ◦
今 天 她 有 鼻 塞 ◦
today sky she has nose plug
today stuffy nose

Today she has a stuffy nose (bí sāi).

wǒ kàn dào yí ge xiǎo tóu
我 看 到 一 个 小 頭 ◦
我 看 到 一 个 小 头 ◦
I see arrive one one small head
see a small head

I see a small head (xiǎo tóu).

wǒ tīng bù dǒng nǐ de yǔ yán
 我 聽 不 懂 你 的 語 言
 I hear not understand you 's speech statement
 your language

I don't understand your language (yǔ yán).

wǒ tīng bù dǒng nǐ de yù yán
 我 聽 不 懂 你 的 預 言
 I hear not understand you 's advance statement
 your prediction

I don't understand your prediction (yù yán).

Following is a fairly complete list of the phones (syllable sounds) of Mandarin Chinese.¹ The columns “1, 2, 3, 4, n” represent first tone, second tone, third tone, forth tone, and neutral, respectively. A check (✓) in a column signifies that a character with the given sound (“phone”) and tone exists in Mandarin Chinese. “IPA-n” represents *International Phonetic Alphabet narrow transcription*. “IPA-b” represents *International Phonetic Alphabet broad transcription*. For an audio pronunciation guides of IPA glyphs, see

<http://www.internationalphoneticalphabet.org/ipa-sounds/ipa-chart-with-sounds/>

<http://www.ipachart.com/>

	PinYin	ZhuYin	IPA	1	2	3	4	n		PinYin	ZhuYin	IPA	1	2	3	4	n
1.	a	ㄚ	a	✓				✓✓	2.	ai	ㄞ	ai	✓	✓	✓	✓	
3.	an	ㄢ	an	✓	✓		✓		4.	ang	ㄤ	aŋ	✓	✓		✓	
5.	ao	ㄠ	ao	✓	✓	✓	✓		6.	ba	ㄅ ㄚ	ba	✓	✓	✓	✓	✓
7.	bai	ㄅ ㄞ	bai	✓	✓	✓	✓		8.	ban	ㄅ ㄢ	ban	✓		✓	✓	
9.	bang	ㄅ ㄤ	baŋ	✓		✓	✓		10.	bao	ㄅ ㄠ	bao	✓	✓	✓	✓	
11.	bei	ㄅ ㄟ	be	✓		✓	✓		12.	ben	ㄅ ㄣ	bən	✓		✓	✓	
13.	beng	ㄅ ㄥ	bəŋ	✓	✓	✓	✓		14.	bi	ㄅ ㄧ	bi	✓	✓	✓	✓	
15.	bian	ㄅ ㄧ ㄢ	biən	✓		✓	✓		16.	biao	ㄅ ㄧ ㄠ	biao	✓		✓		
17.	bie	ㄅ ㄧ ㄝ	biɛ	✓	✓	✓	✓		18.	bin	ㄅ ㄧ ㄣ	bin	✓	✓			
19.	bing	ㄅ ㄧ ㄥ	biŋ	✓		✓	✓		20.	bo	ㄅ ㄛ	bo	✓	✓	✓	✓	✓
21.	bu	ㄅ ㄨ	bu			✓	✓		22.	ca	ㄘ ㄚ	tsa	✓				
23.	cai	ㄘ ㄞ	tsai	✓	✓	✓	✓		24.	can	ㄘ ㄢ	tsan	✓	✓	✓	✓	
25.	cang	ㄘ ㄤ	tsaŋ	✓	✓				26.	cao	ㄘ ㄠ	tsao	✓	✓	✓		
27.	ce	ㄘ ㄝ	tsɛ				✓		28.	cen	ㄘ ㄣ	tsən	✓	✓			
29.	ceng	ㄘ ㄥ	tsəŋ			✓			30.	cha	ㄘ ㄚ	tʂa	✓	✓	✓	✓	
31.	chai	ㄘ ㄞ	tʂai	✓	✓				32.	chan	ㄘ ㄢ	tʂan	✓	✓	✓	✓	
33.	chang	ㄘ ㄤ	tʂaŋ	✓	✓	✓	✓		34.	chao	ㄘ ㄠ	tʂao	✓	✓	✓	✓	
35.	che	ㄘ ㄝ	tʂɛ	✓		✓	✓		36.	chen	ㄘ ㄣ	tʂən	✓	✓		✓	
37.	cheng	ㄘ ㄥ	tʂəŋ	✓	✓	✓	✓		38.	chi	ㄘ ㄧ	tʂʃ	✓	✓	✓	✓	
39.	chong	ㄘ ㄨ ㄥ	tʂuŋ	✓	✓	✓	✓		40.	chou	ㄘ ㄨ	tʂou	✓	✓	✓	✓	
41.	chu	ㄘ ㄨ	tʂu	✓	✓	✓	✓		42.	chua	ㄘ ㄨ ㄚ	tʂua	✓				
43.	chuai	ㄘ ㄨ ㄞ	tʂuai			✓	✓		44.	chuan	ㄘ ㄨ ㄢ	tʂuan	✓	✓	✓	✓	

¹ 葉德明 (2000): *Far East Pinyin Chinese-English Dictionary: 遠東拼音漢英辭典*

Shibles (1994): *Sino-Platonic Papers*

45.	chuang	ㄔㄨㄤ	ʈʂuɑŋ	✓✓✓✓	46.	chui	ㄔㄨㄟ	ʈʂui	✓✓
47.	chun	ㄔㄨㄣ	ʈʂun	✓✓✓	48.	chuo	ㄔㄨㄛ	ʈʂuo	✓✓
49.	ci	ㄘ	ʈʂ	✓✓✓✓	50.	cong	ㄘㄨㄥ	ʈʂuŋ	✓✓
51.	cou	ㄘㄡ	tso	✓✓✓	52.	cu	ㄘㄨ	tsu	✓✓✓
53.	cuan	ㄘㄨㄢ	ʈʂuan	✓✓✓	54.	cui	ㄘㄨㄟ	tsue	✓✓✓
55.	cun	ㄘㄨㄣ	ʈʂun	✓✓✓✓	56.	cuo	ㄘㄨㄛ	tsuo	✓✓
57.	da	ㄉㄚ	da	✓✓✓✓	58.	dai	ㄉㄞ	dai	✓✓✓
59.	dan	ㄉㄢ	dan	✓✓✓	60.	dang	ㄉㄤ	daŋ	✓✓✓
61.	dao	ㄉㄠ	dao	✓✓✓	62.	de	ㄉㄜ	dɛ	✓✓✓
63.	dei	ㄉㄟ	de	✓✓✓	64.	deng	ㄉㄥ	dɑŋ	✓✓✓
65.	di	ㄉ	di	✓✓✓✓	66.	dian	ㄉㄢ	diɛn	✓✓✓
67.	diao	ㄉㄠ	diao	✓✓✓	68.	die	ㄉㄟ	diɛ	✓✓✓
69.	ding	ㄉㄩㄥ	din	✓✓✓	70.	diu	ㄉㄨ	diu	✓✓✓
71.	dong	ㄉㄨㄥ	duŋ	✓✓✓	72.	dou	ㄉㄡ	do	✓✓✓
73.	du	ㄉㄨ	du	✓✓✓✓	74.	duan	ㄉㄨㄢ	duan	✓✓✓
75.	dui	ㄉㄨㄟ	due	✓✓✓	76.	dun	ㄉㄨㄣ	dun	✓✓✓
77.	duo	ㄉㄨㄛ	duo	✓✓✓✓	78.	e	ㄜ	ɛ	✓✓✓✓
79.	en	ㄣ	ən	✓✓✓	80.	er	ㄦ	ɛr	✓✓✓
81.	fa	ㄈㄚ	fa	✓✓✓✓	82.	fan	ㄈㄢ	fan	✓✓✓✓
83.	fang	ㄈㄤ	faŋ	✓✓✓✓	84.	fei	ㄈㄟ	fe	✓✓✓✓
85.	fen	ㄈㄣ	fən	✓✓✓✓	86.	feng	ㄈㄥ	fuŋ	✓✓✓✓
87.	fo	ㄈㄛ	fɔ	✓✓✓	88.	fou	ㄈㄡ	fɔu	✓✓✓
89.	fu	ㄈㄨ	fu	✓✓✓✓	90.	ga	ㄍㄚ	ga	✓✓✓
91.	gai	ㄍㄞ	gai	✓✓✓	92.	gan	ㄍㄢ	gan	✓✓✓
93.	gang	ㄍㄤ	gaŋ	✓✓✓	94.	gao	ㄍㄠ	gao	✓✓✓
95.	ge	ㄍㄜ	gɛ	✓✓✓✓	96.	gei	ㄍㄟ	ge	✓✓✓
97.	gen	ㄍㄣ	gən	✓✓✓	98.	geng	ㄍㄥ	gɑŋ	✓✓✓
99.	gong	ㄍㄨㄥ	guŋ	✓✓✓	100.	gou	ㄍㄡ	gɔu	✓✓✓
101.	gu	ㄍㄨ	gu	✓✓✓✓	102.	gua	ㄍㄨㄚ	gua	✓✓✓
103.	guai	ㄍㄨㄞ	guai	✓✓✓	104.	guan	ㄍㄨㄢ	guan	✓✓✓
105.	guang	ㄍㄨㄤ	guaŋ	✓✓✓	106.	gui	ㄍㄨㄟ	gue	✓✓✓
107.	gun	ㄍㄨㄣ	gun	✓✓✓	108.	guo	ㄍㄨㄛ	guo	✓✓✓✓
109.	ha	ㄏㄚ	xa	✓✓✓	110.	hai	ㄏㄞ	xai	✓✓✓✓
111.	han	ㄏㄢ	xan	✓✓✓✓	112.	hang	ㄏㄤ	xaŋ	✓✓✓
113.	hao	ㄏㄠ	xao	✓✓✓	114.	he	ㄏㄜ	xɛ	✓✓✓
115.	hei	ㄏㄟ	xe	✓✓✓	116.	hen	ㄏㄣ	xən	✓✓✓
117.	heng	ㄏㄥ	xɑŋ	✓✓✓	118.	hong	ㄏㄨㄥ	xuŋ	✓✓✓✓
119.	hou	ㄏㄡ	xɔ	✓✓✓	120.	hu	ㄏㄨ	xu	✓✓✓✓
121.	hua	ㄏㄨㄚ	xua	✓✓✓	122.	huai	ㄏㄨㄞ	xuai	✓✓✓
123.	huan	ㄏㄨㄢ	xuan	✓✓✓✓	124.	huang	ㄏㄨㄤ	xuaŋ	✓✓✓✓
125.	hui	ㄏㄨㄟ	xue	✓✓✓✓	126.	hun	ㄏㄨㄣ	xun	✓✓✓✓
127.	huo	ㄏㄨㄛ	xuɔ	✓✓✓✓	128.	ji	ㄐ	dʒi	✓✓✓✓
129.	jia	ㄐㄚ	dʒia	✓✓✓✓	130.	jian	ㄐㄢ	dʒiɛn n	✓✓✓✓
131.	jiang	ㄐㄤ	dʒiaŋ ŋ	✓✓✓	132.	jiao	ㄐㄠ	dʒiao o	✓✓✓✓
133.	jie	ㄐㄜ	dʒiɛ	✓✓✓✓	134.	jin	ㄐㄣ	dʒɪn	✓✓✓
135.	jing	ㄐㄥ	dʒɪŋ	✓✓✓	136.	jiong	ㄐㄨㄥ	dʒiɔŋ ŋ	✓✓✓
137.	jiu	ㄐㄡ	dʒiu	✓✓✓	138.	ju	ㄐㄨ	dʒy	✓✓✓✓
139.	juan	ㄐㄨㄢ	dʒyan n	✓✓✓	140.	jue	ㄐㄨㄟ	dʒyɛ	✓✓✓
141.	jun	ㄐㄨㄣ	dʒyn	✓✓✓	142.	ka	ㄎㄚ	ka	✓✓✓
143.	kai	ㄎㄞ	kai	✓✓✓	144.	kan	ㄎㄢ	kan	✓✓✓
145.	kang	ㄎㄤ	kaŋ	✓✓✓✓	146.	kao	ㄎㄠ	kao	✓✓✓

147.	ke	ㄎㄜ	kɑ	✓✓✓✓	148.	ken	ㄎㄣ	kən	✓✓
149.	keng	ㄎㄥ	kɑŋ	✓✓	150.	kong	ㄎㄨㄥ	kun̩	✓✓✓
151.	kou	ㄎㄡ	ko	✓✓✓	152.	ku	ㄎㄨ	ku	✓✓✓
153.	kua	ㄎㄨㄚ	kua	✓✓✓	154.	kuai	ㄎㄨㄞ	kuai	✓
155.	kuan	ㄎㄨㄢ	kuan	✓✓	156.	kuang	ㄎㄨㄤ	kuang	✓✓✓
157.	kui	ㄎㄨㄟ	kue	✓✓✓✓	158.	kun	ㄎㄨㄣ	kun	✓✓✓
159.	kuo	ㄎㄨㄛ	kuo	✓	160.	la	ㄌㄚ	la	✓✓✓✓✓
161.	lai	ㄌㄞ	lai	✓✓	162.	lan	ㄌㄢ	lan	✓✓✓✓
163.	lang	ㄌㄤ	laŋ	✓✓✓	164.	lao	ㄌㄠ	lao	✓✓✓✓
165.	le	ㄌㄜ	lɤ	✓✓✓	166.	lei	ㄌㄟ	le	✓✓✓✓
167.	leng	ㄌㄥ	lɑŋ	✓✓✓	168.	li	ㄌㄧ	li	✓✓✓✓✓
169.	lia	ㄌㄧㄚ	lia	✓	170.	lian	ㄌㄧㄢ	lien	✓✓✓✓
171.	liang	ㄌㄧㄤ	liɑŋ	✓✓✓	172.	liao	ㄌㄧㄠ	liao	✓✓✓✓
173.	lie	ㄌㄧㄝ	lie	✓✓✓✓	174.	lin	ㄌㄧㄣ	lin	✓✓✓✓
175.	ling	ㄌㄧㄥ	liŋ	✓✓✓✓	176.	liu	ㄌㄧㄡ	liu	✓✓✓✓
177.	long	ㄌㄨㄥ	luŋ	✓✓✓	178.	lou	ㄌㄡ	lo	✓✓✓✓✓
179.	lu	ㄌㄨ	lu	✓✓✓	180.	lū	ㄌㄨ	ly	✓✓✓
181.	lūe	ㄌㄨㄝ	lyɤ	✓	182.	luan	ㄌㄨㄢ	luan	✓✓✓
183.	lun	ㄌㄨㄣ	lun	✓✓✓	184.	luo	ㄌㄨㄛ	luo	✓✓✓✓
185.	ma	ㄇㄚ	ma	✓✓✓✓✓	186.	mai	ㄇㄞ	mai	✓✓✓
187.	man	ㄇㄢ	man	✓✓✓	188.	mang	ㄇㄤ	maŋ	✓✓
189.	mao	ㄇㄠ	mao	✓✓✓✓	190.	me	ㄇㄜ	mə	✓
191.	mei	ㄇㄟ	me	✓✓✓	192.	men	ㄇㄣ	men	✓✓✓
193.	meng	ㄇㄥ	mɑŋ	✓✓✓✓	194.	mi	ㄇㄧ	mi	✓✓✓✓
195.	mian	ㄇㄧㄢ	mien	✓✓✓	196.	miao	ㄇㄧㄠ	miao	✓✓✓
197.	mie	ㄇㄧㄝ	mie	✓✓	198.	min	ㄇㄧㄣ	min	✓✓
199.	ming	ㄇㄧㄥ	miŋ	✓✓✓	200.	miu	ㄇㄧㄡ	miu	✓
201.	mo	ㄇㄛ	mo	✓✓✓✓	202.	mou	ㄇㄡ	mou	✓✓✓
203.	mu	ㄇㄨ	mu	✓✓✓	204.	na	ㄋㄚ	na	✓✓✓✓
205.	nai	ㄋㄞ	nai	✓✓	206.	nan	ㄋㄢ	nan	✓✓✓
207.	nang	ㄋㄤ	naŋ	✓✓	208.	nao	ㄋㄠ	nao	✓✓✓
209.	ne	ㄋㄜ	nə	✓✓	210.	nei	ㄋㄟ	ne	✓✓
211.	nen	ㄋㄣ	nən	✓	212.	neng	ㄋㄥ	nɑŋ	✓✓
213.	ni	ㄋㄧ	ni	✓✓✓	214.	nian	ㄋㄧㄢ	nien	✓✓✓✓
215.	niang	ㄋㄧㄤ	niɑŋ	✓✓	216.	niao	ㄋㄧㄠ	niao	✓✓
217.	nie	ㄋㄧㄝ	nie	✓✓	218.	nin	ㄋㄧㄣ	nin	✓✓
219.	ning	ㄋㄧㄥ	niŋ	✓✓✓	220.	niu	ㄋㄧㄡ	niu	✓✓✓✓
221.	nong	ㄋㄨㄥ	nuŋ	✓✓✓	222.	nou	ㄋㄡ	nou	✓✓✓✓
223.	nu	ㄋㄨ	nu	✓✓✓	224.	nū	ㄋㄨ	ny	✓✓
225.	nuan	ㄋㄨㄢ	nuan	✓	226.	nūe	ㄋㄨㄝ	nye	✓
227.	nuo	ㄋㄨㄛ	nuo	✓✓✓	228.	o	ㄛ	o	✓✓
229.	ou	ㄛ	o	✓✓✓	230.	pa	ㄆㄚ	pa	✓✓✓
231.	pai	ㄆㄞ	pai	✓✓✓	232.	pan	ㄆㄢ	pan	✓✓✓
233.	pang	ㄆㄤ	paŋ	✓✓✓	234.	pao	ㄆㄠ	pao	✓✓✓
235.	pei	ㄆㄟ	pe	✓✓✓	236.	pen	ㄆㄣ	pən	✓✓✓
237.	peng	ㄆㄥ	pɑŋ	✓✓✓✓	238.	pi	ㄆㄧ	pi	✓✓✓✓
239.	pian	ㄆㄧㄢ	pien	✓✓✓	240.	piao	ㄆㄧㄠ	piao	✓✓✓✓
241.	pin	ㄆㄧㄣ	pin	✓✓✓✓	242.	ping	ㄆㄧㄥ	piŋ	✓✓✓
243.	po	ㄆㄛ	pɔ	✓✓✓✓	244.	pou	ㄆㄡ	po	✓✓
245.	pu	ㄆㄨ	pu	✓✓✓✓	246.	qi	ㄑㄧ	tʃi	✓✓✓✓
247.	qia	ㄑㄧㄚ	tʃia	✓✓✓✓	248.	qian	ㄑㄧㄢ	tʃien	✓✓✓✓

249.	qiang	ㄑ ㄣ ㄑ ㄨ ㄤ	tʃian	✓✓✓✓	250.	qiao	ㄑ ㄣ ㄠ	tʃiao	✓✓✓✓
251.	qie	ㄑ ㄣ ㄞ	tʃie	✓✓✓✓	252.	qin	ㄑ ㄣ ㄣ	tʃin	✓✓✓✓
253.	qing	ㄑ ㄣ ㄥ	tʃin	✓✓✓✓	254.	qiong	ㄑ ㄣ ㄥ	tʃiun	✓✓
255.	qiu	ㄑ ㄣ ㄩ	tʃio	✓✓✓	256.	qū	ㄑ ㄣ	tʃy	✓✓✓✓
257.	quan	ㄑ ㄣ ㄩ ㄢ	tʃyan	✓✓✓✓	258.	que	ㄑ ㄣ ㄞ	tʃyɛ	✓✓✓
259.	qun	ㄑ ㄣ ㄣ	tʃyn	✓	260.	ran	ㄣ ㄢ	ʃan	✓✓
261.	rang	ㄣ ㄤ	ʃan	✓✓✓✓	262.	rao	ㄣ ㄠ	ʃao	✓✓✓
263.	re	ㄣ ㄞ	ʃɤ	✓✓✓	264.	ren	ㄣ ㄣ	ʃən	✓✓✓
265.	reng	ㄣ ㄥ	ʃan	✓✓	266.	ri	ㄣ	ʃ	✓
267.	rong	ㄣ ㄨ ㄥ	ʃun	✓✓	268.	rou	ㄣ ㄩ	ʃo	✓✓✓
269.	ru	ㄣ ㄩ	ʃu	✓✓✓	270.	ruan	ㄣ ㄨ ㄢ	ʃuan	✓
271.	rui	ㄣ ㄨ ㄣ	ʃue	✓✓	272.	run	ㄣ ㄨ ㄣ	ʃʌn	✓
273.	ruo	ㄣ ㄨ ㄞ	ʃuo	✓	274.	sa	ㄣ ㄩ	sa	✓✓✓
275.	sai	ㄣ ㄩ	sai	✓✓	276.	san	ㄣ ㄢ	san	✓✓✓
277.	sang	ㄣ ㄤ	san	✓✓✓	278.	sao	ㄣ ㄠ	sao	✓✓✓
279.	se	ㄣ ㄞ	sɤ	✓	280.	sen	ㄣ ㄣ	sən	✓
281.	seng	ㄣ ㄥ	sʌn	✓	282.	sha	ㄣ ㄩ	ʃa	✓✓✓✓
283.	shai	ㄣ ㄩ	ʃai	✓✓✓	284.	shan	ㄣ ㄢ	ʃan	✓✓✓
285.	shang	ㄣ ㄤ	ʃan	✓✓✓	286.	shao	ㄣ ㄠ	ʃao	✓✓✓✓
287.	she	ㄣ ㄞ	ʃʌ	✓✓✓✓	288.	shei	ㄣ ㄣ	ʃe	✓
289.	shen	ㄣ ㄣ	ʃən	✓✓✓✓	290.	sheng	ㄣ ㄥ	ʃʌn	✓✓✓✓
291.	shi	ㄣ	ʃʌ	✓✓✓✓✓	292.	shou	ㄣ ㄩ	ʃo	✓✓✓✓
293.	shu	ㄣ ㄩ	ʃu	✓✓✓✓	294.	shua	ㄣ ㄨ ㄩ	ʃua	✓✓✓
295.	shuai	ㄣ ㄨ ㄩ	ʃuai	✓✓✓	296.	shuan	ㄣ ㄨ ㄢ	ʃuan	✓✓
297.	shuang	ㄣ ㄨ ㄤ	ʃuan	✓✓	298.	shui	ㄣ ㄨ ㄣ	ʃue	✓✓✓
299.	shun	ㄣ ㄨ ㄣ	ʃun	✓✓	300.	shuo	ㄣ ㄨ ㄞ	ʃuo	✓✓
301.	si	ㄣ	sw	✓✓✓	302.	song	ㄣ ㄨ ㄥ	sun	✓✓✓
303.	sou	ㄣ ㄩ	so	✓✓✓	304.	su	ㄣ ㄩ	su	✓✓✓
305.	suan	ㄣ ㄨ ㄢ	suan	✓✓	306.	sui	ㄣ ㄨ ㄣ	sue	✓✓✓✓
307.	sun	ㄣ ㄨ ㄣ	sun	✓✓✓	308.	suo	ㄣ ㄨ ㄞ	suo	✓✓✓
309.	ta	ㄣ ㄩ	ta	✓✓✓	310.	tai	ㄣ ㄩ	tai	✓✓✓
311.	tan	ㄣ ㄢ	tan	✓✓✓✓	312.	tang	ㄣ ㄤ	tan	✓✓✓✓
313.	tao	ㄣ ㄠ	tao	✓✓✓✓	314.	te	ㄣ ㄞ	tɛ	✓✓✓
315.	teng	ㄣ ㄥ	tʌn	✓	316.	ti	ㄣ	ti	✓✓✓✓
317.	tian	ㄣ ㄣ ㄢ	tiɛn	✓✓✓	318.	tiao	ㄣ ㄣ ㄠ	tiao	✓✓✓✓
319.	tie	ㄣ ㄣ ㄞ	tiɛ	✓✓	320.	ting	ㄣ ㄣ ㄥ	tin	✓✓✓✓
321.	tong	ㄣ ㄣ ㄥ	tun	✓✓✓✓	322.	tou	ㄣ ㄩ	to	✓✓✓
323.	tu	ㄣ ㄩ	tu	✓✓✓✓	324.	tuan	ㄣ ㄨ ㄢ	tuan	✓✓✓
325.	tui	ㄣ ㄨ ㄣ	tuei	✓✓✓✓	326.	tun	ㄣ ㄨ ㄣ	tʌn	✓✓✓
327.	tuo	ㄣ ㄨ ㄞ	tuo	✓✓✓✓	328.	wa	ㄨ ㄩ	wa	✓✓✓✓✓
329.	wai	ㄨ ㄩ	wai	✓✓✓	330.	wan	ㄨ ㄢ	wan	✓✓✓✓
331.	wang	ㄨ ㄤ	wʌn	✓✓✓✓	332.	wei	ㄨ ㄣ	we	✓✓✓✓
333.	wen	ㄨ ㄣ	wən	✓✓✓✓	334.	weng	ㄨ ㄥ	wʌn	✓✓✓✓
335.	wo	ㄨ ㄞ	wo	✓✓✓	336.	wu	ㄨ	wu	✓✓✓✓
337.	xi	ㄣ	xi	✓✓✓✓	338.	xia	ㄣ ㄣ ㄩ	ɕia	✓✓✓✓
339.	xian	ㄣ ㄣ ㄢ	ɕiɛn	✓✓✓✓	340.	xiang	ㄣ ㄣ ㄤ	ɕiɛn	✓✓✓✓
341.	xiao	ㄣ ㄣ ㄠ	ɕiao	✓✓✓✓	342.	xie	ㄣ ㄣ ㄞ	ɕiɛ	✓✓✓✓
343.	xin	ㄣ ㄣ ㄣ	ɕin	✓✓✓✓	344.	xing	ㄣ ㄣ ㄥ	ɕin	✓✓✓✓
345.	xiong	ㄣ ㄣ ㄥ	ɕiʌn	✓✓✓	346.	xiu	ㄣ ㄣ ㄩ	ɕio	✓✓✓✓
347.	xu	ㄣ ㄣ	ɕy	✓✓✓✓	348.	xuan	ㄣ ㄣ ㄢ	ɕuan	✓✓✓✓
349.	xue	ㄣ ㄣ ㄞ	ɕyɛ	✓✓✓✓	350.	xun	ㄣ ㄣ ㄣ	ɕyn	✓✓✓✓

351.	ya	— 丫	ja	✓✓✓✓✓	352.	yai	— 𠂇	jaɪ	✓
353.	yan	— 𠂇	jen	✓✓✓✓	354.	yang	— 尤	jaŋ	✓✓✓✓
355.	yao	— 幺	jao	✓✓✓✓	356.	ye	— ㄝ	jɛ	✓✓✓✓
357.	yi	—	ji	✓✓✓✓	358.	yin	— ㄣ	jin	✓✓✓✓
359.	ying	— ㄥ	jɪŋ	✓✓✓✓	360.	yong	ㄣ ㄥ	jɔŋ	✓✓✓✓
361.	you	— 又	ju	✓✓✓✓	362.	yu	ㄣ	jy	✓✓✓✓
363.	yuan	ㄣ 𠂇	jyan	✓✓✓✓	364.	yue	ㄣ ㄝ	jyɛ	✓✓✓
365.	yun	ㄣ ㄣ	jyn	✓✓✓✓	366.	za	ㄖ ㄩ	dza	✓
367.	zai	ㄖ 𠂇	dzaɪ	✓✓✓✓	368.	zan	ㄖ 𠂇	dzan	✓✓✓✓
369.	zang	ㄖ 尤	dzaŋ	✓✓✓✓	370.	zao	ㄖ 幺	dzao	✓✓✓✓
371.	ze	ㄖ ㄜ	dzɤ	✓✓✓✓	372.	zei	ㄖ ㄣ	dze	✓✓✓✓
373.	zen	ㄖ ㄣ	dzen	✓✓✓✓	374.	zeng	ㄖ ㄥ	dzɛŋ	✓✓✓✓
375.	zha	ㄗ ㄩ	za	✓✓✓✓	376.	zhai	ㄗ 𠂇	zaɪ	✓✓✓✓
377.	zhan	ㄗ 𠂇	zan	✓✓✓✓	378.	zhang	ㄗ 尤	zaŋ	✓✓✓✓
379.	zhao	ㄗ 幺	zao	✓✓✓✓	380.	zhe	ㄗ ㄜ	zɤ	✓✓✓✓
381.	zhen	ㄗ ㄣ	zen	✓✓✓✓	382.	zheng	ㄗ ㄥ	zɛŋ	✓✓✓✓
383.	zhi	ㄗ	zɪ	✓✓✓✓	384.	zhong	ㄗ ㄨ ㄥ	zun	✓✓✓✓
385.	zhou	ㄗ 又	zɔu	✓✓✓✓	386.	zhu	ㄗ ㄨ	zɯ	✓✓✓✓
387.	zhua	ㄗ ㄨ ㄩ	zua	✓✓✓✓	388.	zhuai	ㄗ ㄨ 𠂇	zuai	✓✓✓✓
389.	zhuan	ㄗ ㄨ 𠂇	zuan	✓✓✓✓	390.	zhuang	ㄗ ㄨ 尤	zuang	✓✓✓✓
391.	zhui	ㄗ ㄨ ㄣ	zui	✓✓✓✓	392.	zhun	ㄗ ㄨ ㄣ	zun	✓✓✓✓
393.	zhuo	ㄗ ㄨ ㄜ	zuo	✓✓✓✓	394.	zi	ㄗ	dzu	✓✓✓✓
395.	zong	ㄗ ㄨ ㄥ	dzuŋ	✓✓✓✓	396.	zou	ㄗ 又	dzo	✓✓✓✓
397.	zu	ㄗ ㄨ	dzu	✓✓✓✓	398.	zuan	ㄗ ㄨ 𠂇	dzuɛn	✓✓✓✓
399.	zui	ㄗ ㄨ ㄣ	dzui	✓✓✓✓	400.	zun	ㄗ ㄨ ㄣ	dzun	✓✓✓✓
401.	zuo	ㄗ ㄨ ㄜ	dzuo	✓✓✓✓					



CHAPTER 3

GRAPHEMES OF MANDARIN CHINESE

3.1 Language scripts

Many spoken languages also have written forms, which express information in terms of symbols, called *graphemes*. Linguists roughly classify written languages into two categories based on the graphemes that they use:

- ① *phonograms* (or *phonographs*) symbols represent sounds
- ② *logogram* (or *logographs*) graphemes represent words

The advantage of a phonogram is that it is somewhat easier to know how a grapheme “sounds”, but relatively more difficult to know what it means. The advantage of a logogram is that it is somewhat easier to know what a grapheme means, but relatively more difficult to know how it “sounds”.

Examples of Phonographic languages include all the written languages based on the *Latin alphabet* such as English, German, Spanish, French, etc., as well as Greek and other languages. One of the most famous examples, howbeit not currently in common use, of a logograph is *Egyptian hieroglyphics*, a language that the entire world forgot how to read until the discovery of the *Rosetta Stone* by Napoleon’s troops and subsequent decipherment by *Thomas Young* and *Jean-Francois Champollion*.

Example 3.1 (U.S. National Park Service). And the *U.S. National Park Service* uses a kind of logographic language, as illustrated in Figure 3.1 (page 18).¹

In any written language (a script), each basic written picture is called a **grapheme**. In English, a grapheme is usually called a “letter”. In Chinese, a grapheme is usually called a “character”. In general there are many ways to render (or draw) any given grapheme. Each such rendering is called a **glyph**.

Example 3.2 (The “a” grapheme).

In English, all these **glyphs** (font typefaces) represent the same **grapheme** (character):

Œ, a, a, a, a, a

Example 3.3 (The 山 grapheme).²

¹http://en.wikipedia.org/wiki/File:National_Park_Service_sample_pictographs.svg

² FireFly font: 山; UKai font: 山; Han Wang CC02 font: 山; HanWangKanDaYan font: 山;

3.2 Chinese glyphs

By far the most commonly used logographic language in the world today is Chinese. This logograph, as far as current common use is concerned, comes in two forms, *traditional Chinese* and *simplified Chinese*. In much of this text, typesetting is performed as illustrated to the right with PinYin (see Section 1.3.1 page 6) on top, the traditional character below that, the simplified character below that, and English meanings below that.

jiàn
見
見
to see

Because Chinese is a *logographic* language, sometimes one can make an educated guess as to the meaning of a grapheme (called a *character* for the Chinese written language) by the way it “looks”. For example, the character 山 means “mountain”, and it kind of looks like a three peak mountain. In some older forms, the resemblance is even closer (see Example 3.3 page 17).

shān
山
山
mountain

But this only really works for some characters. Over the centuries since the publication in 121 A.D. of 說文解字 (Shuō Wén Jiě Zì) by 許慎 (Xǔ Shèn), characters are often organized into these six categories:⁴

① pictographs xiàng xíng 象 形 象 形 appearance shape	② ideographs zhǐ shì 指 事 指 事 finger affair	③ associative compounds huì yì 會 意 會 意 to meet meaning
④ phonetic compounds xíng shēng 形 聲 形 聲 shape sound	⑤ false borrowings jiě jià 假 借 假 借 false to borrow	⑥ semantic derivations zhuǎn zhù 轉 注 轉 注 to turn to pour

Example 3.6 (pictographs). Here are some examples of *pictographs*:

shuǐ 水 水 water streams flowing together	rén 人 人 person a person standing two legs	rén 儿 儿 person the two legs of a person
rù 入 入 to enter roots descending into the ground	lì 力 力 force a tendon	dāo 刀 刀 knife a knife
dīng 丁 丁 nail a nail	jī 几 几 small table a small table or stool	dà 大 大 big resembles a standing person with open arms

⁴ ④ Ross and Heng Sheng Ma (2006): *Modern Mandarin Chinese Grammar: A Practical Guide* pages 14–15
 ⑤ Harbaugh (2009): 中文字譜 *Chinese Characters: A Genealogy and Dictionary*
 ⑥ 許慎 (121): 說文解字注 (*Shuō Wén Jiě Zì Zhù*, *Explanatory Notes of Chinese Characters*)

shī 尸 尸 corpse	resembles a person lying down	yì 弋 弋 stake	a stake	jī 几 几 stool	a stool or workbench
fán 凡 凡 all	earlier form was an encompassing square	gān 干 干 shield	a shield	gōng 工 工 work	a carpenter's square
fāng 匚 匚	a hollowed out piece of wood	jīn 巾 巾 cloth	a hanging handkerchief	nǚ 女 女 woman	a kneeling woman
zǐ 子 子 son	an infant with legs bundled together	yě 也 也 also	an ancient funnel or wash basin	jiàn 見 見 to see	resembles an eye
kǒu 口 口 mouth	resembles an open mouth	mù 木 木 wood/tree	resembles a tree	kū 哭 哭 to cry	resembles a person with two tear drops in the eyes
qù 去 去 to go	resembles a walking person	shān 山 山 mountain	resembles a three peak mountain	shàng 上 上 above	the vertical and small strokes are <i>above</i> the long horizontal stroke
xià 下 下 below	the diagonal and small strokes are <i>below</i> the long horizontal stroke	xiào 笑 笑 to smile	resembles a smiling person with a moustache	zhǎo 爪 爪 claw/talon	resembles the claw of an animal (e.g. lion)

Moreover, complex characters are sometimes constructed from more primitive ones. If you know the meaning of the primitive characters, it can help suggest the meaning of some complex ones.

Example 3.7 (Complex from primitive).

lín 林 林 forest	resembles two trees (木) as in 林=木+木.	sēn 森 森 trees	resembles three trees as in 森=木+木+木
xiān 仙 仙 celestial being	resembles a man (亻, rén) of the mountains (山, shān).	hǎo 好 好 good	life is good for a man who has a wife (女=woman, nǚ) and son (子, zǐ)
bǎo 保 保 to protect	a man (亻, rén) with a baby (呆, dāi)	chuán 船 船 boat	chuán = zhou + bā + kǒu ; ⁵ 船 舟 八 口 船 舟 八 口 boat boat boat 8 mouth

3.3 Onomatopoeia characters

Despite Chinese being a logographic language and therefore characters represent meanings rather than sounds, there are some characters that, although they have meanings, are not primarily used for those meanings, but rather are primarily used just for the sound that they make. That is, these characters represent *onomatopoeias*. Most of these characters contain the 口 (kǒu, mouth) character, indicating that the character represents a sound (made with the mouth). If you wish to write, say, stories for children, then such characters may come in very handy. Table 3.3 provides some examples of such characters, while Example 3.8 (page 23) illustrates their use with sentences.⁶

Table 3.3: Onomatopoeias characters

ā 啊 啊	the “ah” sound made such as when scared	āi 哎 哎	the expression “hey” or “ah”; can be used together with 唷 as an exclamation as in 哎唷! (āi yó!)
aó 嗷 嗷 cry of hunger	嗷=口+敖 (ào, proud)	bā 叭 叭 trumpet	the honking sound of a car; 叭=口+八 (bā, 8)
bā 吧 吧 (a particle)		bì 嗶 嗶	the “beep” sound of a whistle
chī 嗤 嗤 to sneer	sound of ripping paper	dāng 噹 噹	metallic crashing sound
dīng 叮 叮 to sting	used with 咚 (dōng) for the “ding-dong” sound of a doorbell	dōng 咚 咚	sound of a drum, sound of falling object impacting the ground
dū 嘟 嘟	the “toot” sound of vehicles such as trains; 嘟=口+都 (dū, big city)	gā 嘎 嘎	the “quack quack” sound of ducks as in “嘎嘎”
gé 咯 咯 a click	a click	gū 咕 咕 to murmur	the hooting sound of an owl, the crowing sound of a rooster

⁵ 船 = 舟+八+口: Interestingly enough, this has similarity to the Biblical account of the flood in [Genesis 6–9](#).

⁶ ㄟ (2007a)動物說話 (dòng wù shuō huà—animals are speaking 1)
 ㄟ (2007b)動物說話 (dòng wù shuō huà—animals are speaking 2)
 ㄟ (2007d)生活說話 (shēng huó shuō huà—life is speaking 1)
 ㄟ (2007e)生活說話 (shēng huó shuō huà—life is speaking 2)
 ㄟ (2007c)有聲世界 (yǒu shēng shì jiè—sounds of the world)
 ㄟ (2007f)車車說話 (chē chē de shuō huà—cars are speaking)

<p>gūa 呱呱 呱呱</p>	<p>the “ribbet ribbet” croaking sound of frogs as in “呱呱”</p>	<p>hā 哈哈 哈哈 to breathe on</p>	<p>the “ha ha” laughing sound as in “哈哈!”, the “achoo” sneezing sound as in 哈啾 (hā jiū)</p>
<p>hāi ⁷ 嗨 嗨 “hi”</p>	<p>the greeting “Hi”</p>	<p>hǒu 吼 吼 to roar</p>	<p>the roaring sound of a lion</p>
<p>hū 呼 呼 to exhale</p>	<p>呼=口+乎 (hū, at)</p>	<p>hūa 嘩 嘩 嘩</p>	<p>sound of a wave; 嘩=口+華 (húa, China)</p>
<p>hùo 噍 噍 噍</p>	<p>the “oink” sound of pigs</p>	<p>jī 唧 唧 唧 pump</p>	<p>the chirping sound of crickets as in “唧唧”</p>
<p>jī 叽 叽 叽 to talk indistinctly</p>	<p>the chirping sound of birds as in “叽叽”</p>	<p>jiū 啾 啾 啾 chirping sound</p>	<p>the chirping sounds of birds or insects</p>
<p>kòu 叩 叩 叩 to knock</p>	<p>the sound of knocking on a door</p>	<p>la 啦 啦 啦</p>	
<p>miāo 喵 喵 喵 “meow”</p>	<p>the sound of cats as in “喵...喵”</p>	<p>miē 咩 咩 咩</p>	<p>the bleating sound (咩) of goats (山羊);</p>
<p>móu 哞 哞 哞</p>	<p>the lowing sound (哞) of cows (牛)</p>	<p>lū 噜 噜 噜 verbose</p>	<p>used with 咕 (gū, to murmur) to describe a hungry stomach ...as in “咕噜 咕噜!”</p>
<p>lūo 囉 囉 囉 to chatter</p>	<p>used at end of sentences as in “...oh!”</p>	<p>ō 喔 喔 喔</p>	<p>an exclamation or crowing sound of roosters;</p>
<p>pā 啪 啪 啪</p>		<p>pēng 砰 砰 砰</p>	<p>sound of a bouncing ball</p>
<p>pīng 乒 乒 乒</p>	<p>sound of a piano</p>	<p>pū 噗 噗 噗</p>	<p>the “putt putt putt” sound of a slow vehicle</p>
<p>sī 嘶 嘶 嘶</p>	<p>the neighing sound of a horse</p>	<p>tà 嗒 嗒 嗒 dejected</p>	

<p>wā sound of crying</p> <p>哇 哇</p>	<p>wēng the buzzing sound of insects as in “嗡嗡”.</p> <p>嗡 嗡</p>
<p>wū “toot” or “hoot” sound of vehicles</p> <p>鳴 鳴</p>	<p>xiū the sound of airplanes as in “咻 咻”</p> <p>咻 咻</p> <p>din</p>
<p>yō can be used together with 唷 as an exclamation as in 哎唷! (āi yó!)</p> <p>唷 唷</p>	<p>zī a squeak; the sound that monkeys make as in “吱吱”</p> <p>吱 吱</p> <p>a squeak</p>

Example 3.8 (Onomatopoeias).

1. gū gū gū gōng jī jiào zhe tiān liàng le 8
 咕 咕 咕！公 雞 叫 著，天 亮 了。
 咕 咕 咕！公 鸡 叫 着，天 亮 了。
 male chicken to call (adverbial) sky bright (change of state)
 rooster

“Cock-a-doodle-doo!”, the rooster crowed, and the sky became bright again.

2. huáng niú de dù zi è de gū lū gū lū jiào 9
 黃 牛 的 肚 子 餓 得 咕 嚕 咕 嚕 叫。
 黄 牛 的 肚 子 饿 得 咕 嚕 咕 嚕 叫。
 yellow cow 's stomach son hungry to the extent of (a sound) (a sound) (a sound) (a sound) to call
 stomach “gurgle” “gurgle”

Yellow Cow's stomach was so hungry that with a “gurgle gurgle” it called out.

3. hā jiū hā jiū bīn bīn hǎo xiàng gǎn mào le 10
 哈 啾！哈 啾！彬 彬 好 像 感 冒 了。
 哈 啾！哈 啾！彬 彬 好 像 感 冒 了。
 to breathe chirps to breathe chirps intelligent intelligent good to resemble to feel to emit
 achoo achoo Bin-Bin to seem to catch a cold

“Achoo! Achoo!” It seems Bin-Bin has caught a cold.

4. kòu kòu kòu zhè shí mén wài xiǎng qǐ qiāo mén de shēng yī-n
 叩！叩！叩！這 時 門 外 響 起 敲 門 的 聲 音
 叩！叩！叩！这 时 门 外 响 起 敲 门 的 声 音
 to knock this time door outside sound to start to knock door (s) sound sound
 to knock at the door sound

7 黃慧敏 (2006): 阿尼要搬家 (ā ní yào bān jiā—Annie wants to move), page 7

8 張晉霖 (2005b): 一塊錢·買一個夢 (yí kuài qián · mǎi yí ge mèng), page 27

9 幼福編輯部 (2005): 大黃牛學勤勞 (dà huáng niú xué qín láo—Big Yellow Cow Learns Diligence), page 22

10 張晉霖 (2005c): 哈啾不見了 (hā jiū bú jiàn le—“Achoo” No More), page 1

11

- “Knock knock knock!” There arose the sound of knocking at the door.
○

5. tā bǎ tóu kào zài zhěn tóu shàng , yí xià zǐ , jiù hū lū hū lū
他 把 頭 靠 在 枕 頭 上 , 一 下 子 , 就 呼 嚕 呼 嚕
he head to lean at pillow head on top of one next son just
pillow a short while a moment

- shuì zháo le 12
睡 著 了
睡 着 了
to sleep a move
to fall asleep

○ He leaned his head against the pillow,
○ and in a brief moment,
with a “ZZZZZ” just fell asleep.

3.4 Radicals

Many Chinese characters contain a sub-component called a *radical*. Identifying this radical can be helpful in recalling the meaning of the character or to locate the character within a Chinese dictionary. Probably the most well known set of radicals is referred to as the *Kangxi radicals*, and are presented in the following table.¹³

kāng	xī	bù	shǒu
康	熙	部	首
康	熙	部	首
health	sunny	part	head
Kangxi		radical	

1 stroke					
1.	一	yī	one		
2.	丨	shù	line		
3.	丶	zhǔ	dot	4.	丿
5.	乙	yǐ	second	6.	乚
					júe hook
2 strokes					
7.	二	èr	two	8.	亠
9.	人	rén	man	10.	儿
11.	入	rù	enter	12.	八
13.	冂	jiǒng	down box	14.	冃
15.	冫	bīng	ice	16.	几
17.	凵	kǎn	open box	18.	刀
19.	力	lì	power	20.	勹
21.	匕	bǐ	spoon	22.	匚
23.	匚	xì	hiding enclosure	24.	十
25.	卜	bǔ	divination	26.	卩
27.	厂	hǎn	cliff	28.	厶
29.	又	yòu	again		sī private
3 strokes					

¹¹ 張晉霖 (2005d): 白雲枕頭 (bái yún zhěn tóu—White Cloud Pillow), page 23

¹² 張晉霖 (2005d): 白雲枕頭 (bái yún zhěn tóu—White Cloud Pillow), page 27

¹³ Allen (2008): *The Unicode Standard 5.1.0* (<http://www.unicode.org/charts/PDF/U2F00.pdf>)

McNaughton and Ying (1999): *Reading & Writing Chinese...*

30.	口	kǒu	mouth	31.	匚	wéi	enclosure
32.	土	tǔ	earth	33.	士	shì	scholar
34.	夕	zhǐ	go	35.	文	sūi	go slowly
36.	夕	xī	evening	37.	大	dà	big
38.	女	nǚ	woman	39.	子	zǐ	child
40.	宀	mián	roof	41.	寸	cùn	inch
42.	小	xiǎo	small	43.	尢	wāng	lame
44.	尸	shī	corpse	45.	屮	chè	sprout
46.	山	shān	mountain	47.	川	chūan	river
48.	工	gōng	work	49.	己	jǐ	oneself
50.	巾	ji/-n	turban	51.	干	gān	dry
52.	幺	yāo	short thread	53.	广	yǎn	dotted cliff
54.	彳	yǐn	long stride	55.	卅	gǒng	two hands
56.	弋	yì	shoot	57.	弓	gōng	bow
58.	厶	jì	snout	59.	彡	shān	bristle
60.	彳	chì	step				
4 strokes							
61.	心	xīn	heart	62.	戈	gē	halberd
63.	戶	hù	door	64.	手	shǒu	hand
65.	支	zhī	branch	66.	攴	pǐ	wrap
67.	文	wén	script	68.	斗	dǒu	dipper
69.	斤	jīn	axe	70.	方	fāng	square
71.	无	wú	not	72.	日	rì	sun
73.	曰	yūe	say	74.	月	yùe	moon
75.	木	mù	tree	76.	欠	qiàn	lack
77.	止	zhǐ	stop	78.	歹	dǎi	death
79.	殳	shū	weapon	80.	毋	wú	do not
81.	比	bǐ	compare	82.	毛	máo	fur
83.	氏	shì	clan	84.	气	qì	steam
85.	水	shuǐ	water	86.	火	huǒ	fire
87.	爪	zhǎo	claw	88.	父	fù	father
89.	爻	yáo	double x	90.	爿	qiāng	half tree trunk
91.	片	piàn	slice	92.	牙	yá	fang
93.	牛	niú	cow	94.	犬	quǎn	dog
5 strokes							
95.	玄	xuán	profound	96.	玉	yù	jade
97.	瓜	guā	melon	98.	瓦	wǎ	tile
99.	甘	gān	sweet	100.	生	shēng	life
101.	用	yòng	use	102.	田	tián	field
103.	疋	pǐ	bolt of cloth	104.	疒	nì	sickness
105.	𠂇	bò	dotted tent	106.	白	bái	white
107.	爪	zhǎo	claw	108.	皿	mǐn	dish
109.	目	mù	eye	110.	矛	máo	spear
111.	矢	shǐ	arrow	112.	石	shí	stone
113.	示	shì	spirit	114.	肉	rǒu	track
115.	禾	hé	grain	116.	穴	xué	cave
117.	立	lì	stand				
6 strokes							
118.	竹	zhú	bamboo	119.	米	mǐ	rice
120.	糸	sī	silk	121.	缶	fǒu	jar
122.	网	wǎng	net	123.	羊	yáng	sheep

124.	羽	yǔ	feather	125.	老	lǎo	old
126.	而	ér	and	127.	耒	lěi	plow
128.	耳	ěr	ear	129.	聿	yù	brush
130.	肉	ròu	meat	131.	臣	chén	minister
132.	自	zì	self	133.	至	zhì	arrive
134.	臼	jiù	mortar	135.	舌	shé	tongue
136.	舛	chuǎn	oppose	137.	舟	zhōu	boat
138.	艮	gèn	stopping	139.	色	sè	color
140.	艸	cǎo	grass	141.	虎	hǔ	tiger
142.	虫	chóng	insect	143.	血	xuè	blood
144.	行	xíng	walk enclosure	145.	衣	yī	clothes
146.	西	xià	west				
7 strokes							
147.	見	jiàn	see	148.	角	jiǎo	horn
149.	言	yán	speech	150.	谷	gǔ	valley
151.	豆	dòu	bean	152.	豕	shǐ	pig
153.	豸	zhì	badger	154.	貝	bèi	shell
155.	赤	chì	red	156.	走	zǒu	run
157.	足	zú	foot	158.	身	shēn	body
159.	車	chē	cart	160.	辛	xīn	bitter
161.	辰	chén	morning	162.	辵	chùo	walk
163.	邑	yì	city	164.	酉	yǒu	wine
165.	采	biàn	distinguish	166.	里	lǐ	village
8 strokes							
167.	金	jīn	gold	168.	長	cháng	long
169.	門	mén	gate	170.	阜	fù	mound
171.	隸	dài	slave	172.	隹	zhūi	short tailed bird
173.	雨	yǔ	rain	174.	青	qīng	blue
175.	非	fēi	wrong				
9 strokes							
176.	面	miàn	face	177.	革	gé	leather
178.	韋	wéi	tanned leather	179.	韭	jiǔ	leek
180.	音	yīn	sound	181.	頁	yè	leaf
182.	風	fēng	wind	183.	飛	fēi	fly
184.	食	shí	eat	185.	首	shǒu	head
186.	香	xiāng	fragrant				
10 strokes							
187.	馬	mǎ	horse	188.	骨	gǔ	bone
189.	高	gāo	tall	190.	髟	biāo	hair
191.	鬥	dòu	fight	192.	鬯	chàng	sacrificial wine
193.	鬲	lì	cauldron	194.	鬼	guǐ	ghost
11 strokes							
195.	魚	yú	fish	196.	鳥	niǎo	bird
197.	鹵	lǔ	salt	198.	鹿	lù	deer
199.	麥	mài	wheat	200.	麻	má	hemp
12 strokes							
201.	黃	huáng	yellow	202.	黍	shǔ	millet
203.	黑	hēi	black	204.	黹	zhǐ	embroidery
13 strokes							
205.	黽	mǐn	frog	206.	鼎	dǐng	tripod
207.	鼓	gǔ	drum	208.	鼠	shǔ	rat

14 strokes						
209.	鼻	bí	<i>nose</i>		210.	齊 qí <i>even</i>
15 strokes						
211.	齒	chǐ	<i>tooth</i>			
16 strokes						
212.	龍	lóng	<i>dragon</i>		213.	龜 gūi <i>tortoise</i>
17 strokes						
214.	龠	yùe	<i>flute</i>			

Appendices

APPENDIX A

NUMBERS

Table A.1: Numbers

English	Chinese (中文)	English	Chinese (中文)
0	líng 零 零	1	yī 一 一
2	èr 二 二	3	sān 三 三
4	sì 四 四	5	wǔ 五 五
6	liù 六 六	7	qī 七 七
8	bā 八 八	9	jiǔ 九 九
10	shí 十 十	11	shí yī 十一 十一 10 1
12	shí èr 十二 十二 10 2	13	shí sān 十三 十三 10 3
14	shí sì 十四 十四 10 4	15	shí wǔ 十五 十五 10 5

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English	Chinese (中文)	English	Chinese (中文)
16	shí liù 十 五 十 五 10 6	17	shí qī 十 六 十 六 10 7
18	shí bā 十 八 十 八 10 8	19	shí jiǔ 十 九 十 九 10 9
20	èr shí 二 十 二 十 2 10	21	èr shí yī 二 十 一 二 十 一 2 10 1
22	èr shí èr 二 十 二 二 十 二 2 10 2	23	èr shí sān 二 十 三 二 十 三 2 10 3
24	èr shí sì 二 十 四 二 十 四 2 10 4	25	èr shí wǔ 二 十 五 二 十 五 2 10 5
30	sān shí 三 十 三 十 3 10	31	sān shí yī 三 十 一 三 十 一 3 10 1
32	sān shí èr 三 十 二 三 十 二 3 10 2	40	sì shí 四 十 四 十 4 10
50	wǔ shí 五 十 五 十 5 10	60	liù shí 六 十 六 十 6 10
70	qī shí 七 十 七 十 7 10	80	bā shí 八 十 八 十 8 10
90	jiǔ shí 九 十 九 十 9 10	93	jiǔ shí sān 九 十 三 九 十 三 9 10 3
100	yī bǎi 一 百 一 百 1 100	200	èr bǎi 二 百 二 百 2 100

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English	Chinese (中文)	English	Chinese (中文)
300	sān bǎi 三 百 三 百 3 100	400	sì bǎi 四 百 四 百 4 100
500	wǔ bǎi 五 百 五 百 5 100	600	liù bǎi 六 百 六 百 6 100
700	qī bǎi 七 百 七 百 7 100	800	bā bǎi 八 百 八 百 8 100
900	jiǔ bǎi 九 百 九 百 9 100		
1,000	yī qiān 一 千 一 千 1 1000	2,000	liǎng qiān 二 千 二 千 2 1000
3,000	sān qiān 三 千 三 千 3 1000	4,000	sì qiān 四 千 四 千 4 1000
10,000	yī wàn 一 萬 一 万 1 10 ⁴	20,000	liǎng wàn 二 萬 二 万 2 10 ⁴
30,000	sān wàn 三 萬 三 万 3 10 ⁴	40,000	sì wàn 四 萬 四 万 4 10 ⁴
100,000	shí wàn 十 萬 十 万 10 10 ⁴	200,000	liǎng shí wàn 二 十 萬 二 十 万 2 10 10 ⁴
300,000	sān shí wàn 三 十 萬 三 十 万 3 10 10 ⁴	400,000	sì shí wàn 四 十 萬 四 十 万 4 10 10 ⁴
1,000,000	yī bǎi wàn 一 百 萬 一 百 万 1 100 10 ⁴	2,000,000	liǎng bǎi wàn 二 百 萬 二 百 万 2 100 10 ⁴

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English	Chinese (中文)	English	Chinese (中文)
3,000,000	sān bǎi wàn 三 百 萬 三 百 万 3 100 10^4	4,000,000	sì bǎi wàn 四 百 萬 四 百 万 4 100 10^4
10,000,000	yī qiān wàn 一 千 萬 一 千 万 1 1000 10^4	100,000,000	yī yì 一 億 一 亿 1 10^8
one billion (10^9)	shí yì 十 億 十 亿 10 10^8	ten billion (10^{10})	yī bǎi yì 一 百 億 一 百 亿 1 100 10^8
one hundred billion (10^{11})	yī qiān yì 一 千 億 一 千 亿 1 1000 10^8	one trillion (10^{12})	yī wàn yì 一 萬 億 一 万 亿 1 10^4 10^8
ten trillion (10^{13})	shí wàn yì 十 萬 億 十 万 亿 10 10^4 10^8	one hundred trillion (10^{13})	yī bǎi wàn yì 一 百 萬 億 一 百 万 亿 1 100 10^4 10^8

APPENDIX B

NAMES

Chinese names typically consist of three characters. The first character is the family name. The next two characters are the given name. To the right is an example using actor “Jackie Chan's” Chinese name:

Chén	gǎng	shēng
陳	港	生
陈	港	生
to lay out	a port	to give birth

B.1 Family Names

A list of some Chinese surnames follows.¹ For pairs of characters, the one on the left is *traditional*, and the one on the right is *simplified*.

Common family names							
白	白	Bái	white	蔡	蔡	Cài	a large turtle
曹	曹	Cáo	(a plural particle)	常	常	Cháng	common; normal
陳	陈	Chén	to arrange	埕	埕	Chéng	
催	催	Cūi	high and steep	戴	戴	Dài	to wear
鄧	邓	Dèng		丁	丁	Dīng	
董	董	Dǒng	to oversee	杜	杜	Dù	to plug
段	段	Duàn	a section	范	范	Fàn	bee
方	方	Fāng	square	馮	冯	Féng	
傅	傅	Fù	a teacher	高	高	Gāo	high; tall
龔	龚	Gōng	reverential	顧	顾	Gù	to turn around and look
郭	郭	Gūo	town	韓	韩	Hán	fence
郝	郝	Hǎo	(an ancient place)	何	何	Hé	
賀	贺	Hè	to congratulate	洪	洪	Hóng	a flood
侯	侯	Hóu	marquis	胡	胡	Hú	to blunder
黃	黄	Huáng	yellow	賈	贾	Jiǎ	(“gǔ”=merchant)
姜	姜	Jiāng	ginger	江	江	Jiāng	river

¹Reference: http://en.wikipedia.org/wiki/List_of_common_Chinese_surnames

蔣	蒋	Jiǎng		金	金	Jīn	gold
康	康	Kāng	health	孔	孔	Kǒng	hole
賴	赖	Lài	to rely on	雷	雷	Léi	thunder
李	李	Lǐ	plums	梁	梁	Liáng	bridge
廖	廖	Liào		林	林	Lín	forest
劉	刘	Liú	to kill	龍	龙	Lóng	dragon
盧	卢	Lú	black	羅	罗	Lúo	thin light silk
陸	陆	Lù	land	呂	吕	Lǚ	
馬	马	Mǎ	horse	毛	毛	Máo	hair
孟	孟	Mèng	eldest child	牛	牛	Niú	ox
潘	潘	Pān	water	彭	彭	Péng	
錢	钱	Qián	money	秦	秦	Qín	Qin Dynasty
邱	邱	Qiū	hill	任	任	Rén	
邵	邵	Shào		沈	沈	Shěn	
史	史	Shǐ	history	施	施	Shī	to carry out
石	石	Shí	rocks	宋	宋	Sòng	
蘇	苏	Sū		孫	孙	Sūn	grandchild; descendent
譚	谭	Tán	to talk	唐	唐	Táng	the Tang Dynasty
田	田	Tián	agricultural land	萬	万	Wàn	ten thousand
汪	汪	Wāng	pool of water	王	王	Wáng	king
韋	韦	Wéi	tanned leather	魏	魏	Wèi	lofty; stately
吳	吴	Wú		武	武	Wǔ	military
夏	夏	Xià	summer	謝	谢	Xiè	to thank
蕭	萧	Xiāo	oxtail southern wood; respectful	熊	熊	Xióng	bear
徐	徐	Xú	slowly; gently; calmly	許	许	Xǔ	
薛	薛	Xūe	(a kind of marsh grass)	姚	姚	Yáo	handsome
嚴	严	Yán	stern; strict	揚	扬	Yáng	to raise
姚	姚	Yáo	handsome	葉	叶	Yè	leaf
尹	尹	Yǐn	to govern	余	余	Yú	I
袁	袁	Yúan	the graceful look of a flowing robe	曾	曾	Zēng	(a 4th generation relationship)
張	张	Zhāng	to spread	趙	赵	Zhào	(an ancient feudal state)
周	周	Zhōu	Zhou Dynasty	鄭	郑	Zhèng	solemn
鍾	钟	Zhōng	bell	鄒	邹	Zōu	
朱	朱	Zhū	bright red				
Not so common family names							
班	班	Bān	a grade	包	包	Bāo	to wrap
鮑	鲍	Bào	abalone	貝	贝	Bèi	shells
畢	毕	Bì	to complete	卜	卜	Bǔ	to divine
成	成	Chéng	completed; accomplished	遲	迟	Chí	late
仇	仇	Chóu	enemy	楚	楚	Chǔ	
狄	狄	Dí		督	督	Dū	to oversee
鐸	铎	Dúo	a large bell	樊	樊	Fán	bird cage
房	房	Fáng	house	斐	斐	Fěi	elegant; beautiful
費	费	Fèi	expedition	馮	冯	Féng	
甘	甘	Gān	delicious	戈	戈	Gē	spear; lance

葛	葛	Gě		辜	辜	Gū	sin; crime
古	古	Gǔ	ancient	官	官	Gūan	government official
管	管	Gǔan	tube; pipe	桂	桂	Gùi	
花	花	Huā	flower	季	季	Jì	season
簡	簡	Jiǎn	brief	焦	焦	Jiāo	scorched
景	景	Jǐng	scenery	柯	柯	Kē	tall evergreen tree
寇	寇	Kòu	bandits	匡	匡	Kuāng	to correct
黎	黎	Lí	numerous	栗	栗	Lì	chestnut tree
連	连	Lián	to connect	柳	柳	Liǔ	willow tree
魯	鲁	Lǔ	dull	陸	陆	Lù	land
路	路	Lù	road	麥	麦	Mài	wheat; barley; oats
眉	眉	Méi	eyebrows	梅	梅	Méi	prunes
門	门	Mén	door	苗	苗	Miáo	a sprout
莫	莫	Mò	not	穆	穆	Mù	peaceful; serene
納	纳	Nà	to receive	南	南	Nán	south
年	年	Nián	year	聶	聂	Niè	
裴	裴	Péi	the look of a flowing gown	皮	皮	Pí	skin; fur
溥	溥	Pǔ	great; wide; vast	齊	齐	Qí	equal
泉	泉	Quán	spring; fountain	阮	阮	Rǔan	(ancient musical instrument)
單	单	Shàn		水	水	Shǔi	water
肅	肃	Sù	respectful; majestic	臺	台	Tái	a lookout; an observatory
太	太	Tài	very big	湯	汤	Tāng	hot water; soup
陶	陶	Táo	pottery	童	童	Tóng	child
宛	宛	Wǎn	crooked	尾	尾	Wěi	tail
魏	魏	Wèi	lofty; stately; magnificent	溫	温	Wēn	warm
聞	闻	Wén	to hear	翁	翁	Wēng	father
巫	巫	Wū	witch; wizard	烏	乌	Wū	crow; raven
向	向	Xiàng	to face	須	须	Xū	must
宣	宣	Xūan	to announce	玄	玄	Xúan	far and obscure
晏	晏	Yàn	clear	楊	杨	Yáng	poplar
伊	伊	Yī	he; she	宜	宜	Yí	right; fitting
易	易	Yì	to exchange	英	英	Yīng	a flower
尤	尤	Yóu	to feel bitter	猶	犹	Yóu	similar to
玉	玉	Yù	precious stone	郁	郁	Yù	colorfully ornamented
喻	喻	Yù	parable; to explain	越	越	Yüe	to go beyond
樂	乐	Yüe	music	宰	宰	Zǎi	to preside
曾	曾	Zēng	3 generation difference	詹	詹	Zhān	verbosity
湛	湛	Zhàn	deep; profound	戰	战	Zhàn	war
章	章	Zhāng	a piece of writing	芝	芝	Zhī	
智	智	Zhì	capable; wisdom	摯	挚	Zhì	sincere
莊	庄	Zhūang	solemn	宗	宗	Zōng	ancestor
祖	祖	Zǔ	grandfather; grandmother				
Rare family names							
邸	邸	Dǐ	residence of a high official	頽	颓	Túi	to crumble
洗	洗	Xiǎn		荀	荀	Xún	

義	义	Yì	justice	於	于	Yú	in
禹	禹	Yǔ		查	查	Zhā	
湖	湖	Hú	lake	據	据	Jù	proof
可	可	Kě	to be able to	臨	临	Lín	to look down from above
茅	茅	Máo	couch grass	猛	猛	Měng	bold; fierce

B.2 Characters for male names

Common characters for male names

澳	澳	ào	deep waters	奧	奥	ào	mysterious; profound
保	保	bǎo	to guard	備	备	bèi	completeness
炳	炳	bǐng	bright; luminous	伯	伯	bó	a count (nobility)
博	博	bó	extensive; abundant	財	财	cái	wealth
燦	灿	càn	bright and brilliant	闡	阐	chǎn	to make clear
昌	昌	chāng	proper; good	暢	畅	chàng	smoothly; fluently
超	超	chāo	to exceed	晨	晨	chén	morning; daybreak
誠	诚	chéng	sincere; honest	矗	矗	chù	steep; lofty
川	川	chūan	river	達	达	dá	intelligent; understanding
道	道	dào	road; path	德	德	dé	virtue
登	登	dēng	to ascend; to climb	燈	灯	dēng	lamp; lantern
迪	迪	dí	to progress	頂	顶	dǐng	the top
鬥	斗	dòu	to struggle	渡	渡	dù	to cross
敦	敦	dūn	honest; to deepen	奮	奋	fèn	to rise in force
豐	丰	fēng	abundant	奉	奉	fèng	to receive with respect
福	福	fú	good fortune; a blessing	扶	扶	fú	to support
富	富	fù	wealthy	功	功	gōng	merit; achievement
谷	谷	gǔ	valley	固	固	gù	stable; sturdy
圭	圭	guī	(a jade tablet)	傀	傀	guī	great; wonderful
貴	贵	guì	high-placed	過	过	guò	to pass
捍	捍	hàn	to defend	皓	皓	hào	white and bright
篆	篆	háo	outstandingly intelligent	和	和	hé	harmony
宏	宏	hóng	magnificent	泓	泓	hóng	deep
鴻	鸿	hóng	swan	煥	焕	huàn	shining
虎	虎	hǔ	brave	暉	晖	hūi	radiant
火	火	huǒ	fire	繼	继	jì	to carry on
堅	坚	jiān	strong and durable	佼	佼	jiǎo	charming
結	结	jiē	tough	杰	杰	jié	outstanding
捷	捷	jié	swift	傑	杰	jié	remarkable
介	介	jiè	upright	勁	劲	jìn	vigor
進	进	jìn	to advance	晉	晋	jìn	to advance
井	井	jiǐng	a well	靖	靖	jìng	peaceful
炯	炯	jiǒng	brightness	凱	凯	kǎi	peace
康	康	kāng	healthy	慷	慷	kāng	unselfish

克	克	kè	to overcome	客	客	kè	guest
昆	昆	kūn	elder brother	琅	琅	láng	clean and white
瑯	瑯	láng	pure and white	禮	礼	lǐ	courtesy
理	理	lǐ	reason; logic	力	力	lì	strength
良	良	liáng	fine; desirable	烈	烈	liè	fiery
嶙	嶙	lín	rugged	亮	亮	liàng	bright
諒	諒	liàng	honest	霖	霖	lín	continuous heavy rain
磷	磷	lín	water flowing between stones	令	令	lìng	excellent
流	流	liú	to flow; mobile	隆	隆	lóng	prosperous; abundant
民	民	mín	the people	牧	牧	mù	to shephard
睦	睦	mù	friendly; to befriend	邁	迈	mài	to surpass
滿	满	mǎn	full; plentiful	茫	茫	máng	vast; boundless
茂	茂	mào	exuberant	萌	萌	méng	to bud; to shoot forth
渺	渺	miǎo	endlessly vast	淼	淼	miǎo	extensive; vast
明	明	míng	bright; brilliant	慕	慕	mù	to long for; to adore
耐	耐	nài	to endure	沛	沛	pèi	abundance
忤	忤	pēng	eager	祈	祈	qí	to pray
杞	杞	qǐ	a species of willow	謙	谦	qiān	humble
勤	勤	qín	diligent; industrious	清	清	qīng	pure; virtuous
遒	遒	qiú	strong; vigorous	饒	饶	ráo	abundant
仁	仁	rén	benevolence; kindness	榮	荣	róng	glory; honor
融	融	róng	glowing	睿	睿	rùi	wise and clever
塞	塞	sài	to compete	森	森	sēn	luxuriant vegetation
山	山	shān	mountain	善	善	shàn	good; virtuous
贍	贍	shàn	to provide	盛	盛	shèng	abundant; rich
慎	慎	shèn	cautious; prudent	士	士	shì	scholar
守	守	shǒu	to protect	舒	舒	Shū	to unfold
碩	硕	shuò	great; large	嵩	嵩	sōng	mountain song
添	添	tiān	to increase	遂	遂	sùi	to satisfy; to fulfill
潭	潭	tán	deep water; profound	旺	旺	wàng	prosperous
威	威	wēi	dignity; authority; awe	惟	惟	wéi	to think; to meditate
維	维	wéi	to hold fast	穩	稳	wěn	stable; steady
梧	梧	wú	a support	悟	悟	wù	to become aware of; to realize
晤	晤	wù	to meet; enlightened; wise	悉	悉	xī	to know
皙	皙	xī	fair, white	溪	溪	xī	mountain stream
俠	俠	xiá	chivalry	峽	峡	xiá	a gorge
黠	黠	xiá	smart; clever	閒	閒	xián	quiet; calm
賢	贤	xián	capable; versatile	現	现	xiàn	to emerge
祥	祥	xiáng	auspicious	協	协	xié	to agree; to help
新	新	xīn	new; fresh	興	兴	xīng	to rise; to thrive
興	兴	xīng	cheerful; happy	旭	旭	xù	radiance of daybreak
勳	勳	xūn	merits; honors	涯	涯	yá	water's edge
巖	巖	yán	a rock	嚴	严	yán	beautiful
儼	儼	yǎn	majestic; respectable	決	决	yǎng	great; profound
杳	杳	yǎo	deep and expansive	屹	屹	yì	to rise high



奕	奕	yì	great; grand; abundant	益	益	yì	to increase
軼	軼	yì	to excel	肄	肄	yì	to study; to toil
毅	毅	yì	firm; endurance; fortitude	藝	藝	yì	art; skill
翼	翼	yì	wings; to help	殷	殷	yīn	flourishing
蔭	蔭	yìn	shade	廕	廕	yìn	to shelter
熒	熒	yíng	candle light	贏	贏	yíng	to win
雍	雍	yōng	harmony; peaceful	勇	勇	yǒng	courageous; fearless
優	優	yōu	excellent; abundant	域	域	yù	frontier
裕	裕	yù	abundance; generous	譽	譽	yù	fame; honor
豫	豫	yù	comfort; to travel	援	援	yúan	to lead; to rescue
嶽	嶽	yùe	a high mountain	贊	贊	zàn	to assist; to support
增	增	zēng	to increase	嶄	嶄	zhǎn	towering
璋	璋	zhāng	an ancient jade ornament	朝	朝	zhāo	morning
哲	哲	zhé	a thinker; wise	崢	崢	zhēng	lofty; outstanding
拯	拯	zhěng	to save; to deliver	正	正	zhèng	proper
陟	陟	zhì	to ascend	忠	忠	zhōng	faithful; devoted
助	助	zhù	to help				

Not commonly used characters for male names

瀑	瀑	bào	sudden pouring rain	懂	懂	dǒng	to understand
敢	敢	gǎn	to dare; bold	趕	趕	gǎn	to pursue
好	好	hǎo	good	駕	駕	jià	to excel
肩	肩	jiān	to sustain	澗	澗	jiàn	mountain stream
匠	匠	jiàng	craftsman	禁	禁	jīn	to endure
勁	勁	jìng	powerful	剋	剋	kè	to overcome
懇	懇	kěn	sincere	款	款	kǔan	sincerity
闊	闊	kùo	wealthy	擴	擴	kùo	to expand
倆	倆	liǎng	craft; ability	瀏	瀏	liú	the appearance of a clear stream

B.3 Characters for female names

Common characters for female names

愛	爱	ài	to love	芭	芭	bā	a fragrant plant
蓓	蓓	bèi	flower bud	嬋	嬋	chán	graceful; ladylike
春	春	chūn	spring	淳	淳	chún	pure; clean; simple
慈	慈	cí	kind; loving	黛	黛	dài	a beauty
旦	旦	dàn	daybreak	朵	朵	dúo	flower
婀	婀	ē	graceful; elegant	娥	娥	é	good; beautiful
芳	芳	fāng	fragrant; virtuous	菲	菲	fēi	fragrant
芬	芬	fēn	fragrance; perfume	鳳	凤	fèng	male phoenix
馥	馥	fù	fragrant fragrance	瑰	瑰	guī	fabulous; a kind of jasper
蕙	蕙	huì	fragrant orchid	薈	荟	huì	luxuriant growth
慧	慧	huì	wise	姬	姬	jī	beautiful lady
佳	佳	jiā	beautiful	嬌	娇	jiāo	delicate
潔	洁	jié	pure	菁	菁	jīng	the flower of the leek

靜	静	jiǐng	tranquility	淨	净	jiǐng	pure
娟	娟	jūan	graceful	嵐	岚	lán	mountain vapor
蘭	兰	lán	orchid	莉	莉	lì	white jasmine
麗	丽	lì	beautiful	蓮	莲	lián	lotus
戀	恋	liàn	to be in love	玲	玲	líng	tinklings of jade
綾	绫	líng	very fine silk cloth	曼	曼	màn	delicately beautiful; graceful
玫	玫	méi	rose	美	美	měi	beautiful
蜜	蜜	mì	honey	妙	妙	miào	wonderful; intriguing; ingenious
念	念	niàn	to miss; to long for	嫵	妩	niǎo	delicate; graceful
寧	宁	níng	peace; serenity	綺	绮	qǐ	beautiful; resplendent
情	情	qíng	feelings; love	晴	晴	qíng	fine; fair
瓊	琼	qióng	fine jade	柔	柔	róu	soft and tender
珊	珊	shān	tinkling of jade	韶	韶	sháo	a form of music; beautiful, harmonious
絲	丝	sī	silk	素	素	sù	pure white silk
曇	昙	tán	clouds	甜	甜	tián	sweet; agreeable
恬	恬	tián	quiet; undisturbed	窈	窈	tiǎo	slender; charming
婉	婉	wǎn	amiable; pleasant	舞	舞	wǔ	to dance
絃	弦	xián	the string of a musical instrument	嫻	娴	xián	refined; gracious
香	香	xiāng	sweet-smelling	心	心	xiān	heart
欣	欣	xiān	glad	欣	欣	xiān	glad; joyful
曉	晓	xiǎo	daybreak; dawn	秀	秀	xiù	brilliant; beautiful; graceful
絢	绚	xuàn	bright and brilliant	雪	雪	xuě	snow
雅	雅	yǎ	refined; polished	嫵	妩	yān	captivating; fascinating
雁	雁	yàn	wild goose	瑤	瑶	yáo	precious jade
樂	乐	yào	to love	怡	怡	yí	harmony; jubilation
旖	旖	yǐ	romantic; tender	音	音	yīn	sound; musical note
瑛	瑛	yīng	glitter of jade	櫻	樱	yīng	cherry; cherry blossoms
詠	咏	yǒng	to sing; to hum	瑜	瑜	yú	perfect gem
愉	愉	yú	happy; joyful	月	月	yuè	the moon
韻	韵	yùn	rhymes	貞	贞	zhēn	chastity; pure
珍	珍	zhēn	precious; rare	珠	珠	zhū	pearl
Not often used characters for female names							
緋	绯	fēi	scarlet; crimson	邵	邵	shào	to encourage; graceful
簫	箫	yùe	a kind of flute				

B.4 Characters for either male or female names

Characters for either male or female names							
藹	蔼	ǎi	exuberant; amiable	安	安	ān	peaceful
本	本	běn	root; source	才	才	cái	gifted person
恩	恩	ēn	grace; kindness	梵	梵	fàn	clean and pure
飛	飞	fēi	to fly	霏	霏	fēi	falling of snow and rain
翡	翡	fěi	kingfisher; emerald	丰	丰	fēng	good-looking
風	风	fēng	wind; breeze	佳	佳	jiā	excellent

錦	锦	jǐn	glorious	樂	乐	lè	happy
夢	梦	mèng	dream	瑞	瑞	rùi	lucky
詩	诗	shī	poetry	思	思	sī	to think
琬	琬	wǎn	(a kind of jade tablet)	望	望	wàng	to watch; to hope
文	文	wén	a composition; culture	蓊	蓊	wěng	flourishing; lush
喜	喜	xǐ	a joyful thing	禧	禧	xǐ	happiness; blessings
夏	夏	xià	summer	相	相	xiàng	to examine; to help
行	行	xíng	to walk	幸	幸	xìng	well-being
續	续	xù	to continue; to renew	誼	谊	yì	friendship
穎	颖	yǐng	outstanding; remarkable	愉	愉	yú	happy; contented
雨	雨	yǔ	rain	照	照	zhào	to shine upon
甄	甄	zhēn	potter's wheel	佐	佐	zǔo	to assist
妍	妍	yán	beautiful	耀	耀	yào	to shine; to dazzle
盈	盈	yíng	to fill	羽	羽	yǔ	feather; wing
知	知	zhī	knowledge				

B.5 Famous names

It might be useful to see some examples of names of real people (past and present). ²

Table B.5: Famous people

name	description
Féng Gúo zhāng 馮 國 璋 冯 国 璋 country jade tablet	male, 1858–1919, army general and politician
Lí Yúan hóng 黎 元 洪 黎 元 洪 many first flood	male, 1864–1928, general and former president of Taiwan
Dùan qí rùi 段 祺 瑞 段 祺 瑞 lucky auspicious	male, 1864–1936, army commander and provisional chief executive
Wèi dào míng 魏 道 明 魏 道 明 magnificent road bright	male, 1900–1978, governor of Taiwan province from 1947–1949
Yúan shì kǎi 袁 世 凱 袁 世 凱 generation triumphant strains	male, 1859–1916, military official and politician

continued on the next page ...

²Reference: http://en.wikipedia.org/wiki/List_of_Chinese_people

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name	description
<p>Yáng gù fēi 楊 貴 妃 杨 贵 妃</p> <p>poplar valued concubine</p>	female, 719–756, highest ranking imperial concubine
<p>Wáng zhāo jūn 王 昭 君 王 昭 君</p> <p>king clear monarch</p>	female, ~40B.C., One of the “Four Beauties” of ancient China
<p>Jiǎng tíng xī 蔣 廷 錫 蒋 廷 锡</p> <p>monarch's court tin</p>	male, 1669–1732 painter and encyclopedia editor
<p>liáng lǎng qiū 梁 朗 秋 梁 朗 秋</p> <p>roof beam bright autumn</p>	male, ~ 1900; poet and calligrapher
<p>Qí bái shí 齊 白 石 齐 白 石</p> <p>orderly white stone</p>	male, 1864–1957; painter
<p>Wáng xī zhī 王 羲 之 王 羲 之</p> <p>king (a legendary ruler) to arrive at</p>	male, 303–361; the “Sage of Calligraphy”
<p>Zhào mèng fǔ 趙 孟 頌 赵 孟 頌</p> <p>first month of a season to bow the head</p>	male, 1254–1322; prince, scholar, painter, and calligrapher
<p>Zhèng xiào xū 鄭 孝 胥 郑 孝 胥</p> <p>solemn dutiful together</p>	male, 1860–1938; statesman, diplomat, and calligrapher
<p>Chéng màn qīng 鄭 曼 青 郑 曼 青</p> <p>graceful blue</p>	male, 1902–1975; the “Master of Five Excellences”: Chinese medicine, Tai Chi Chuan, calligraphy, painting, and poetry
<p>Xiè tíng fēng 謝 霆 鋒 谢 霆 霆 鋒</p> <p>to thank sudden thunder cutting edge of a sword</p>	male, 1980– ; singer and actor
<p>Fàn bīng bīng 范 冰 冰 范 冰 冰</p> <p>ice ice</p>	female, 1981– ; actress

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name	description
<p>Bó ān ní 柏 安 妮 柏 安 妮 cypress peaceful maid</p>	female; actress, English name “Ann Bridgewater”
<p>Lǐ Xiǎo lóng 李 小 龍 李 小 龍 plum tree little dragon</p>	male, 1940–1973, martial arts actor, English name, “Bruce Lee”
<p>Chén gǎng shēng 陳 港 生 陈 港 生 to lay out a port to give birth</p>	male, 1954– ; martial arts actor, English name “Jackie Chan”
<p>Zhōu xīng chí 周 星 馳 周 星 馳 star to gallop</p>	male, 1962; actor, director, English name “Stephen Chow”
<p>Wú yǔ sēn 吳 宇 森 吴 宇 森 roof luxuriant vegetation</p>	male, 1946– ; director, producer, English name “John Woo”
<p>Chén huì shān 陳 慧 珊 陈 慧 珊 to lay out wisdom tinkling of jade</p>	female, 1970– ; actress, English name “Flora Chan”
<p>Chén huì lín 陳 慧 琳 陈 慧 琳 to layout wisdom beautiful jade</p>	female, 1972– ; singer and actress, English name, “Kelly Chen”
<p>Dèng lì jūn 鄧 麗 君 邓 丽 君 beautiful monarch</p>	female, 1953–1995; singer, English name “Teresa Teng”
<p>Chén jǐng rùn 陳 景 潤 陈 景 潤 a view moist</p>	male, 1933–1996; mathematician

B.6 Non-Chinese names


Chinese names are often carefully chosen for their meanings. However when translating non-Chinese names into Chinese, characters are chosen that “sound like” the name of the person in that person's mother tongue. Here are some examples of famous non-Chinese people:

name	description
<p> Wéi dé Lái tè ³ 韋 得 萊 特 韦 得 莱 特 soft leather to get wild weeds special Wilbur Wright </p>	<p>Wilbur Wright, one of the inventors of the modern airplane</p>
<p> Aò wēi ěr Lái tè ⁴ 奥 威 尔 莱 特 奥 威 尔 莱 特 abstruse might you wild weeds special Wright </p>	<p>Orville Wright, one of the inventors of the modern airplane</p>

References:

-  葉德明, editor: *Far East Pinyin Chinese-English Dictionary*: 遠東拼音漢英辭典. Taipei: 遠東圖書公司 (yǎn dōng tú shū gōng sī) The Far East Book Company, Limited, 2000 (URL: <http://www.worldcat.org/isbn/957612462X>), ISBN 978-9576124624
-  *Dr. Eye for Windows 95/98/NT/2000/ME/XP*. Inventec Group (URL: <http://www.dreya.com>)

³  (2004) 萊特兄弟 *Wright Brothers*, page 1

⁴  (2004) 萊特兄弟 *Wright Brothers*, page 1

--

APPENDIX C

SONGS

C.1 Old McDonald

wàng lǎo xiān shēng yǒu kuài dì
 王 老 先 生 有 塊 地
 王 老 先 生 有 块 地
 king old ahead birth have chunk earth
 mister

Table C.1: Old McDonald

English	Chinese (中文)
Old McDonald had a farm.	<p>wàng lǎo xiān shēng yǒu kuài dì 王 老 先 生 有 塊 地 王 老 先 生 有 块 地 king old ahead birth have chunk earth mister</p>
Yi ai yi ai oh	<p>yī yā yī yā yōu 咿 呀 咿 呀 哟 ! 咿 呀 咿 呀 哟 ! (sound) (sound) (sound) (sound) (sound)</p>
And on that farm he had a duck.	<p>tā zài yuán lǐ yǎng xiǎo yā 他 在 園 裡 養 小 鴨 他 在 园 里 养 小 鸭 he at garden inside raise small duck duckling</p>
Yi ai yi ai oh	<p>yī yā yī yā yōu 咿 呀 咿 呀 哟 ! 咿 呀 咿 呀 哟 !</p>
Duckling here gua gua	<p>xiǎo yā zhè lǐ gū gū 小 鴨 這 裡 呱 呱 小 鴨 这 里 呱 呱 small duck this inside baby's cry duckling here</p>
Duckling there gua gua	<p>xiǎo yā nà lǐ gū gū 小 鴨 那 裡 呱 呱 小 鴨 那 里 呱 呱 small duck there inside baby's cry duckling there</p>
everywhere gua gua	<p>dào chù dōu zài gū gū 到 處 都 在 呱 呱 到 处 都 在 呱 呱 reach place all at baby's cry everywhere</p>

continued on the next page ...

...continued from the previous page

English	Chinese (中文)
Old McDonald had a farm.	<p>wàng lǎo xiān shēng yǒu kuài dì 王 老 先 生 有 塊 地 王 老 先 生 有 块 地 king old ahead birth have chunk earth mister</p>
Yī ai yī ai oh	<p>yī yā yī yā yōu 伊 呀 伊 呀 呦 ! 伊 呀 伊 呀 呦 !</p>

C.2 Bright Moon

Table C.2: Bright Moon

English	Chinese (中文)
"When did we first have the bright moon?",	<p> miǐng yuè jǐ shí yǒu ? 明 月 幾 時 有 ? 明 月 几 时 有 ? bright moon how many time have when </p>
holding a wine glass, I asked the blue sky.	<p> bǎ jiǔ wèn qīng tiān 。 把 酒 問 青 天 。 把 酒 问 青 天 。 grip alcohol ask blue sky hold a wine glass blue sky </p>
I wonder, in Heaven's imperial palace,	<p> bù zhī tiān shàng gōng qūe , 不 知 天 上 宮 闕 , 不 知 天 上 宫 阙 , not know sky above palace palace wonder if heaven imperial palace </p>
what year it is today.	<p> jīn xī shì hé nián 。 今 夕 是 何 年 。 今 夕 是 何 年 。 present sunset is what year today what year </p>
I desire to ride the wind to go back,	<p> wǒ yù chéng fēng guī qù , 我 欲 乘 風 歸 去 , 我 欲 乘 风 归 去 , I desire ride wind to go back to go go back to </p>
but dread the magnificent jade palace,	<p> yòu kǒng qióng lóu yù yǔ , 又 恐 瓊 樓 玉 宇 , 又 恐 琼 楼 玉 宇 , but dread jade building jade roof splendid hall magnificent jade palace </p>
that such a high place is too cold.	<p> gāo chù bù shēng hán 。 高 處 不 勝 寒 。 高 处 不 胜 寒 。 high place not competent cold too </p>

continued on the next page ...

...continued from the previous page

English	Chinese (中文)
Rise and dance until making a pure shadow,	<p>qǐ wǔ nòng qīng yǐng , 起 舞 弄 清 影 , 起 舞 弄 清 影 , rise dance make pure shadow rise and dance pure shadow</p>
in what seems like the world of man!	<p>hé sì zài rén jiān ! 何 似 在 人 间 ! 何 似 在 人 间 ! what similar at man between similar to world of man</p>
Arching over the bright red pavillion,	<p>zhǔan zhū gé , 轉 朱 閣 , 转 朱 阁 , revolve bright red pavillion</p>
the moonlight hangs down on the beautiful door,	<p>dī qǐ hù , 低 綺 戶 , 低 绮 户 , hang down beautiful door</p>
shining on the sleepless.	<p>zhào wú mián 。 照 無 眠 。 照 无 眠 。 illuminate without sleep</p>
The moon should not have hate,	<p>bù yīng yǒu hèn , 不 應 有 恨 , 不 应 有 恨 , not should have hate deserved</p>
so why when it is time to leave, is the moon so full and round?	<p>hé shì cháng xiàng bié shí yuán ? 何 事 長 向 別 時 圓 ? 何 事 长 向 别 时 圆 ? what affairs long hitherto leave time round why always time to leave</p>
People have sorrow, joy, separation, togetherness;	<p>rén yǒu bēi huan lí hé , 人 有 悲 歡 離 合 , 人 有 悲 欢 离 合 , people have sadness cheerful apart together</p>
the moon has times of being overcast, clear, full and round, diminished,	<p>yuè yǒu yīn qīng yuán quē , 月 有 陰 晴 圓 缺 , 月 有 阴 晴 圆 缺 , moon have overcast clear round deficient</p>
since ancient times, these things have been difficult to reconcile.	<p>cǐ shì gǔ nán quán 。 此 事 古 難 全 。 此 事 古 难 全 。 these affairs ancient difficult completely</p>

continued on the next page ...



...continued from the previous page

English	Chinese (中文)
If only people can remain together for a long time,	dàn yuàn rén cháng jiǔ 但 願 人 長 久 , 但 愿 人 长 久 , but hope people long time if only long time
or travel a thousand miles to share life with a lovely lady.	qiān lǐ gòng chán jiān 千 里 共 嬋 娟 ° 千 里 共 婵 娟 ° thousand li share graceful beautiful long distance lovely

midi file available at: <http://www.hamienet.com/midi15005.html>

C.3 Amazing Grace

Table C.3: Amazing Grace

English	Chinese (中文)											
Amazing grace, how sweet the sound	qí 奇 奇	yì 異 異	eē 恩 恩	diǎn 典 典	hé 何 何	děng 等 等	gān 甘 甘	tián 甜 甜				
	unusual	different	favor	law	how	same as	sweet	sweet				
	unusual		grace		how		sweet					
that saved a wretch like me!	wǒ 我 我	zuì 罪 罪	yǐ 已 已	dé 得 得	shè 赦 赦	miǎn 免 免						
	I	guilt	already	obtain	pardon	to exempt						
				to pardon								
I once was lost, but now am found,	qián 前 前	wǒ 我 我	shī 失 失	sàng 喪 喪	jīn 今 今	bèi 被 被	xún 尋 尋	huí 回 回				
	before	I	to lose	to lose	now	have been	to search	to go back to				
			lost				found					
Was blind, but now I see.	xiā 瞎 瞎	yǎn 眼 眼	jīn 今 今	dé 得 得	kàn 看 看	jiàn 見 見						
	blind	eye	now	to obtain	to look at	to see						
				to see								
'Twas grace that taught my heart to fear,	rú 如 如	cǐ 此 此	eē 恩 恩	diǎn 典 典	shǐ 使 使	wǒ 我 我	jìng 敬 敬	wèi 畏 畏				
	as this	favor	law	to make	I	to reverence	to fear					
	'twas	grace	to hold in awe									
And grace my fears relieved;	shǐ 使 使	wǒ 我 我	xīn 心 心	dé 得 得	ān 安 安	wèi 慰 慰						
	to make	my	heart	to obtain	peace	to console						
				comfort								
How precious did that grace appear, The hour I first believed!	chū 初 初	xìn 信 信	zhī 之 之	shí 時 時	jì 既 既	méng 蒙 蒙	eē 恩 恩	huì 惠 惠	zhēn 真 真	shì 是 是	hé 何 何	děng 等 等
	first	to believe	of	time	as	to receive	grace	favor	true	that	how	same as
							mercy;grace				how	
	bǎo 寶 寶	guì 貴 貴										
	treasure	expensive										
	precious											

English lyrics available at http://en.wikipedia.org/wiki/Amazing_grace

APPENDIX D

FONT INFORMATION

D.1 Typesetting engine

This text was typeset using Xe_ΛTeX, which is part of the T_EXfamily of typesetting engines, which is arguably the greatest development since the Gutenberg Press. Graphics were rendered using the *pstricks* and related packages, and Λ_TE_X graphics support.

```
1 \usepackage{etex} % deal with counter problem
2 \usepackage{xifthen} % if then else support, includes \cnttest
3 \usepackage{calc} % calculation
4 \usepackage{array} % new tabular and array support, \newcolumntype
5 \usepackage{longtable} % tabular with page breaks
6 \usepackage{xcolor} % color support
7 \usepackage{graphicx} %
8 \usepackage{fancyhdr} % headers
9 \usepackage[Glenn]{fncychap} % fancy chapter headings: Sonny, Lenny, Glenn, Conny, Rejne, Bjarne
10 \usepackage{url} % url support: \url{} \path{}
11 \usepackage{index} % multiple index support
12 \usepackage{fancybox} % shadow, oval, and double boxes
13 \usepackage[multiple]{footmisc} % footnote support
14 \usepackage{fancyvrb} % fancy verbatim -- supports verbatim in footnotes plus more
15 \usepackage{nextpage} % \cleartooddpage, \cleartoevenpage
16 \usepackage{multicol} % multiple column support
17 \usepackage{colortbl} % color in tables
18 %\usepackage{xetex-pstricks} % pstricks help for XeLaTeX and XeTeX
19 \usepackage{pst-node} % psmatrix
20 \usepackage[tiling]{pst-fill} % pst fill package
21 \usepackage{pst-plot} % ps plots
22 \usepackage{multido} % loop support for ps diagrams
23 \usepackage{nccrules} % dashed patterns
24 \usepackage{pstricks} % graphics support
25 \usepackage{pstricks-add} % fixe and addons for pstricks
26 \usepackage{pst-grad} % gradients
27 \usepackage{geometry} %
28 \usepackage{hyperref} % hyperlinks in text
29 \usepackage{prettyref} % references with prefixes
30 \usepackage{listings} % source code listing support
```

D.2 Latin fonts

The main font for this document is *Heros*—a *sans-serif* font similar to Helvetica. *Heros* is from the *T_EX-Gyre Project* and included in the T_EXLive distribution.

```

1 \setmainfont[
2   Extension      = { .otf },
3   UprightFont    = { *-regular },
4   BoldFont       = { *-bold },
5   ItalicFont     = { *-italic },
6   BoldItalicFont = { *-bolditalic },
7   Ligatures      = { NoCommon },
8 ]{texgyreheros} % sans-serif font

```

The font used in quotation boxes on page [vii](#) is adapted from *Zapf Chancery Medium Italic*, originally from URW++ Design and Development Incorporated. The font used for the text in the title is Adventor (similar to *Avant-Garde*) from the *T_EX-Gyre Project*. The font used for the version identifier in the footer of individual pages is LIQUID CRYSTAL (*Liquid Crystal*) from *FontLab Studio*.

D.3 IPA typesetting

The IPA information is typeset using the *GnuFree Sans-Serif font family*:

<http://www.gnu.org/s/freefont/>

The glyphs were entered using a *TECkit mapping* in an X_YL_AT_EX environment with font feature specification as follows:

```
\newcommand{\fntipa}{\fntFreeSans\addfontfeatures{Mapping=/dan/r/common/TECkit/ascii-uipa}}
```

...where *ascii-uipa* is a *TECkit mapping* compiled from a *TECkit ascii-uipa.map* file which is about 350 lines long and looks in part something like this:

```

1 latin_capital_letter_S      <> latin_small_letter_esh      ;tipa| U+0053 <> U+0283
2 latin_capital_letter_Z      <> latin_small_letter_ezh      ;tipa| U+005A <> U+0292
3 BSL COL latin_small_letter_s <> latin_small_letter_s_with_hook ;tipa| \:s   <> U+0282
4 FSL COL latin_small_letter_s > latin_small_letter_s_with_hook ;   | /:s   <> U+0282

```

As a result, “{\fntipa San}” typesets to “Jan”.

D.4 PinYin typesetting

The PinYin information is typeset using the documents main Latin font (see Section [D.2](#)) but with assistance from a *TECkit mapping* in an X_YL_AT_EX environment with font feature specification as follows:

```

1 \defaultfontfeatures{%
2   Ligatures      = { NoCommon },% e.g. "fi" be represented as a single character?
3   Mapping        = /dan/r/common/TECkit/punctuation ,
4   SmallCapsFeatures = { Letters=SmallCaps },
5 }

```

...where punctuation is a TECKit mapping compiled from a TECKit punctuation.map file which is about 230 lines long and contains statements like these:

```
1 FSL grave_accent    latin_small_letter_a <> latin_small_letter_a_with_grave    ;/`a <> U+00E0
2 FSL apostrophe     latin_small_letter_a <> latin_small_letter_a_with_acute    ;/'a <> U+00E1
3 FSL colon          latin_small_letter_a <> latin_small_letter_a_with_diaeresis ;/:a <> U+00E4
4 FSL less_than_sign latin_small_letter_a <> latin_small_letter_a_with_circumflex ;/<a <> U+00E2
5 FSL HYP            latin_small_letter_a <> latin_small_letter_a_with_macron    ;/-a <> U+0101
```

As a result, “sh/-an” typesets to “shān”.

D.5 Traditional Chinese typesetting

Traditional Chinese glyphs appearing in the text are from Google's *Noto Sans CJK* font family: <https://www.google.com/get/noto/help/cjk/>. The Noto project has both *sans-serif* (illustrated to the left) and *serif* (illustrated to the right) fonts available. The serif font is perhaps closer to the traditional brush stroke (as is the Roman serif fonts closer to what was made by Romans using a chisel to carve letters in stones). But it is likely that most people writing Chinese characters by hand will first pick up a pen, not a brush, when learning to write Chinese. And pen strokes are by nature basically sans-serif.

bǐ
筆
笔
pen

bǐ
筆
笔
pen

```
1 \newfontfamily {\fntNotoSansCJK}[
2   ExternalLocation ,
3   Path             = {/xfonts/noto/} ,
4   Extension        = {.otf} ,
5   UprightFont      = {*-Regular} ,
6   BoldFont         = {*-Bold} ,
7   ItalicFont       = {*-DemiLight} ,
8   BoldItalicFont   = {*-Black} ,
9   Ligatures        = {NoCommon} ,% e.g. "fi" be represented as a single character?
10 ]{\NotoSansCJKtc}
```

shū 書 书 book upright	shū 書 书 book bold	shū 書 书 book italic	shū 書 书 book bold italic
----------------------------------	-------------------------------	---------------------------------	--------------------------------------

D.6 Ruby characters

Ruby characters are Asian characters with pronunciation symbols adjacent to that character. For traditional Chinese characters, the symbols are ZhuYin and are located to the right of the character.

我_{wo}看_{kan}到_{dao}你_{ni}

In this document, the font used to achieve this is

Wáng	Hàn	Zōng	zhōng	Míng	tǐ	zhù	yīn
王	漢	宗	中	明	體	注	音
王	漢	宗	中	明	體	注	音
King	the Han people	ancestor	medium	Míng Dynasty	style	to annotate	sound
						ZhuYin	

Font designer's name?

```

1 %
2 % Chinese typefaces with Zhuyin
3 % http://apt.nc.hcc.edu.tw/pub/FreeSoftware/free_fonts/wangttf/
4 %
5 \newfontfamily{\fntWangClearZY}{%
6   ExternalLocation,
7   Path             = {/xfonts/zht/},
8   Extension        = {.ttf},
9   UprightFont       = {wp010-05},
10  BoldFont          = {wp010-05},
11  ItalicFont         = {wp010-05},
12  BoldItalicFont    = {wp010-05},
13  }{wp010-05}

```

D.7 Simplified Chinese typesetting

Just as the Traditional Chinese glyphs, Simplified Chinese glyphs are from Google's Noto Sans CJK (both traditional and simplified are in the same OpenType files). But in this document, the simplified characters were not typed in directly, rather traditional characters were typed, and then mapped to simplified characters using a *TECKit mapping* in an X_YTEX environment with font feature specification as follows:

```
\newcommand{\fntzhs}{\fntNotoSansCJK\addfontfeatures{Mapping=../common/TECKit/zht2zhs}}
```

...where `zht2zhs` is a TECKit mapping compiled from a TECKit `zht2zhs.map` file which is about 3000 lines long and in part looks something like this:

```

1 ;=====
2 ; Variants to TECKit mapping file
3 ; Daniel J. Greenhoe
4 ;=====
5 ...
6 U+346F > U+3454 ; 37
7 U+3473 > U+3447 ; 38
8 U+3493 > U+20242 ; 41
9 U+34E8 > U+523E ; 52
10 U+35F2 > U+20D7E ; 68
11 U+361A > U+360E ; 72
12 U+3704 > U+36AF ; 87
13 U+370F > U+36E3 ; 88
14 ...

```

X_YTEX commands have also been defined such as the following:

```

1 \newcommand{\zhtss}[3]{%
2   \begin{tabular}[t]{@{}@{}}
3     \color{red}\footnotesize #2\
4     \color{black}\large{\fntzht #1}\
5     \color{black}\large{\fntzhs #1}\
6     \color{blue}\footnotesize #3\
7   \end{tabular}%
8   \index[xchar]{\fntzht #1/\fntzhs #1} (#2) #3
9   \index[xpinyin]{#2 ({\fntzht #1/\fntzhs #1}) #3}
10  \index[xeng]{#3 {\fntzht #1/\fntzhs #1} (#2)}
11 }

```

In the actual body of the document, the information for a character can be input as follows:

```
\zhtss{見}{ji/`an}{to see}
```

which writes index information to three different index files (a character index file, a PinYin index file, and an English word index file) and typesets glyphs as appearing to the right:

jiàn
見
见
to see

Note that it is arguably safer to map from traditional to simplified rather than the converse because the traditional to simplified mapping tends to be *many-to-one*. An example is the set of traditional characters {干, 幹, 乾}, which all map to the simplified character 干.¹

U+4E7E	U+5E72	U+5E79
gān	gān	gàn
乾	干	幹
干	干	干
dry	to offend	tree trunk
U+5E72	U+5E72	U+5E72

However, this is not always the case.

Sometimes the traditional to simplified mapping is *one-to-many*.²

traditional		simplified	PinYin	meaning	Unicode
徵	←	征	zhēng	to invade	U+5FB5 ← U+5F81
徵	←	徵	zhēng	to summon	U+5FB5 ← U+5FB5

D.8 Generating the zht2zhs TEckit map file

As indicated previously, this document supports both traditional and simplified characters where the simplified is in most all cases mapped, when necessary, from the traditional using the TEckit map “zht2zhs.map”. A mapping is “necessary” when there is “variation” between the two for a given character.

The traditional-simplified variants are identified in a document from www.unicode.org called “Unihan_Variants.txt”. Version 10.0.0, for example, of this file can be found in “Unihan.zip” at <https://www.unicode.org/Public/10.0.0/ucd/>.

For this document, “zht2zhs.map” was generated from “Unihan_Variants.txt” using a simple command line utility compiled from the C source file called “var2map.c” resulting in a program which can be used like this:

```
var2map.exe Unihan_Variants_10-0-0.txt zht2zhs_10-0-0.map
```

To download the C source, go to <https://github.com/dgreenhoe/unihan>.

D.9 Default bullet

The ship appearing throughout this text is loosely based on the *Golden Hind*, a sixteenth century English galleon famous for circumnavigating the globe.³ The ship image as appears in this document was rendered using PStricks packages using code which includes something like that listed below:



```
1 %-----
2 % forward and middle mast and sails
3 %-----
```

² <http://hanzidb.org/character-list/multiple-simplified-variants>

³ Paine (2000): *Warships of the World to 1900* page 63 (Golden Hind)

```

4 | {\psset{fillstyle=gradient}}%
5 | \multirput(21,31)(38,-6){2}{% forward and middle masts and sails
6 |   \pscustom[linewidth=2pt,arrows=-]{% upper sail
7 |     \pscurve(-18,8)(-20,22)(-8,36)%
8 |     \psline(-8,36)(8,52)%
9 |     \pscurve(8,52)(9,42)(14,40)%
10 |    \pscurve(14,40)(2,30)(-18,8)%
11 |   }%
12 | \pscustom[linewidth=2pt,arrows=-]{% lower sail
13 |   \psline(-16,8)(16,40)%
14 |   \pscurve(16,40)(12,28)(16,20)%
15 |   \psline(16,20)(-16,-8)%
16 |   \pscurve(-16,-8)(-20,2)(-16,8)%
17 | }%
18 | \psline[linewidth=10pt](-17,28)(8,52)% upper crossbeam
19 | \psline[linewidth=10pt](-16,8)(16,40)% lower crossbeam
20 | \psline[linewidth=10pt](0,0)(0,50)% vertical mast
21 | }%

```

APPENDIX E

SOURCE CODE

E.1 TECKit map files

Here are some TECKit mapping files for use with X_YTEX useful for typesetting Mandarin related phonetic symbols. To download these map files, go to <https://github.com/dgreenhoe/teckitmaps>.

E.1.1 PinYin mapping

The following TECKit map file `punctuation.map` is useful for typesetting PinYin:

```
1 ;=====
2 ; Variants to TECKit mapping file
3 ; Input file name: Unihan_Variants.txt
4 ; Output file name: Unihan_Variants.txt
5 ; Daniel J. Greenhoe
6 ;
7 ; References:
8 ;
9 ; 1. TIPA version 1.3 http://www.ctan.org/pkg/tipa
10 ; 2. Unicode standard 6.0, IPA Extensions, http://unicode.org/charts/PDF/U0250.pdf
11 ; 3. Handbook of the International Phonetic Association;
12 ;   A guide to the use of the International Phonetic Alphabet
13 ;   Cambridge University Press, 1999, isbn 978-0-521-63751-0 (paperback)
14 ; 4. symbol names: http://www.unicode.org/Public/UNIDATA/UnicodeData.txt
15 ;=====
16 ;
17 ;=====
18 ; Header information
19 ;=====
20 ; EncodingName      "punctuation"
21 ; DescriptiveName   "Punctuation"
22 ; LHSName           "punctuation-codes"
23 ; RHSName           "unicode-punctuation"
24 ; LHSDescription    "punctuation symbols"
25 ; RHSDescription    "Unicode 6.0 symbols"
26 ; LHSFlags          ()
27 ; RHSFlags          ()
28 ; Version           "0"
29 ; Contact           "Daniel J. Greenhoe, mailto:dgreenhoe@gmail.com"
30 ; RegistrationAuthority ""
31 ; RegistrationName  "ascii-uipa"
32 ;
33 ;=====
```

```

34 ; Macros
35 ;=====
36 Define BSL reverse_solidus ; U+005C
37 Define FSL solidus ; U+002F /
38 Define COL colon ; U+003A :
39 Define SCO semicolon ; U+003B ;
40 Define AST asterisk ; U+002A *
41 Define LCB left_curly_bracket ; U+007B {
42 Define RCB right_curly_bracket ; U+007D }
43 Define HYP hyphen_minus ; U+002D -
44 Define EQU equals_sign ; U+003D =
45 Define GTS greater_than_sign ; U+003E >
46 Define EXM exclamation_mark ; U+0021 !
47 Define VLN vertical_line ; U+007C |
48 Define TIL tilde ; U+007E ~
49 Define PER full_stop ; U+002E .
50 ;
51 ;=====
52 ;pass(Byte) ; Byte==>Byte mapping pass
53 ;=====
54 ;
55 ;=====
56 ;pass(Byte_Unicode) ; Byte==>Unicode mapping pass
57 ;=====
58 ;
59 ;=====
60 ;pass(Unicode_Byte) ; Unicode==>Byte mapping pass
61 ;=====
62 ;
63 ;=====
64 ;pass(Unicode) ; Unicode==>Unicode mapping pass
65 ;=====
66 ;
67 ;
68 ;=====
69 grave_accent grave_accent <> left_double_quotation_mark ;` <> U+201C
70 quotation_mark <> right_double_quotation_mark ;" <> U+201D
71 hyphen_minus hyphen_minus hyphen_minus <> em_dash ;---<> U+2014
72 hyphen_minus hyphen_minus <> en_dash ;-- <> U+2013
73
74 ;-----
75 ; diacritics
76 ;-----
77 FSL latin_capital_letter_O latin_capital_letter_E <> latin_capital_ligature_OE ;/OE <>
   U+0152
78 FSL latin_small_letter_o latin_small_letter_e <> latin_small_ligature_oe ;/oe <>
   U+0153
79
80 FSL grave_accent latin_small_letter_a <> latin_small_letter_a_with_grave ;/`a <>
   U+00E0
81 FSL apostrophe latin_small_letter_a <> latin_small_letter_a_with_acute ;/'a <>
   U+00E1
82 FSL colon latin_small_letter_a <> latin_small_letter_a_with_diaeresis ;/:a <>
   U+00E4
83 FSL less_than_sign latin_small_letter_a <> latin_small_letter_a_with_circumflex ;/<a <>
   U+00E2
84 FSL HYP latin_small_letter_a <> latin_small_letter_a_with_macron ;/-a <>
   U+0101
85 FSL latin_small_letter_v latin_small_letter_a > latin_small_letter_a_with_caron ;/va <>
   U+01CE
86 FSL greater_than_sign latin_small_letter_a <> latin_small_letter_a_with_caron ;/>a <>
   U+01CE
87 FSL grave_accent latin_capital_letter_A <> latin_capital_letter_A_with_grave ;/`A <>
   U+00C0
88 FSL HYP latin_capital_letter_A <> latin_capital_letter_A_with_macron ;/-A <>
   U+
89 FSL apostrophe latin_capital_letter_A <> latin_capital_letter_A_with_acute ;/'A <>
   U+00C1
90 FSL less_than_sign latin_capital_letter_A <> latin_capital_letter_A_with_circumflex ;/<A <>
   U+00C2
91 FSL latin_small_letter_v latin_capital_letter_A > latin_capital_letter_A_with_caron ;/vA >
   U+01CD
92 FSL greater_than_sign latin_capital_letter_A <> latin_capital_letter_A_with_caron ;/>A <>
   U+01CD
93
94 FSL greater_than_sign latin_small_letter_s <> latin_small_letter_sharp_s ;/>s <>
   U+00DF German lower case sharp s

```


95	FSL greater_than_sign U+01CD German upper case sharp S	latin_capital_letter_S	<> latin_capital_letter_sharp_S	;/>S <>
96				
97				
98	FSL apostrophe U+0107	latin_small_letter_c	<> latin_small_letter_c_with_acute	;/ 'c <>
99	FSL less_than_sign U+0109	latin_small_letter_c	<> latin_small_letter_c_with_circumflex	;/< c <>
100	FSL latin_small_letter_v U+010D deprecated	latin_small_letter_c	> latin_small_letter_c_with_caron	;/vc >
101	FSL greater_than_sign U+010D	latin_small_letter_c	<> latin_small_letter_c_with_caron	;/>c <>
102	FSL semicolon U+00E7	latin_small_letter_c	<> latin_small_letter_c_with_cedilla	;/; c <>
103	FSL apostrophe U+0106	latin_capital_letter_C	<> latin_capital_letter_C_with_acute	;/ 'C <>
104	FSL less_than_sign U+0108	latin_capital_letter_C	<> latin_capital_letter_C_with_circumflex	;/< C <>
105	FSL latin_small_letter_v U+010C deprecated	latin_capital_letter_C	> latin_capital_letter_C_with_caron	;/vC >
106	FSL greater_than_sign U+010C	latin_capital_letter_C	<> latin_capital_letter_C_with_caron	;/>C <>
107	FSL semicolon U+00C7	latin_capital_letter_C	<> latin_capital_letter_C_with_cedilla	;/; C <>
108				
109	FSL latin_small_letter_v U+010F	latin_small_letter_d	<> latin_small_letter_d_with_caron	;/vd <>
110	FSL semicolon U+1E11	latin_small_letter_d	<> latin_small_letter_d_with_cedilla	;/; d <>
111	FSL latin_small_letter_v U+010E	latin_capital_letter_D	<> latin_capital_letter_D_with_caron	;/vD <>
112	FSL semicolon U+1E10	latin_capital_letter_D	<> latin_capital_letter_D_with_cedilla	;/; D <>
113				
114	FSL grave_accent U+00E8	latin_small_letter_e	<> latin_small_letter_e_with_grave	;/`e <>
115	FSL apostrophe U+00E9	latin_small_letter_e	<> latin_small_letter_e_with_acute	;/ 'e <>
116	FSL colon U+00EB	latin_small_letter_e	<> latin_small_letter_e_with_diaeresis	;/: e <>
117	FSL less_than_sign U+00EA	latin_small_letter_e	<> latin_small_letter_e_with_circumflex	;/< e <>
118	FSL latin_small_letter_v U+011B	latin_small_letter_e	> latin_small_letter_e_with_caron	;/ve <>
119	FSL greater_than_sign U+011B	latin_small_letter_e	<> latin_small_letter_e_with_caron	;/>e <>
120	FSL semicolon U+0229	latin_small_letter_e	<> latin_small_letter_e_with_cedilla	;/; e <>
121	FSL HYP U+0113	latin_small_letter_e	<> latin_small_letter_e_with_macron	;/-e <>
122	FSL HYP U+	latin_capital_letter_E	<> latin_capital_letter_E_with_macron	;/-E <>
123	FSL grave_accent U+00C8	latin_capital_letter_E	<> latin_capital_letter_E_with_grave	;/`E <>
124	FSL apostrophe U+00C9	latin_capital_letter_E	<> latin_capital_letter_E_with_acute	;/ 'E <>
125	FSL less_than_sign U+00CA	latin_capital_letter_E	<> latin_capital_letter_E_with_circumflex	;/< E <>
126	FSL latin_small_letter_v U+011A	latin_capital_letter_E	<> latin_capital_letter_E_with_caron	;/vE <>
127	FSL semicolon U+0228	latin_capital_letter_E	<> latin_capital_letter_E_with_cedilla	;/; E <>
128				
129	FSL less_than_sign U+011D	latin_small_letter_g	<> latin_small_letter_g_with_circumflex	;/< g <>
130	FSL semicolon U+0123	latin_small_letter_g	<> latin_small_letter_g_with_cedilla	;/; g <>
131	FSL HYP U+1E20	latin_small_letter_g	<> latin_small_letter_g_with_macron	;/-g <>
132	FSL less_than_sign U+011C	latin_capital_letter_G	<> latin_capital_letter_G_with_circumflex	;/< G <>
133	FSL semicolon U+0122	latin_capital_letter_G	<> latin_capital_letter_G_with_cedilla	;/; G <>
134				
135	FSL less_than_sign U+0125	latin_small_letter_h	<> latin_small_letter_h_with_circumflex	;/< h <>
136	FSL semicolon	latin_small_letter_h	<> latin_small_letter_h_with_cedilla	;/; h <>

137	FSL less_than_sign U+0124	latin_capital_letter_H	<>	latin_capital_letter_H_with_circumflex	;/<H <>
138	FSL semicolon U+0129	latin_capital_letter_H	<>	latin_capital_letter_H_with_cedilla	;/;H <>
139	FSL apostrophe U+00CD	latin_small_letter_i	<>	latin_small_letter_i_with_acute	;/ 'i <>
141	FSL grave_accent U+00EC	latin_small_letter_i	<>	latin_small_letter_i_with_grave	;/ `i <>
142	FSL less_than_sign U+00EE	latin_small_letter_i	<>	latin_small_letter_i_with_circumflex	;/<i <>
143	FSL greater_than_sign U+01D0	latin_small_letter_i	<>	latin_small_letter_i_with_caron	;/>i <>
144	FSL HYP U+012A	latin_small_letter_i	<>	latin_small_letter_i_with_macron	;/-i <>
145	FSL HYP U+	latin_capital_letter_l	<>	latin_capital_letter_l_with_macron	;/-l <>
146	FSL grave_accent U+00CC	latin_capital_letter_l	<>	latin_capital_letter_l_with_grave	;/ `l <>
147	FSL apostrophe U+00ED	latin_capital_letter_l	<>	latin_capital_letter_l_with_acute	;/ 'l <>
148	FSL less_than_sign U+00CE	latin_capital_letter_l	<>	latin_capital_letter_l_with_circumflex	;/<l <>
149	FSL less_than_sign U+0135	latin_small_letter_j	<>	latin_small_letter_j_with_circumflex	;/<j <>
151	FSL less_than_sign U+0134	latin_capital_letter_J	<>	latin_capital_letter_J_with_circumflex	;/<J <>
152	FSL semicolon U+0137	latin_small_letter_k	<>	latin_small_letter_k_with_cedilla	;/;k <>
154	FSL semicolon U+0136	latin_capital_letter_K	<>	latin_capital_letter_K_with_cedilla	;/;K <>
155	FSL latin_small_letter_v U+013E	latin_small_letter_l	<>	latin_small_letter_l_with_caron	;/v l <>
157	FSL semicolon U+013C	latin_small_letter_l	<>	latin_small_letter_l_with_cedilla	;/;l <>
158	FSL PER U+1E37	latin_small_letter_l	<>	latin_small_letter_l_with_dot_below	;/. l <>
159	FSL HYP U+0142	latin_small_letter_L	<>	latin_small_letter_L_with_stroke	;/-l <>
160	FSL latin_small_letter_v U+013D	latin_capital_letter_L	<>	latin_capital_letter_L_with_caron	;/vL <>
161	FSL semicolon U+013B	latin_capital_letter_L	<>	latin_capital_letter_L_with_cedilla	;/;L <>
162	FSL HYP U+0141	latin_capital_letter_L	<>	latin_capital_letter_L_with_stroke	;/-L <>
163	FSL grave_accent U+01F9	latin_small_letter_n	<>	latin_small_letter_n_with_grave	;/ `n <>
165	FSL apostrophe U+00F3	latin_small_letter_n	<>	latin_small_letter_n_with_acute	;/ 'n <>
166	FSL latin_small_letter_v U+0148	latin_small_letter_n	<>	latin_small_letter_n_with_caron	;/v n <>
167	FSL semicolon U+0146	latin_small_letter_n	<>	latin_small_letter_n_with_cedilla	;/;n <>
168	FSL PER U+1E47	latin_small_letter_n	<>	latin_small_letter_n_with_dot_below	;/. n <>
169	;FSL HYP U+0101	latin_small_letter_n	<>	latin_small_letter_n_with_macron	;/-n <>
170	FSL grave_accent U+01F8	latin_capital_letter_N	<>	latin_capital_letter_N_with_grave	;/ `N <>
171	FSL latin_small_letter_v U+0147	latin_capital_letter_N	<>	latin_capital_letter_N_with_caron	;/vN <>
172	FSL semicolon U+0145	latin_capital_letter_N	<>	latin_capital_letter_N_with_cedilla	;/;N <>
173	FSL apostrophe U+00F2	latin_small_letter_o	<>	latin_small_letter_o_with_acute	;/ 'o <>
175	FSL grave_accent U+00D2	latin_small_letter_o	<>	latin_small_letter_o_with_grave	;/ `o <>
176	;FSL FSL U+00D8	latin_small_letter_o	<>	latin_small_letter_o_with_stroke	;/ /o <>
177	FSL EXM U+00D8	latin_small_letter_o	<>	latin_small_letter_o_with_stroke	;/ !o <>

178	FSL quotation_mark U+0151	latin_small_letter_o	<>	latin_small_letter_o_with_double_acute	;/ " o <>
179	FSL colon U+00F6	latin_small_letter_o	<>	latin_small_letter_o_with_diaeresis	;/ : o <>
180	FSL less_than_sign U+00F4	latin_small_letter_o	<>	latin_small_letter_o_with_circumflex	;/ < o <>
181	FSL quotation_mark U+0050	latin_small_letter_o	<>	latin_small_letter_o_with_double_acute	;/ " o <>
182	FSL HYP U+014D	latin_small_letter_o	<>	latin_small_letter_o_with_macron	;/ - o <>
183	FSL EQU U+014D	latin_small_letter_o	>	latin_small_letter_o_with_macron	;/ = o <>
184	FSL greater_than_sign U+01D2	latin_small_letter_o	<>	latin_small_letter_o_with_caron	;/ > o <>
185	; FSL FSL U+00F8	latin_capital_letter_O	<>	latin_capital_letter_O_with_stroke	;/ / O <>
186	FSL EXM U+00F8	latin_capital_letter_O	<>	latin_capital_letter_O_with_stroke	;/ ! O <>
187	FSL grave_accent U+00C8	latin_capital_letter_O	<>	latin_capital_letter_O_with_grave	;/ ` O <>
188	FSL apostrophe U+00D3	latin_capital_letter_O	<>	latin_capital_letter_O_with_acute	;/ ' O <>
189	FSL quotation_mark U+0150	latin_capital_letter_O	<>	latin_capital_letter_O_with_double_acute	;/ " O <>
190	FSL less_than_sign U+00D4	latin_capital_letter_O	<>	latin_capital_letter_O_with_circumflex	;/ < O <>
191	FSL quotation_mark U+0151	latin_capital_letter_O	<>	latin_capital_letter_O_with_double_acute	;/ " O <>
192					
193	FSL latin_small_letter_v U+0159	latin_small_letter_r	<>	latin_small_letter_r_with_caron	;/ v r <>
194	FSL semicolon U+0157	latin_small_letter_r	<>	latin_small_letter_r_with_cedilla	;/ ; r <>
195	FSL latin_small_letter_v U+0158	latin_capital_letter_R	<>	latin_capital_letter_R_with_caron	;/ v R <>
196	FSL semicolon U+0156	latin_capital_letter_R	<>	latin_capital_letter_R_with_cedilla	;/ ; R <>
197					
198	FSL less_than_sign U+015D	latin_small_letter_s	<>	latin_small_letter_s_with_circumflex	;/ < s <>
199	FSL latin_small_letter_v U+0161	latin_small_letter_s	<>	latin_small_letter_s_with_caron	;/ v s <>
200	FSL semicolon U+015F	latin_small_letter_s	<>	latin_small_letter_s_with_cedilla	;/ ; s <>
201	FSL apostrophe U+015B	latin_small_letter_s	<>	latin_small_letter_s_with_acute	;/ ' s <>
202	FSL less_than_sign U+015C	latin_capital_letter_S	<>	latin_capital_letter_S_with_circumflex	;/ < S <>
203	FSL latin_small_letter_v U+0160	latin_capital_letter_S	<>	latin_capital_letter_S_with_caron	;/ v S <>
204	FSL semicolon U+015E	latin_capital_letter_S	<>	latin_capital_letter_S_with_cedilla	;/ ; S <>
205					
206	FSL latin_small_letter_v U+0165	latin_small_letter_t	<>	latin_small_letter_t_with_caron	;/ v t <>
207	FSL semicolon U+0163	latin_small_letter_t	<>	latin_small_letter_t_with_cedilla	;/ ; t >
208	FSL latin_small_letter_v U+0164	latin_capital_letter_T	<>	latin_capital_letter_T_with_caron	;/ v T <>
209	FSL semicolon U+0162	latin_capital_letter_T	<>	latin_capital_letter_T_with_cedilla	;/ ; T <>
210					
211	FSL apostrophe U+00FA	latin_small_letter_u	<>	latin_small_letter_u_with_acute	;/ ' u <>
212	FSL grave_accent U+00F9	latin_small_letter_u	<>	latin_small_letter_u_with_grave	;/ ` u <>
213	FSL colon U+00FC	latin_small_letter_u	<>	latin_small_letter_u_with_diaeresis	;/ : u <>
214	FSL quotation_mark U+0171	latin_small_letter_u	<>	latin_small_letter_u_with_double_acute	;/ " u <>
215	; FSL quotation_mark U+0070	latin_small_letter_u	<>	latin_small_letter_u_with_double_acute	;/ " u <>
216	FSL less_than_sign U+00FB	latin_small_letter_u	<>	latin_small_letter_u_with_circumflex	;/ < u <>
217	FSL asterisk U+0165	latin_small_letter_u	<>	latin_small_letter_u_with_ring_above	;/ * u <>
218	FSL HYP	latin_small_letter_u	<>	latin_small_letter_u_with_macron	;/ - u <>



```

219 FSL EQU          U+016B          latin_small_letter_u      > latin_small_letter_u_with_macron      ;/=u <>
220 FSL HYP COL      U+016B          latin_small_letter_u      <> latin_small_letter_u_with_diaeresis_and_macron
      ;/ -:u <> U+01D6
221 FSL greater_than_sign latin_small_letter_u      <> latin_small_letter_u_with_caron          ;/>u <>
      U+01D4
222 FSL apostrophe COL latin_small_letter_u      <> latin_small_letter_u_with_diaeresis_and_acute ; /':u <>
      U+01D8
223 FSL greater_than_sign colon latin_small_letter_u      <>
      latin_small_letter_u_with_diaeresis_and_caron ; />:u <> U+01DA
224 FSL grave_accent colon latin_small_letter_u      <> latin_small_letter_u_with_diaeresis_and_grave ;
      /':u <> U+01DC
225 FSL HYP          U+          latin_capital_letter_U      <> latin_capital_letter_U_with_macron      ;/-U <>
      U+
226 FSL grave_accent latin_capital_letter_U      <> latin_capital_letter_U_with_grave          ;/'U <>
      U+00D9
227 FSL apostrophe latin_capital_letter_U      <> latin_capital_letter_U_with_acute          ;/'U <>
      U+00DA
228 FSL quotation_mark latin_capital_letter_U      <> latin_capital_letter_U_with_double_acute ;/'U <>
      U+0170
229 FSL colon          U+00DC          latin_capital_letter_U      <> latin_capital_letter_U_with_diaeresis      ;/:U <>
230 FSL less_than_sign latin_capital_letter_U      <> latin_capital_letter_U_with_circumflex      ;/<U <>
      U+00DB
231 FSL quotation_mark latin_capital_letter_U      <> latin_capital_letter_U_with_double_acute ;/'O <>
      U+0171
232 FSL greater_than_sign latin_capital_letter_U      <> latin_capital_letter_U_with_caron          ;/>U <>
      U+01D3
233 FSL grave_accent latin_small_letter_w      <> latin_small_letter_w_with_grave          ;/'w <>
      U+1E81
235 FSL less_than_sign latin_small_letter_w      <> latin_small_letter_w_with_circumflex      ;/<w <>
      U+0175
236 FSL grave_accent latin_capital_letter_W      <> latin_capital_letter_W_with_grave          ;/'W <>
      U+1E80
237 FSL less_than_sign latin_capital_letter_W      <> latin_capital_letter_W_with_circumflex      ;/<W <>
      U+0174
238 FSL apostrophe latin_small_letter_y      <> latin_small_letter_y_with_acute          ;/'y <>
      U+00FD
240 FSL less_than_sign latin_small_letter_y      <> latin_small_letter_y_with_circumflex      ;/<y <>
      U+0177
241 FSL apostrophe latin_capital_letter_Y      <> latin_capital_letter_Y_with_acute          ;/'Y <>
      U+00DD
242 FSL less_than_sign latin_capital_letter_Y      <> latin_capital_letter_Y_with_circumflex      ;/<Y <>
      U+0176
243 FSL HYP          U+0232          latin_small_letter_y      <> latin_small_letter_y_with_macron      ;/-y <>
244 FSL latin_small_letter_v latin_small_letter_z      <> latin_small_letter_z_with_caron          ;/vz <>
      U+017E
246 FSL latin_small_letter_v latin_capital_letter_Z      <> latin_capital_letter_Z_with_caron          ;/vZ <>
      U+017D

```

E.1.2 IPA mapping

The following TECKit map file `ascii-uipa.map` is useful for typesetting IPA:

```

1 ;=====
2 ; Variants to TECKit mapping file
3 ; Input file name: UniHan_Variants.txt
4 ; Output file name: UniHan_Variants.txt
5 ; Daniel J. Greenhoe
6 ;
7 ; This map file may be compiled using the program with parameter
8 ;   teckit_compile.exe ascii-uipa.map
9 ; to produce the file asii-uipa.tec .
10 ; This file can in turn be used within an XeLaTeX environment.
11 ;
12 ; References:

```

```

13 ; -----
14 ; 1. TIPA version 1.3  http://www.ctan.org/pkg/tipa
15 ; 2. Unicode standard 6.0, IPA Extensions, http://unicode.org/charts/PDF/U0250.pdf
16 ; 3. Handbook of the International Phonetic Association;
17 ;   A guide to the use of the International Phonetic Alphabet
18 ;   Cambridge University Press, 1999, isbn 978-0-521-63751-0 (paperback)
19 ; 4. symbol names: http://www.unicode.org/Public/UNIDATA/UnicodeData.txt
20 ; 5. pronunciation: http://www.internationalphoneticalphabet.org/ipa-sounds/ipa-chart-with-sounds/
21 ;=====
22 ;
23 ;=====
24 ; Header information
25 ;=====
26 ; EncodingName      "tipa13-tipa-2011"
27 ; DescriptiveName   "ASCII to Unicode 6.0 IPA symbols"
28 ; LHSName           "ascii-symbols"
29 ; RHSName           "unicode60-ipa"
30 ; LHSDescription    "ASCII symbols"
31 ; RHSDescription    "Unicode 6.0 IPA symbols"
32 ; LHSFlags          ()
33 ; RHSFlags          ()
34 ; Version           "0"
35 ; Contact           "Daniel J. Greenhoe, mailto:dgreenhoe@gmail.com"
36 ; RegistrationAuthority ""
37 ; RegistrationName   "ascii-uipa"
38 ;
39 ;=====
40 ; Macros
41 ;=====
42 Define BSL reverse_solidus ; U+005C
43 Define FSL solidus ; U+002F /
44 Define COL colon ; U+003A :
45 Define SCO semicolon ; U+003B ;
46 Define AST asterisk ; U+002A *
47 Define LCB left_curly_bracket ; U+007B {
48 Define RCB right_curly_bracket ; U+007D }
49 Define HYP hyphen_minus ; U+002D -
50 Define GTS greater_than_sign ; U+003E >
51 Define EXM exclamation_mark ; U+0021 !
52 Define QUM question_mark ; U+003F ?
53 Define VLN vertical_line ; U+007C |
54 Define TIL tilde ; U+007E ~
55 Define PER full_stop ; U+002E .
56 Define COM comma ; U+002C ,
57 ;
58 ;=====
59 ;pass(Byte) ; Byte==>Byte mapping pass
60 ;=====
61 ;
62 ;=====
63 ;pass(Byte_Unicode) ; Byte==>Unicode mapping pass
64 ;=====
65 ;
66 ;=====
67 ;pass(Unicode_Byte) ; Unicode==>Byte mapping pass
68 ;=====
69 ;
70 ;=====
71 pass(Unicode) ; Unicode==>Unicode mapping pass
72 ;=====
73 ;-----
74 ; modifiers
75 ;-----
76 quotation_mark <> modifier_letter_vertical_line ; tipa | U+0022 <>
77   U+02C8 (primary stress)
78 quotation_mark quotation_mark <> modifier_letter_low_vertical_line ; tipa | "" <>
79   U+02CC (secondary stress)
80 grave_accent > modifier_letter_low_vertical_line ; | U+0060 <>
81   U+02CC (secondary stress)
82 FSL COL > modifier_letter_triangular_colon ; | /: >
83   U+02D0 (long vowel)
84 ;
85 ;-----
86 ; plosive sounds
87 ;-----
88 ;p ; tipa | U+0070 <>
      U+0070 (voiceless bilabial plosive)

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85 ;b                                ;tipa| U+0062 <>
      U+0062 (voiced bilabial plosive)
86 ;t                                ;tipa| U+0074 <>
      U+0074 (voiceless alveolar plosive)
87 ;d                                ;tipa| U+0064 <>
      U+0064 (voiced alveolar plosive)
88 BSL COL latin_small_letter_t <> latin_small_letter_t_with_retroflex_hook ;tipa| \:t <>
      U+0288 (voiceless retroflex plosive)
89 FSL COL latin_small_letter_t > latin_small_letter_t_with_retroflex_hook ; | /:t <>
      U+0288 (voiceless retroflex plosive)
90 BSL COL latin_small_letter_d <> latin_small_letter_d_with_tail ;tipa| \:d <>
      U+0256 (voiced retroflex plosive)
91 FSL COL latin_small_letter_d > latin_small_letter_d_with_tail ; | /:d <>
      U+0256 (voiced retroflex plosive)
92 ;c                                ;tipa| U+0063 <>
      U+0063 (voiceless palatal plosive)
93 ;\textbardotless <> latin_small_letter_dotless_j_with_stroke ;tipa| ... <>
      U+025F (voiced palatal plosive)
94 FSL colon latin_small_letter_j > latin_small_letter_dotless_j_with_stroke ; | /:j <>
      U+025F (voiced palatal plosive)
95 ;k                                ;tipa| U+006B <>
      U+006B (voiceless velar plosive)
96 latin_small_letter_g <> latin_small_letter_script_g ;tipa| U+0067 <>
      U+0261 (voiced velar plosive)
97 ;q                                ;tipa| U+0071 <>
      U+0071 (voiceless uvular plosive)
98 BSL SCO latin_capital_letter_G <> latin_letter_small_capital_G ;tipa| \;G <>
      U+0262 (voiced uvular plosive)
99 FSL SCO latin_capital_letter_G > latin_letter_small_capital_G ; | /;G <>
      U+0262 (voiced uvular plosive)
100 latin_capital_letter_P <> latin_letter_glottal_stop ;tipa| U+0050 <>
      U+0294 (voiceless glottal plosive)
101 ;\textbarglottal_stop <> latin_letter_glottal_stop_with_stroke ;tipa| <>
      U+02A1 (voiced epiglottal plosive)
102 FSL COL latin_capital_letter_P <> latin_letter_glottal_stop_with_stroke ; | /:P <>
      U+02A1 (voiced epiglottal plosive)
103 ;
104 ;-----
105 ; implosive sounds
106 ;-----
107 BSL EXM latin_small_letter_b <> latin_small_letter_b_with_hook ;tipa| \!b <>
      U+0253 (voiced bilabial implosive)
108 FSL EXM latin_small_letter_b > latin_small_letter_b_with_hook ; | /!b <>
      U+0253 (voiced bilabial implosive)
109 BSL EXM latin_small_letter_d <> latin_small_letter_d_with_hook ;tipa| \!d <>
      U+0257 (voiced dental or alveolor implosive)
110 FSL EXM latin_small_letter_d > latin_small_letter_d_with_hook ; | /!d <>
      U+0257 (voiced dental or alveolor implosive)
111 BSL EXM latin_small_letter_g <> latin_small_letter_g_with_hook ;tipa| \!d <>
      U+0260 (voiced velar implosive)
112 FSL EXM latin_small_letter_g > latin_small_letter_g_with_hook ; | /!d <>
      U+0260 (voiced velar implosive)
113 BSL EXM latin_small_letter_j <> latin_small_letter_dotless_j_with_stroke_and_hook ;tipa| \!j <>
      U+0284 (voiced palatal implosive)
114 FSL EXM latin_small_letter_j > latin_small_letter_dotless_j_with_stroke_and_hook ; | /!j <>
      U+0284 (voiced palatal implosive)
115 BSL EXM latin_capital_letter_G <> latin_letter_small_capital_G_with_hook ;tipa| \!G <>
      U+029B (voiced uvular implosive)
116 FSL EXM latin_capital_letter_G > latin_letter_small_capital_G_with_hook ; | /!G <>
      U+029B (voiced uvular implosive)
117 ;\texthtq <> latin_small_letter_q_with_hook ;tipa| <>
      U+02A0 (voiceless uvular implosive)
118 FSL SCO latin_small_letter_q <> latin_small_letter_q_with_hook ; | /;q <>
      U+02A0 (voiceless uvular implosive)
119 ;
120 ;-----
121 ; affricate sounds
122 ;-----
123 FSL latin_small_letter_t latin_capital_letter_S <> latin_small_letter_tesh_digraph ; /tS
      <> U+02A7 (voiceless postalveolar affricate) e.g. "ch" in English
124 FSL latin_small_letter_c latin_small_letter_h <> latin_small_letter_tesh_digraph ; /ch
      > U+02A7 (voiceless postalveolar affricate) e.g. "ch" in English
125 FSL COL latin_small_letter_t latin_capital_letter_S > latin_small_letter_t_with_retroflex_hook
      latin_small_letter_s_with_hook ; /:tS <> U+0288 U+0282 (retroflex Chinese "chi")
126 FSL latin_small_letter_d latin_small_letter_z <> latin_small_letter_dz_digraph ; /dz
      <> U+02A3
127 FSL latin_small_letter_d latin_capital_letter_Z <> latin_small_letter_dz_digraph_with_curl ; /dZ

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    <> U+02A5 (voiced alveolo-palatal affricate)
128 FSL latin_small_letter_d latin_small_letter_j <> latin_small_letter_dezh_digraph ; /dj
    <> U+02A4 (voiced postalveolar affricate)
129 FSL latin_small_letter_t latin_small_letter_s <> latin_small_letter_ts_digraph ; /ts
    <> U+02A6 (voiceless dental affricate)
130 FSL SCO latin_small_letter_d latin_small_letter_z <> latin_small_letter_dz_digraph_with_curl ; /;dz
    <> U+02A5 (voiced alveolo-palatal affricate)
131 ;
132 ; \texttेशlig <> latin_small_letter_tesh_digraph ; tipa|
    <> U+02A7 (voiceless postalveolar affricate) e.g. "ch" in English
133 ; \textdyoghlig <> latin_small_letter_dezh_digraph ; tipa|
    <> U+02A4 (voiced postalveolar affricate)
134 ; \texttslig <> latin_small_letter_ts_digraph ; tipa|
    <> U+02A6 (voiceless dental affricate)
135 ; \textdctzlig <> latin_small_letter_dz_digraph_with_curl ; tipa|
    <> U+02A5 (voiced alveolo-palatal affricate)
136 ;
137 ;
138 ;-----
139 ; nasal sounds
140 ;-----
141 ; FSL PER latin_small_letter_d <> latin_small_letter_d_with_dot_below ; | /.d <> U+1E0D
142 FSL PER latin_small_letter_l <> latin_small_letter_l_with_dot_below ; | /.l <> U+1E37
143 ; m ; tipa| U+006D <> U+006D
    (voiced bilabial nasal)
144 latin_capital_letter_M <> latin_small_letter_m_with_hook ; tipa| U+004D <> U+0271
    (voiced labiodental nasal)
145 ; n ; tipa| U+006E <> U+006E
    (voiced alveolar nasal)
146 BSL COL latin_small_letter_n <> latin_small_letter_n_with_retroflex_hook ; tipa| \:n <> U+0273
    (voiced retroflex nasal)
147 FSL COL latin_small_letter_n > latin_small_letter_n_with_retroflex_hook ; | /:n <> U+0273
    (voiced retroflex nasal)
148 FSL PER latin_small_letter_n <> latin_small_letter_n_with_dot_below ; | /.n <> U+1E47
149 ; \textltailn <> latin_small_letter_n_with_left_hook ; tipa| <> U+0272
    (voiced palatal nasal)
150 FSL SCO latin_small_letter_n <> latin_small_letter_n_with_left_hook ; | /;n <> U+0272
    (voiced palatal nasal)
151 latin_capital_letter_N <> latin_small_letter_eng ; tipa| U+004E <> U+014B
    (voiced velar nasal)
152 BSL SCO latin_capital_letter_N <> latin_letter_small_capital_N ; tipa| \:N <> U+0274
    (voiced uvular nasal)
153 FSL SCO latin_capital_letter_N > latin_letter_small_capital_N ; | /;N <> U+0274
    (voiced uvular nasal)
154 ;
155 ;-----
156 ; trill sounds
157 ;-----
158 BSL SCO latin_capital_letter_B <> latin_letter_small_capital_B ; tipa| \:B <> U+0299
    (voiced bilabial trill)
159 FSL SCO latin_capital_letter_B > latin_letter_small_capital_B ; | /;B <> U+0299
    (voiced bilabial trill)
160 ; r ; tipa| U+0072 <> U+0072
    (voiced alveolar trill)
161 BSL SCO latin_capital_letter_R <> latin_letter_small_capital_R ; tipa| \:R <> U+0280
    (voiced uvular trill)
162 FSL SCO latin_capital_letter_R > latin_letter_small_capital_R ; | /;R <> U+0280
    (voiced uvular trill)
163 ;
164 ;-----
165 ; tap or flap sounds
166 ;-----
167 latin_capital_letter_R <> latin_small_letter_r_with_fishhook ; tipa| U+0052 <> U+027E
    (voiced alveolar flap or tap)
168 BSL COL latin_small_letter_r <> latin_small_letter_r_with_tail ; tipa| \:r <> U+027D
    (voiced retroflex flap)
169 FSL COL latin_small_letter_r > latin_small_letter_r_with_tail ; | /:r <> U+027D
    (voiced retroflex flap)
170 ; \textturnlongleg <> latin_small_letter_turned_r_with_long_leg ; tipa| <> U+027A
    (voiced lateral flap)
171 FSL SCO latin_small_letter_r <> latin_small_letter_turned_r_with_long_leg ; | /;r <> U+027A
    (voiced lateral flap)
172 ;
173 ;-----
174 ; fricative sounds
175 ;-----
176 latin_capital_letter_F <> latin_small_letter_phi ; tipa| U+0046 <> U+0278

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177      (voiceless bilabial fricative)
latin_capital_letter_B <> greek_small_letter_beta ;tipa| U+0042 <> U+03B2
178      (voiced bilabial fricative)
;f ;tipa| U+0066 <> U+0066
179      (voiceless labiodental fricative)
;v ;tipa| U+0076 <> U+0076
180      (voiced labiodental fricative)
latin_capital_letter_T <> greek_small_letter_theta ;tipa| U+0054 <> U+03B8
181      (voiceless dental fricative)
latin_capital_letter_D <> latin_small_letter_eth ;tipa| U+0044 <> U+00F0
182      (voiced dental fricative)
;s ;tipa| U+0073 <> U+0073
183      (voiceless alveolar fricative)
;z ;tipa| U+007A <> U+007A
184      (voiced alveolar fricative)
latin_capital_letter_S <> latin_small_letter_esh ;tipa| U+0053 <> U+0283
185      (voiceless postalveolar fricative)
latin_capital_letter_Z <> latin_small_letter_ezh ;tipa| U+005A <> U+0292
186      (voiced postalveolar fricative)
BSL COL latin_small_letter_s <> latin_small_letter_s_with_hook ;tipa| \:s <> U+0282
187      (voiceless retroflex fricative)
FSL COL latin_small_letter_s > latin_small_letter_s_with_hook ; | /:s <> U+0282
188      (voiceless retroflex fricative)
BSL COL latin_small_letter_z <> latin_small_letter_z_with_retroflex_hook ;tipa| \:z <> U+0290
189      (voiced retroflex fricative)
FSL COL latin_small_letter_z > latin_small_letter_z_with_retroflex_hook ; | /:z <> U+0290
190      (voiced retroflex fricative)
BSL latin_small_letter_c LCB latin_small_letter_c RCB <> latin_small_letter_c_with_cedilla ;tipa|
\c{c} <> U+00E7 (voiceless palatal fricative)
191 ;FSL latin_small_letter_c LCB latin_small_letter_c RCB > latin_small_letter_c_with_cedilla ; /c{c}
<> U+00E7 (voiceless palatal fricative)
192 FSL latin_small_letter_c latin_small_letter_c > latin_small_letter_c_with_cedilla ; /cc > U+00E7
(voiceless palatal fricative)
193 latin_capital_letter_J <> latin_small_letter_j_with_crossed_tail ;tipa| U+004A <> U+029D
(voiced palatal fricative)
194 ;x ;tipa| U+0078 <> U+0078
195      (voiceless velar fricative)
latin_capital_letter_G <> latin_small_letter_gamma ;tipa| U+0048 <> U+0263
196      (voiced velar fricative)
latin_capital_letter_X <> greek_small_letter_chi ;tipa| U+0058 <> U+03C7
197      (voiceless uvular fricative)
latin_capital_letter_K <> latin_letter_small_capital_inverted_R ;tipa| U+004B <> U+0281
198      (voiced uvular fricative)
;\textcrh <> latin_small_letter_h_with_stroke ;tipa| <> U+0127
199      (voiceless pharyngeal fricative)
FSL hyphen_minus latin_small_letter_h <> latin_small_letter_h_with_stroke ; | /-h > U+0127
200      (voiceless pharyngeal fricative)
latin_capital_letter_Q <> latin_letter_pharyngeal_voiced_fricative ;tipa| U+0051 <> U+0295
201      (voiced pharyngeal fricative)
;h ;tipa| U+0068 <> U+0068
202      (voiceless glottal fricative)
latin_capital_letter_H <> latin_small_letter_h_with_hook ;tipa| U+0048 <> U+0266
203      (voiced glottal fricative)
latin_capital_letter_C <> latin_small_letter_c_with_curl ;tipa| U+0043 <> U+0255
204      (voiceless alveolo-palatal laminal fricative)
FSL SCO latin_small_letter_h <> latin_small_letter_heng_with_hook ;tipa| /;h <> U+0267
205      (voiceless coarticulated velar and palatoalveolar fricative)
;\textctesh <> latin_small_letter_esh_with_curl ;tipa| <> U+0286
206      (voiceless palatalized postalveolar fricative)
FSL SCO latin_capital_letter_S <> latin_small_letter_esh_with_curl ; | /;S <> U+0286
207      (voiceless palatalized postalveolar fricative)
;\textctz <> latin_small_letter_z_with_curl ;tipa| <> U+0291
208      (voiced alveolo-palatal laminal fricative)
FSL SCO latin_small_letter_z <> latin_small_letter_z_with_curl ; | <> U+0291
209      (voiced alveolo-palatal laminal fricative)
;\textctyogh <> latin_small_letter_ezh_with_curl ;tipa| <> U+0291
210      (voiced alveolo-palatal laminal fricative)
FSL SCO latin_capital_letter_Z <> latin_small_letter_ezh_with_curl ; | <> U+0293
211      (voiced palatalized postalveolar fricative)
BSL SCO latin_capital_letter_H <> latin_letter_small_capital_H ;tipa| \;H <> U+029C
212      (voiceless epiglottal fricative)
FSL SCO latin_capital_letter_H > latin_letter_small_capital_H ; | /;H <> U+029C
213      (voiceless epiglottal fricative)
;\textbarrevglotstop <> latin_letter_reversed_glottal_stop_with_stroke ;tipa| <> U+02A2
214      (voiced epiglottal fricative)
FSL COL latin_capital_letter_Q <> latin_letter_reversed_glottal_stop_with_stroke ; | /:Q< > U+02A2
(voiced epiglottal fricative)

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215 ;
216 -----
217 ; lateral fricative
218 -----
219 ;\textbeltl <> latin_small_letter_l_with_belt ;tipa| <> U+026C
      (voiceless alveolar lateral fricative)
220 FSL HYP latin_small_letter_l <> latin_small_letter_l_with_belt ; | /-l <> U+026C
      (voiceless alveolar lateral fricative)
221 ;\textlyoghlig <> latin_small_letter_lezh ;tipa| <> U+026E
      (voiced alveolar lateral fricative)
222 FSL SCO latin_small_letter_l <> latin_small_letter_lezh ; /;l <> U+026E
      (voiced alveolar lateral fricative)
223 ;
224 -----
225 ; approximant sounds
226 -----
227 latin_capital_letter_V <> latin_small_letter_v_with_hook ;tipa| U+0056 <> U+028B
      (voiced labiodental approximate)
228 BSL AST latin_small_letter_r <> latin_small_letter_turned_r ;tipa| \*r <> U+0279
      (voiced alveolar approximant)
229 FSL AST latin_small_letter_r > latin_small_letter_turned_r ; | /*r <> U+0279
      (voiced alveolar approximant)
230 BSL COL latin_capital_letter_R <> latin_small_letter_turned_r_with_hook ;tipa| \:R <> U+027B
      (voiced retroflex approximant)
231 FSL COL latin_capital_letter_R > latin_small_letter_turned_r_with_hook ; | /:R <> U+027B
      (voiced retroflex approximant)
232 ; latin_capital_letter_Q > latin_small_letter_turned_r ; | U+0051 <> U+0279
      (voiced alveolar approximant)
233 ; latin_small_letter_r > latin_small_letter_turned_R ; | U+0072 <> U+0279
      (voiced alveolar approximant)
234 ;
235 ;j ;tipa| U+006A <> U+006A
      (voiced palatal approximant)
236 ;\textturnmrleg <> latin_small_letter_turned_m_with_long_leg ;tipa| <> U+0270
      (voiced velar approximant)
237 FSL AST latin_small_letter_m > latin_small_letter_turned_m_with_long_leg ; | /*m <> U+0270
      (voiced velar approximant)
238 digit_four <> latin_small_letter_turned_h ;tipa| U+0034 <> U+0265
      (voiced rounded palatal approximant)
239 BSL AST latin_small_letter_w <> latin_small_letter_turned_w ;tipa| \*w <> U+028D
      (voiceless rounded labiovelar approximant)
240 FSL AST latin_small_letter_w > latin_small_letter_turned_w ; | /*w <> U+028D
      (voiceless rounded labiovelar approximant)
241 FSL latin_small_letter_h latin_small_letter_w <> modifier_letter_small_h_with_hook
      latin_small_letter_w ; | /hw <> U+02B1 U+028D (aspirated w as in
      "white")
242 ;
243 ;
244 -----
245 ; lateral approximant sounds
246 ; l ;tipa| U+006C <> U+006C
      (voiced alveolar lateral approximant)
247 -----
248 BSL COL latin_small_letter_l <> latin_small_letter_l_with_retroflex_hook ;tipa| \:l <> U+026D
      (voiced retroflex lateral approximant)
249 FSL COL latin_small_letter_l > latin_small_letter_l_with_retroflex_hook ; | /:l <> U+026D
      (voiced retroflex lateral approximant)
250 latin_capital_letter_L <> latin_small_letter_turned_y ;tipa| U+004C <> U+028E
      (voiced palatal lateral approximant)
251 BSL SCO latin_capital_letter_L <> latin_letter_small_capital_L ;tipa| \;L <> U+029F
      (voiced velar lateral approximant)
252 FSL SCO latin_capital_letter_L > latin_letter_small_capital_L ; | /;L <> U+029F
      (voiced velar lateral approximant)
253 BSL VLN TIL digit_one <> latin_small_letter_l_with_middle_tilde ;tipa| \|~1 <> U+026B
      (velarized voiced alveolar lateral approximant)
254 ;FSL VLN TIL digit_one > latin_small_letter_l_with_middle_tilde ; | /|~1 <> U+026B
      (velarized voiced alveolar lateral approximant)
255 FSL VLN digit_one > latin_small_letter_l_with_middle_tilde ; | /|1 <> U+026B
      (velarized voiced alveolar lateral approximant)
256 ;
257 -----
258 ; close vowel sounds
259 -----
260 ; i ;tipa| (close front
      unrounded vowel)
261 ; y ;tipa| (close front
      rounded vowel)

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262 digit_one          <> latin_small_letter_i_with_stroke ;tipa| U+0031 <> U+0268 (close central
      unrounded vowel)
263 digit_zero        <> latin_small_letter_u_bar          ;tipa| U+0030 <> U+0289 (close central
      rounded vowel)
264 latin_capital_letter_W <> latin_small_letter_turned_m    ;tipa| U+0057 <> U+026F (close back
      unrounded vowel)
265 ;u                ;tipa| (close back
      rounded vowel)
266 ;
267 ;-----
268 ; semi-high vowel sounds
269 ;-----
270 latin_capital_letter_I <> latin_letter_small_capital_I    ;tipa| U+0049 <> U+026A (semi-high
      front unrounded vowel)
271 latin_capital_letter_Y <> latin_letter_small_capital_Y    ;tipa| U+0059 <> U+028F (semi-high
      front rounded vowel)
272 latin_capital_letter_U <> latin_small_letter_upsilon      ;tipa| U+0055 <> U+028A (semi-high back
      rounded vowel)
273 ; FSL latin_capital_letter_U > latin_letter_small_capital_U ; | /U > U+1D1C (semi-high
      back rounded vowel), KK
274 ;FSL latin_capital_letter_U > U+1D1C ; | /U > U+1D1C (semi-high back rounded vowel), KK
275 FSL latin_capital_letter_U > latin_capital_letter_U ; | /U > U (semi-high back
      rounded vowel), KK
276 ;
277 ;-----
278 ; close-mid vowel sounds
279 ;-----
280 ;e                ;tipa| (close-mid
      front unrounded vowel)
281 ;o                ;tipa| U+006F <> U+006F (close-mid
      back rounded vowel)
282 BSL latin_small_letter_o <> latin_small_letter_o_with_stroke ;tipa| \o <> U+00F8 (close-mid
      front rounded vowel)
283 FSL latin_small_letter_o > latin_small_letter_o_with_stroke ; | /o <> U+00F8 (close-mid
      front rounded vowel)
284 digit_nine        <> latin_small_letter_reversed_e      ;tipa| U+0039 <> U+0258 (close-mid
      central unrounded vowel)
285 digit_eight       <> latin_small_letter_barred_o        ;tipa| U+0038 <> U+0275 (close-mid
      central rounded vowel)
286 digit_seven       <> latin_small_letter_rams_horn        ;tipa| U+0037 <> U+0264 (close-mid
      back unrounded vowel)
287 ;
288 ;-----
289 ;
290 ;-----
291 commercial_at     <> latin_small_letter_schwa           ;tipa| U+0040 <> U+0259 (mid central
      vowel)
292 FSL commercial_at latin_small_letter_r <> latin_small_letter_schwa_with_hook ;tipa| /@r <>
      U+025A (r-colored schwa)
293 FSL digit_three latin_small_letter_r <> latin_small_letter_reversed_open_e_with_hook ; /3r <>
      U+025D (rhotarized lower-mid central vowel)
294 ;
295 ;-----
296 ; open mid vowel sounds
297 ;-----
298 latin_capital_letter_E <> latin_small_letter_open_E      ;tipa|
      U+0045 <> U+025B (open-mid front unrounded vowel)
299 BSL latin_small_letter_o latin_small_letter_e <> latin_small_ligature_oe ;tipa| \oe
      <> U+0153 (open-mid front rounded vowel)
300 FSL latin_small_letter_o latin_small_letter_e <> latin_small_ligature_oe ; | /oe
      <> U+0153 (open-mid front rounded vowel)
301 FSL COL latin_small_letter_e <> latin_small_letter_closed_open_e ; | /:e
      <> U+029A (lower-mid front rounded vowel)
302 digit_three       <> latin_small_letter_reversed_open_E ;tipa|
      U+0033 <> U+025C (open mid central unrounded vowel)
303 ;\textclosevepsilon <> latin_small_letter_closed_reversed_open_e ;tipa|
      <> U+025E (open mid central rounded vowel)
304 FSL latin_small_letter_e <> latin_small_letter_closed_reversed_open_e ; | /e
      <> U+025E (open mid central rounded vowel)
305 digit_two         <> latin_small_letter_turned_V        ;tipa|
      U+0032 <> U+028C (lower-mid back unrounded vowel)
306 latin_capital_letter_O <> latin_small_letter_open_O      ;tipa|
      U+004f <> U+0254 (lower-mid back rounded vowel)
307 ;
308 ;-----
309 ; near-open vowel sounds
310 ;-----

```

```

311 BSL latin_small_letter_a latin_small_letter_e <> latin_small_letter_ae ;tipa| \ae <>
      U+00E6 (near-open front unrounded vowel)
312 FSL latin_small_letter_a latin_small_letter_e > latin_small_letter_ae ; | /ae <> U+00E6
313 digit_five <> latin_small_letter_turned_a ;tipa| U+0035 <>
      U+0250 (near-open central vowel)
314 ;
315 ;-----
316 ; open vowel sounds
317 ;-----
318 ;a ;tipa|
      (open front unrounded vowel)
319 BSL latin_capital_letter_O latin_capital_letter_E <> latin_letter_small_capital_OE ;tipa| \OE <>
      U+0276 (open front rounded vowel)
320 FSL latin_capital_letter_O latin_capital_letter_E > latin_letter_small_capital_OE ; | /OE <>
      U+0276 (open front rounded vowel)
321 latin_capital_letter_A <> latin_small_letter_alpha ;tipa| U+0041 <>
      U+0251 (open back unrounded vowel)
322 digit_six <> latin_small_letter_turned_alpha ;tipa| U+0036 <>
      U+0252 (open back rounded vowel)
323 ;
324 ;-----
325 ; apical vowel sounds
326 ;-----
327 FSL OOM latin_small_letter_r <> latin_small_letter_reversed_r_with_fishhook ;
      | /;r <> U+027F (apical dental vowel)
328 ;\textviby <> latin_small_letter_squat_reversed esh
      ;tipa| <> U+0285 (apical retroflex vowel)
329 ;\textlhtlongi <> latin_small_letter_reversed_r_with_fishhook
      ;tipa| <> U+027F (apical dental vowel)
330 ;
331 ;-----
332 ; Diacritics
333 ;-----
334 FSL GTS latin_small_letter_h <> modifier_letter_small_h ; />h <> U+02B0
335 ;
336 ;-----
337 ; clicks
338 ;-----
339 BSL AST latin_small_letter_t <> latin_small_letter_turned_t ;tipa| \*t <> U+0287 (dental
      click)
340 FSL AST latin_small_letter_t <> latin_small_letter_turned_t ; | /*t <> U+0287 (dental
      click)
341 ;\textObullseye <> latin_letter_bilabial_click ;tipa| <> U+0298
      (bilabial click)
342 FSL PER latin_capital_letter_O <> latin_letter_bilabial_click ; | /.O <> U+0298
      (bilabial click)
343 ;\textinvglotstop <> latin_letter_inverted_glottal_stop ;tipa| <> U+0296
      (alveolar lateral click)
344 FSL COL QUM <> latin_letter_inverted_glottal_stop ; | /:? <> U+0296
      (alveolar lateral click)
345 ;\textstretchc <> latin_letter_stretched_c ;tipa| <> U+0297 (palatal
      or alveolar click)
346 FSL COL latin_capital_letter_C <> latin_letter_stretched_c ; | /:C <> U+0297 (palatal
      or alveolar click)

```

E.1.3 Traditional to simplified character mapping

This is a large file (about 3000 lines) and so is not listed here. To download it, go to

 <https://github.com/dgreenhoe/unihan> or

 <https://github.com/dgreenhoe/teckitmaps>.

E.2 Unicode.org text file to TECKit map utility

For a description of this utility, see Section D.8 (page 59). To download C source, see <https://github.com/dgreenhoe/unihan>.

```

1  /*=====
2  * Daniel J. Greenhoe
3  * unicode variants text file to TECKit map file
4  *===== */
5
6
7  /*=====
8  * header files
9  *===== */
10 #include<stdio.h>
11 #include<stdlib.h>
12 #include<string.h>
13
14 /*=====
15 * internal prototypes
16 *===== */
17 int var2map(char *namein, char *nameout);
18
19 /*=====
20 * main
21 *===== */
22 int main(int argc, char *argv[]){
23     int rval;
24
25     srand((unsigned)time(NULL));
26
27     if(argc==3){
28         rval=var2map(argv[1],argv[2]);
29     }
30     else{
31         fprintf(stderr,"Usage:\n");
32         fprintf(stderr," %s <input Variants file> <output TECKit map file>\n",argv[0]);
33         fprintf(stderr,"For input file , see for example \"Unihan_Variants.txt\" in\n
34             \"http://www.unicode.org/Public/6.1.0/ucd/ Unihan-6.1.0d1.zip\"\n");
35         fprintf(stderr,"For example TECKit mapping files , see\n
36             \"http:// scripts.sil.org/cms/scripts/page.php?item_id=MappingFiles\"\n");
37
38         rval=-1;
39     }
40
41     if(rval)fprintf(stderr,"Error: rval=%d\n",rval);
42     return rval;
43 }
44
45 /*=====
46 * Variants to TECKit mapping file
47 * Input:  filename of Unihan_Variants.txt file (ASCII encoded)
48 *         see for example "Unihan_Variants.txt" in http://www.unicode.org/Public/6.1.0/ucd/
49 *         Unihan-6.1.0d1.zip
50 * Output: filename of TECKit mapping file
51 *         For examples see http:// scripts.sil.org/cms/scripts/page.php?item_id=MappingFiles
52 *===== */
53 int var2map(char *namein, char *nameout){
54     #define MAXLINE 1024
55     long i;
56     int j;
57     char *fval,*sval;
58     FILE *fpin,*fpout;
59     char buf[MAXLINE],buf2[MAXLINE];
60
61     fpin =fopen(namein,"r");
62     fpout=fopen(nameout,"w");
63     if(fpin==NULL){
64         fprintf(stderr,"Unable to open file %s\n",namein);
65         return -1;
66     }
67     if(fpout==NULL){
68         fprintf(stderr,"Unable to open file %s\n",nameout);
69         return -1;
70     }
71 }

```

```

67 fprintf(fpout, "=====\\n");
68 fprintf(fpout, " Variants to TEckit mapping file\\n");
69 fprintf(fpout, " Input file name: %s\\n", namein);
70 fprintf(fpout, " Output file name: %s\\n", namein);
71 fprintf(fpout, " Daniel J. Greenhoe \\n");
72 fprintf(fpout, "=====\\n");
73 fprintf(fpout, "\\n");
74 fprintf(fpout, "LHSName           \\zh-traditional\\n");
75 fprintf(fpout, "RHSName           \\zh-simplified\\n");
76 fprintf(fpout, "LHSDescription       \\Unicode 6.1.0 traditional Chinese characters\\n");
77 fprintf(fpout, "RHSDescription       \\Unicode 6.1.0 simplified Chinese characters\\n");
78 fprintf(fpout, "Version              \\0\\n");
79 fprintf(fpout, "Contact              \\mailto:dgreenhoe@gmail.com\\n");
80 fprintf(fpout, "RegistrationAuthority \\Abstract Space Publishing\\n");
81 fprintf(fpout, "RegistrationName      \\zh-t2s-610\\n");
82 fprintf(fpout, "pass(Unicode)\\n"); /* allow unicode input and output */
83
84 for(i=1, fval=" "; fval!=NULL; i++){
85     fval=fgets(buf, MAXLINE, fpin);
86     sval=strchr(buf, '\\n');
87     if(sval!=NULL) *sval=NULL; /* remove newline character from string */
88     sval=strchr(buf, '#');
89     if(sval!=NULL) *sval=NULL; /* delete comments */
90     sval=strstr(buf, "kSimplifiedVariant");
91     if(sval!=NULL){
92         *sval = '>'; /* replace 'k' with mapping operator */
93         for(j=1; j<=17; j++) sval[j]=' '; /* replace "SimplifiedVariant" with spaces */
94         fprintf(fpout, "%s ; %6ld\\n", buf, i);
95     }
96 }
97 fclose(fpin);
98 fclose(fpout);
99 return 0;
100 }

```

--

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 今夕/今夕 (jīn xī) today, 50
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 他/他 (tā) he, 48
 仙/仙 (xiān) celestial being, 20
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 億/亿 (yì) 10⁸, 34
 優/优 (yōu) excellent; abundant, 40
 儼/俨 (yǎn) majestic; respectable, 39
 儿/儿 (rén) person, 19
 元/元 (Yúan) first, 42
 先生/先生 (xiān shēng) mister, 48, 49
 克/克 (kè) to overcome, 39
 入/入 (rù) to enter, 19
 全/全 (quán) completely, 51
 八/八 (bā) 8, 20
 八/八 (bā) eight, 10
 八/八 (bā) 8, 31–33
 公雞/公鸡 (gōng jī) rooster, 23
 六/六 (liu) 6, 31–33
 六/六 (qī) 7, 32
 共/共 (gòng) share, 52
 冰/冰 (biīng) ice, 43
 几/几 (jī) small table, 19
 凡/凡 (fán) all, 20
 凱/凯 (kǎi) peace, 38
 凱/凯 (kǎi) triumphant strains, 42
 刀/刀 (dāo) knife, 19
 初/初 (chū) first, 53
 別時/别时 (bié shí) time to

leave, 51
到處/到处 (dào chù) every-where, 48
剋/克 (kè) to overcome, 40
前/前 (qián) before, 53
劉/刘 (Liú) to kill, 36
力/力 (lì) force, 19
力/力 (lì) strength, 39
功/功 (gōng) merit; achieve-ment, 38
助/助 (zhù) to help, 40
勁/劲 (jìn) vigor, 38
勁/劲 (jìng) powerful, 40
勇/勇 (yǒng) courageous; fearless, 40
勤/勤 (qín) diligent; industri-ous, 39
勳/勳 (xūn) merits; honors, 39
包/包 (Bāo) to wrap, 36
匚/匚 (fāng) , 20
匠/匠 (jiàng) craftsman, 40
匡/匡 (Kuāng) to correct, 37
十/十 (shí) 10, 31, 32
十/十 (shí) 10, 32–34
千/千 (qiān) 1000, 33, 34
千里/千里 (qiān lǐ) long dis-tance, 52
協/协 (xié) to agree; to help, 39
南/南 (Nán) south, 37
博/博 (bó) extensive; abun-dant, 38
卜/卜 (Bǔ) to divine, 36
邵/邵 (shào) to encourage; graceful, 41
去/去 (qù) to go, 20
又/又 (yòu) but, 50
口/口 (kǒu) mouth, 20
古/古 (Gǔ) ancient, 37
古/古 (gǔ) ancient, 51
叩/叩 (kòu) to knock, 22, 23
叫/叫 (jiào) to call, 23
叭/叭 (bā) trumpet, 21
叮/叮 (dīng) to sting, 21
可/可 (Kě) to be able to, 38
史/史 (Shǐ) history, 36
各/各 (gè) each, 10
合/合 (hé) together, 51
向/向 (Xiàng) to face, 37
君/君 (jūn) monarch, 43, 44
吧/吧 (bā) (a particle), 21
吧/吧 (ba) (for suggestions), 10
吱/吱 (zī) a squeak, 23
吳/吴 (Wú) , 36, 44
吼/吼 (hǒu) to roar, 22
呀/呀 (yā) (sound), 48, 49
呂/吕 (Lǚ) , 36
呦/呦 (yōu) (sound), 48, 49
周/周 (Zhōu) , 44

周/周 (Zhōu) Zhou Dynasty, 36
呱/呱 (gūa) (onomatopoeia), 22
呱呱/呱呱 (gū gū) baby's cry, 48
呼/呼 (hū) to exhale, 22, 24
和/和 (hé) harmony, 38
咕/咕 (gū) to murmur, 21, 23
咕嚕/咕嚕 (gū lū) “gur-gle|hyperpage, 23
咚/咚 (dōng) (ono-matopoeia), 21
咩/咩 (miē) (onomatopoeia), 22
咯/咯 (gé) a click, 21
咻/咻 (xiū) din, 23
咿/咿 (yī) (sound), 48, 49
哇/哇 (wā) (a particle), 23
哈/哈 (hā) to breathe on, 22
哈啾/哈啾 (hā jiū) achoo, 23
哎/哎 (āi) (onomatopoeia), 21
哞/哞 (móu) (onomatopoeia), 22
哭/哭 (kū) to cry, 20
哲/哲 (zhé) a thinker; wise, 40
唐/唐 (Táng) the Tang Dy-nasty, 36
唧/唧 (jī) pump, 22
噲/噲 (yō) , 23
啊/啊 (ā) (onomatopoeia), 21
問/问 (wèn) ask, 50
啦/啦 (la) (onomatopoeia), 22
啪/啪 (pā) (onomatopoeia), 22
啾/啾 (jiū) chirping sound, 22
善/善 (shàn) good; virtuous, 39
喔/喔 (ō) (onomatopoeia), 22
喜/喜 (xǐ) a joyful thing, 42
單/单 (Shàn) , 37
單元音 (monophthongs), 3
喵/喵 (miāo) “meow|hyperpage, 22
喻/喻 (Yù) parable; to ex-plain, 37
嗒/嗒 (tà) dejected, 22
鳴/鸣 (wū) (onomatopoeia), 23
噲/噲 (wēng) (ono-matopoeia), 23
嗤/嗤 (chī) to sneer, 21
嗨/嗨 (hāi) “hi”, 22
嘩/哗 (bì) (onomatopoeia), 21
嗷/嗷 (áo) cry of hunger, 21
嘎/嘎 (gā) (onomatopoeia), 21
嘟/嘟 (dū) (onomatopoeia), 21

嘩/哗 (hūa) (onomatopoeia), 22
噤/噤 (jī) to talk indistinctly, 22
嘶/嘶 (sī) (onomatopoeia), 22
撲/撲 (pū) (onomatopoeia), 22
噹/当 (dāng) (ono-matopoeia), 21
嘍/嘍 (hùo) (onomatopoeia), 22
嚕/嚕 (lū) verbose, 22, 24
嚴/严 (Yán) stern; strict, 36
嚴/严 (yán) beautiful, 39
囉/啰 (lūo) to chatter, 22
四/四 (sì) 4, 33, 34
四/四 (sì) 4, 31–33
四/四 (wǔ) 5, 31
固/固 (gù) stable; sturdy, 38
國/国 (Guó) country, 42
園/园 (yúan) garden, 48
圓/圆 (yúan) round, 51
在/在 (zài) at, 24
在/在 (zài) at, 48, 51
圭/圭 (guī) (a jade tablet), 38
地/地 (dì) earth, 48, 49
埕/埕 (Chéng) , 35
域/域 (yù) frontier, 40
堅/坚 (jiān) strong and durable, 38
塊/块 (kuài) chunk, 48, 49
塞/塞 (sài) to compete, 39
增/增 (zēng) to increase, 40
士/士 (shì) scholar, 39
夏/夏 (Xià) summer, 36
夏/夏 (xià) summer, 42
外/外 (wài) outside, 23
外婆/外婆 (wài pó) maternal grandmother, 8
夢/梦 (mèng) dream, 42
大/大 (dà) big, 19
天/天 (tiān) sky, 23
天上/天上 (tiān shàng) heaven, 50
太/太 (Tài) very big, 37
失喪/失喪 (shī sàng) lost, 53
奇異/奇异 (qí yì) unusual, 53
奉/奉 (fèng) to receive with respect, 38
奕/奕 (yì) great; grand; abun-dant, 40
奧/奥 (Ào) abstruse, 45
奧/奥 (ào) mysterious; pro-found, 38
奮/奋 (fèn) to rise in force, 38
女/女 (nǚ) woman, 20
她/她 (tā) she, 10
好/好 (hǎo) good, 20, 40
好像/好像 (hǎo xiàng) to seem, 23
如此/如此 (rú cǐ) 'twas, 53

妃/妃 (fēi) concubine, 43
 妍/妍 (yán) beautiful, 42
 妙/妙 (miào) wonderful; intriguing; ingenious, 41
 妮/妮 (nī) maid, 44
 姚/姚 (Yáo) handsome, 36
 姜/姜 (Jiāng) ginger, 35
 姬/姬 (jī) beautiful lady, 40
 威/威 (wēi) dignity; authority; awe, 39
 威/威 (wēi) might, 45
 娟/娟 (juān) graceful, 41
 娥/娥 (é) good; beautiful, 40
 婀/婀 (ē) graceful; elegant, 40
 婉/婉 (wǎn) amiable; pleasant, 41
 媽/媽 (mā) mother, 10
 嬌/嬌 (yān) captivating; fascinating, 41
 嫻/嫻 (xián) refined; gracious, 41
 嬋/嬋 (chán) graceful; lady-like, 40
 嬋娟/嬋娟 (chán juān) lovely, 52
 嬌/嬌 (jiāo) delicate, 40
 孌/孌 (niǎo) delicate; graceful, 41
 子/子 (zǐ) son, 20
 子/子 (zǐ) son, 24
 孔/孔 (Kǒng) hole, 36
 孝/孝 (xiào) dutiful, 43
 孟/孟 (Mèng) eldest child, 36
 孟/孟 (mèng) first month of a season, 43
 季/季 (Jì) season, 37
 孫/孫 (Sūn) grandchild; descendant, 36
 宇/宇 (yǔ) roof, 44
 守/守 (shǒu) to protect, 39
 安/安 (ān) peaceful, 41, 44
 安慰/安慰 (ān wèi) comfort, 53
 宋/宋 (Sòng), 36
 宏/宏 (hóng) magnificent, 38
 宗/宗 (Zōng) ancestor, 58
 宗/宗 (Zōng) ancestor, 37
 官/官 (Gūan) government official, 37
 宛/宛 (Wǎn) crooked, 37
 宜/宜 (Yí) right; fitting, 37
 客/客 (kè) guest, 39
 宣/宣 (Xūan) to announce, 37
 宮闕/宮闕 (gōng quē) imperial palace, 50
 宰/宰 (Zǎi) to preside, 37
 寇/寇 (Kòu) bandits, 37
 富/富 (fù) wealthy, 38
 寒/寒 (hán) cold, 50
 寧/寧 (níng) peace; serenity,

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 寶貴/寶貴 (bǎo guì) precious, 53
 尋回/尋回 (xún huí) found, 53
 小/小 (Xiǎo) little, 44
 小偷/小偷 (xiǎo tōu) thief, 10
 小頭/小頭 (xiǎo tōu) small head, 10
 小鴨/小鴨 (xiǎo yā) duckling, 48
 尤/尤 (Yóu) to feel bitter, 37
 就/就 (jiù) just, 24
 尸/尸 (shī) corpse, 20
 尹/尹 (Yǐn) to govern, 36
 尾/尾 (Wěi) tail, 37
 山/山 (shān) mountain, 19, 20
 山/山 (shān) mountain, 39
 屹/屹 (yì) to rise high, 39
 峽/峽 (xiá) a gorge, 39
 崢嶸/崢嶸 (zhēng) lofty; outstanding, 40
 嵐/嵐 (lán) mountain vapor, 41
 嵩/嵩 (sōng) mountain song, 39
 嶄/嶄 (zhǎn) towering, 40
 嶙/嶙 (lín) rugged, 39
 嶽/嶽 (yuè) a high mountain, 40
 巖/巖 (yán) a rock, 39
 川/川 (chūan) river, 38
 工/工 (gōng) work, 20
 巫/巫 (Wū) witch; wizard, 37
 巫婆/巫婆 (wū pó) witch, 8
 已/已 (yǐ) already, 53
 巾/巾 (jīn) cloth, 20
 常/常 (Cháng) common; normal, 35
 干/干 (gān) shield, 20
 干/干 (gān) to offend, 59
 年/年 (Nián) year, 37
 幸/幸 (xiàng) well-being, 42
 幹/幹 (gàn) tree trunk, 59
 幾時/几时 (jǐ shí) when, 50
 康/康 (Kāng) health, 36
 康/康 (kāng) healthy, 38
 康熙/康熙 (kāng xī) Kangxi, 24
 廕/廕 (yìn) to shelter, 40
 廖/廖 (Liào), 36
 廷/廷 (tíng) monarch's court, 43
 弄/弄 (nòng) make, 51
 弋/弋 (yì) stake, 20
 張/張 (Zhāng) to spread, 36
 形聲/形聲 (xíng shēng) phonetic compound, 19
 彬彬/彬彬 (bīn bīn) Bin-Bin, 23
 彭/彭 (Péng), 36

徐/徐 (Xú) slowly; gently; calmly, 36
 得/得 (dé) obtain, 53
 得/得 (dé) to obtain, 53
 得/得 (de) to the extent of, 23
 德/德 (dé) virtue, 38
 心/心 (xīn) heart, 41, 53
 忠/忠 (zhōng) faithful; devoted, 40
 念/念 (niàn) to miss; to long for, 41
 思/思 (sī) to think, 42
 怡/怡 (yí) harmony; jubilation, 41
 怦/怦 (pēng) eager, 39
 恐/恐 (kǒng) dread, 50
 恨/恨 (hèn) hate, 51
 恩/恩 (ēn) grace; kindness, 41
 恩典/恩典 (ēn diǎn) grace, 53
 恩惠/恩惠 (ēn huì) mercy; grace, 53
 恬/恬 (tián) quiet; undisturbed, 41
 悉/悉 (xī) to know, 39
 悟/悟 (wù) to become aware of; to realize, 39
 悲/悲 (bēi) sadness, 51
 情/情 (qíng) feelings; love, 41
 惟/惟 (wéi) to think; to meditate, 39
 愉/愉 (yú) happy; contented, 42
 愉/愉 (yú) happy; joyful, 41
 愛/愛 (ài) love, 10
 愛/愛 (ài) to love, 40
 感冒/感冒 (gǎn mào) to catch a cold, 23
 慈/慈 (cí) kind; loving, 40
 慎/慎 (shèn) cautious; prudent, 39
 慕/慕 (mù) to long for; to adore, 39
 慧/慧 (huì) wisdom, 44
 慧/慧 (huì) wise, 40
 慷/慷 (kāng) unselfish, 38
 懂/懂 (dǒng) understand, 11
 懂/懂 (dǒng) to understand, 40
 懇/懇 (kěn) sincere, 40
 應有/应有 (yīng yǒu) deserved, 51
 戀/戀 (liàn) to be in love, 41
 戈/戈 (Gē) spear; lance, 36
 成/成 (Chéng) completed; accomplished, 36
 我/我 (wǒ) I, 10, 11
 我/我 (wǒ) I, 50, 53
 我/我 (wǒ) my, 53
 我的/我的 (wǒ de) my, 10
 戰/戰 (Zhàn) war, 37

戴/戴 (Dài) to wear, 35
 戶/戶 (hù) door, 51
 房/房 (Fáng) house, 36
 才/才 (cái) gifted person, 41
 扶/扶 (fú) to support, 38
 把/把 (bǎ), 24
 把/把 (bǎ) handle, 10
 把酒/把酒 (bǎ jiǔ) hold a wine glass, 50
 拔/拔 (bá) to uproot, 10
 拯/拯 (zhěng) to save; to deliver, 40
 拼音/拼音 (pīn yīn) pinyin, 6
 指事/指事 (zhǐ shì) ideograph, 19
 捍/捍 (hàn) to defend, 38
 捷/捷 (jié) swift, 38
 揚/揚 (Yáng) to raise, 36
 援/援 (yuán) to lead; to rescue, 40
 摯/摯 (Zhì) sincere, 37
 據/據 (Jù) proof, 38
 擴/擴 (kuò) to expand, 40
 敢/敢 (gǎn) to dare; bold, 40
 敦/敦 (dūn) honest; to deepen, 38
 敬畏/敬畏 (jìng wèi) to hold in awe, 53
 敲門/敲門 (qiāo mén) to knock at the door, 23
 文/文 (wén) a composition; culture, 42
 斐/斐 (Fěi) elegant; beautiful, 36
 新/新 (xīn) new; fresh, 39
 方/方 (Fāng) square, 35
 於/于 (Yú) in, 38
 施/施 (Shī) to carry out, 36
 旖/旖 (yǐ) romantic; tender, 41
 既/既 (jì) as, 53
 旦/旦 (dàn) daybreak, 40
 旭/旭 (xù) radiance of daybreak, 39
 旺/旺 (wàng) prosperous, 39
 昆/昆 (kūn) elder brother, 39
 昌/昌 (chāng) proper; good, 38
 明/明 (Míng) Míng Dynasty, 58
 明/明 (míng) bright; brilliant, 39
 明/明 (míng) bright, 42, 50
 易/易 (Yì) to exchange, 37
 星/星 (xīng) star, 44
 春/春 (chūn) spring, 40
 昭/昭 (zhāo) clear, 43
 是/是 (shì) is, 50
 是/是 (shì) that, 53
 時/時 (shí) time, 23
 時/時 (shí) time, 53

晉/晉 (jìn) to advance, 38
 晏/晏 (Yàn) clear, 37
 晤/晤 (wù) to meet; enlightened; wise, 39
 晨/晨 (chén) morning; day-break, 38
 景/景 (Jǐng) scenery, 37
 景/景 (jǐng) a view, 44
 晴/晴 (qíng) clear, 51
 晴/晴 (qíng) fine; fair, 41
 智/智 (Zhì) capable; wisdom, 37
 暉/暉 (hūi) radiant, 38
 暢/暢 (chàng) smoothly; fluently, 38
 曇/曇 (tán) clouds, 41
 曉/曉 (xiǎo) daybreak; dawn, 41
 書/書 (shū) book, 57
 曹/曹 (Cáo) (a plural particle), 35
 曼/曼 (màn) delicately beautiful; graceful, 41
 曼/曼 (màn) graceful, 43
 曾/曾 (Zēng) (a 4th generation relationship), 36
 曾/曾 (Zēng) 3 generation difference, 37
 會意/會意 (huì yì) understanding, 19
 月/月 (yùe) moon, 50, 51
 月/月 (yùe) the moon, 41
 有/有 (yǒu) has, 10
 有/有 (yǒu) have, 48–51
 朗/朗 (lǎng) bright, 43
 望/望 (wàng) to watch; to hope, 42
 朝/朝 (zhāo) morning, 40
 木/木 (mù) wood/tree, 20
 木琴/木琴 (mù qín) xylophone, 10
 本/本 (běn) root; source, 41
 朱/朱 (Zhū) bright red, 36
 朱/朱 (zhū) bright red, 51
 朵/朵 (duó) flower, 40
 李/李 (Lǐ) plum tree, 44
 李/李 (Lǐ) plums, 36
 杜/杜 (Dù) to plug, 35
 杞/杞 (qǐ) a species of willow, 39
 杰/杰 (jié) outstanding, 38
 杳/杳 (yǎo) deep and expansive, 39
 枕頭/枕头 (zhěn tóu) pillow, 24
 林/林 (Lín) forest, 36
 林/林 (lín) forest, 20
 柏/柏 (Bó) cypress, 44
 柔/柔 (róu) soft and tender, 41
 查/查 (Zhā), 38

柯/柯 (Kē) tall evergreen tree, 37
 柳/柳 (Liǔ) willow tree, 37
 栗/栗 (Lì) chestnut tree, 37
 格/格 (gé) checks, 10
 桂/桂 (Guì), 37
 梁/梁 (Liáng) bridge, 36
 梁/梁 (liáng) roof beam, 43
 梅/梅 (Méi) prunes, 37
 梧/梧 (wú) a support, 39
 梵/梵 (fàn) clean and pure, 41
 森/森 (sēn) luxuriant vegetation, 39, 44
 森/森 (sēn) trees, 20
 楊/楊 (Yáng) poplar, 37, 43
 楚/楚 (Chǔ), 36
 榮/榮 (róng) glory; honor, 39
 樂/樂 (Yuè) music, 37
 樂/樂 (lè) happy, 42
 樂/樂 (yào) to love, 41
 樊/樊 (Fán) bird cage, 36
 樓/樓 (lóu) building, 50
 櫻/櫻 (yīng) cherry; cherry blossoms, 41
 欣/欣 (xīn) glad, 41
 欣/欣 (xīn) glad; joyful, 41
 欲/欲 (yù) desire, 50
 款/款 (kǎn) sincerity, 40
 歌/歌 (gē) song, 10
 歡/歡 (huān) cheerful, 51
 正/正 (zhèng) proper, 40
 此/此 (cǐ) these, 51
 武/武 (Wǔ) military, 36
 歸去/回去 (guī qù) go back to, 50
 段/段 (Dùan), 42
 段/段 (Dùan) a section, 35
 殷/殷 (yīn) flourishing, 40
 毅/毅 (yì) firm; endurance; fortitude, 40
 母親/母亲 (mǔ qīn) mother, 10
 比賽/比赛 (bǐ sài) competition, 10
 毛/毛 (Máo) hair, 36
 民/民 (mín) the people, 39
 水/水 (Shuǐ) water, 37
 水/水 (shuǐ) water, 19
 江/江 (Jiāng) river, 35
 汪/汪 (Wāng) pool of water, 36
 沈/沈 (Shěn), 36
 沛/沛 (pèi) abundance, 39
 泉/泉 (Quán) spring; fountain, 37
 泓/泓 (hóng) deep, 38
 注音/注音 (zhù yīn) ZhuYin, 6, 58
 泱/泱 (yāng) great; profound, 39

洗/洗 (Xiǎn) , 37
 洪/洪 (Hóng) a flood, 35
 洪/洪 (hóng) flood, 42
 流/流 (liú) to flow; mobile, 39
 涯/涯 (yá) water's edge, 39
 淨/淨 (jìng) pure, 41
 淳/淳 (chún) pure; clean; simple, 40
 添/添 (tiān) to increase, 39
 淼/淼 (miǎo) extensive; vast, 39
 清/清 (qīng) pure; virtuous, 39
 清影/清影 (qīng yǐng) pure shadow, 51
 渡/渡 (dù) to cross, 38
 港/港 (gǎng) a port, 35, 44
 渺/渺 (miǎo) endlessly vast, 39
 湖/湖 (Hú) lake, 38
 湛/湛 (Zhàn) deep; profound, 37
 湯/汤 (Tāng) hot water; soup, 37
 溥/溥 (Pǔ) great; wide; vast, 37
 溪/溪 (xī) mountain stream, 39
 溫/温 (Wēn) warm, 37
 滿/满 (mǎn) full; plentiful, 39
 漢/汉 (Hàn) the Han people, 58
 漢語/汉语 (hàn yǔ) Chinese, 6
 潔/洁 (jié) pure, 40
 潘/潘 (Pān) water, 36
 潤/润 (rùn) moist, 44
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 cháng jiǔ (長久/长久) long time, 52
 cháng xiàng (長向/长向) always, 51
 chén (晨/晨) morning; day-break, 38
 Chén (陳/陈), 44
 Chén (陳/陈) to arrange, 35
 Chén (陳/陈) to lay out, 35, 44
 Chén (陳/陈) to layout, 44
 chéng (乘/乘) ride, 50
 Chéng (埡/埡), 35
 Chéng (成/成) completed; accomplished, 36
 chéng (誠/诚) sincere; honest, 38

Chéng (鄭/郑) , 43
 Chí (遲/迟) late, 36
 chí (馳/驰) to gallop, 44
 Chóu (仇/仇) enemy, 36
 chún (淳/淳) pure; clean; simple, 40
 chāng (昌/昌) proper; good, 38
 chāo (超/超) to exceed, 38
 chū (初/初) first, 53
 chūan (川/川) river, 38
 chūn (春/春) spring, 40
 chàng (暢/暢) smoothly; fluently, 38
 chù (矗/矗) steep; lofty, 38
 chù (處/处) place, 50
 Chǔ (楚/楚) , 36
 chuán (船/船) boat, 20

dāng (噹/当) (onomatopoeia), 21
 dāo (刀/刀) knife, 19
 dēng (燈/灯) lamp; lantern, 38
 dēng (登/登) to ascend; to climb, 38
 dīng (丁/丁) nail, 19
 dīng (叮/叮) to sting, 21
 dōng (咚/咚) (onomatopoeia), 21
 dū (嘟/嘟) (onomatopoeia), 21
 dòng (懂/懂) understand, 11
 dà (大/大) big, 19
 dù zi (肚子/肚子) stomach, 23
 dá (達/达) intelligent; understanding, 38
 dé (得/得) obtain, 53
 dé (得/得) to obtain, 53
 dé (德/德) virtue, 38
 Dí (狄/狄) , 36
 dí (迪/迪) to progress, 38
 dúo (朵/朵) flower, 40
 Dúo (鐸/铎) a large bell, 36
 dī (低/低) hang down, 51
 dōu (都/都) all, 48
 Dū (督/督) to oversee, 36
 dūn (敦/敦) honest; to deepen, 38
 Dài (戴/戴) to wear, 35
 dài (黛/黛) a beauty, 40
 dàn (旦/旦) daybreak, 40
 dàn yuàn (但願/但愿) if only, 52
 dào (道/道) road, 42
 dào (道/道) road; path, 38
 dào chù (到處/到处) everywhere, 48
 Dèng (鄧/邓) , 35, 44
 dì (地/地) earth, 48, 49
 dòu (鬥/斗) to struggle, 38

Dù (杜/杜) to plug, 35
 dù (渡/渡) to cross, 38
 Duàn (段/段) , 42
 Duàn (段/段) a section, 35
 Dǐ (邸/邸) residence of a high official, 37
 dòng (懂/懂) to understand, 40
 Dǒng (董/董) to oversee, 35
 de (得/得) to the extent of, 23
 de (的/的) 's, 23
 de (的/的) ('s), 23
 Dīng (丁/丁) , 35
 dǐng (頂/顶) the top, 38

eñ (恩/恩) grace; kindness, 41
 eñ diǎn (恩典/恩典) grace, 53
 eñ huí (恩惠/恩惠) mercy; grace, 53
 èr (二/二) 2, 31, 32

fán (凡/凡) all, 20
 fú hào (符號/符号) symbol, 6
 fāng (匚/匚) , 20
 fèi (妃/妃) concubine, 43
 fèi (緋/绯) scarlet; crimson, 41
 fèi (菲/菲) fragrant, 40
 fèi (霏/霏) falling of snow and rain, 41
 fēi (飛/飞) to fly, 41
 fēn (芬/芬) fragrance; perfume, 40
 fēng (丰/丰) good-looking, 41
 fēng (豐/丰) abundant, 38
 fēng (鋒/鋒) cutting edge of a sword, 43
 fēng (風/风) wind; breeze, 41
 fēng zhēng (風箏/风筝) kite, 7
 Fán (樊/樊) bird cage, 36
 Fáng (房/房) house, 36
 Féng (馮/冯) , 35, 36, 42
 fú (扶/扶) to support, 38
 fú (福/福) good fortune; a blessing, 38
 Fāng (方/方) square, 35
 fāng (芳/芳) fragrant; virtuous, 40
 fēng (風/风) wind, 50
 fàn (梵/梵) clean and pure, 41
 Fàn (范/范) , 43
 Fàn (范/范) bee, 35
 Fèi (費/费) expenditure, 36
 fèn (奮/奋) to rise in force, 38
 fèng (奉/奉) to receive with respect, 38
 fèng (鳳/凤) male phoenix, 40

Fù (傅/傅) a teacher, 35
 fù (富/富) wealthy, 38
 fù (馥/馥) fragrant fragrance, 40
 Fěi (斐/斐) elegant; beautiful, 36
 fěi (翡/翡) kingfisher; emerald, 41
 fǔ (頤/頤) to bow the head, 43
 gé (咯/咯) a click, 21
 gā (嘎/嘎) (onomatopoeia), 21
 gān (乾/干) dry, 59
 gān (干/干) shield, 20
 gān (干/干) to offend, 59
 Gē (戈/戈) spear; lance, 36
 gē (歌/歌) song, 10
 gōng (工/工) work, 20
 gōng jī (公雞/公鸡) rooster, 23
 gū (咕/咕) to murmur, 21, 23
 gū lū (咕嚕/咕嚕) "gurggle/hyperpage, 23
 gūa (呱/呱) (onomatopoeia), 22
 gǎn (敢/敢) to dare; bold, 40
 gǎn (趕/赶) to pursue, 40
 gǎn mào (感冒/感冒) to catch a cold, 23
 gǎng (港/港) a port, 35, 44
 gàn (幹/干) tree trunk, 59
 gé (格/格) checks, 10
 gé (閣/阁) pavillion, 51
 Guó (國/国) country, 42
 Gān (甘/甘) delicious, 36
 gān tián (甘甜/甘甜) sweet, 53
 gāo (高/高) high, 50
 Gāo (高/高) high; tall, 35
 gōng (功/功) merit; achievement, 38
 Gōng (龔/龚) reverential, 35
 gōng quē (宮闕/宫阙) imperial palace, 50
 Gū (辜/辜) sin; crime, 37
 gū gū (呱呱/呱呱) baby's cry, 48
 Gūan (官/官) government official, 37
 guī (傀/傀) great; wonderful, 38
 guī (圭/圭) (a jade tablet), 38
 guī (瑰/瑰) fabulous; a kind of jasper, 40
 guī qù (歸去/归去) go back to, 50
 Gūo (郭/郭) town, 35
 gè (各/各) each, 10
 gòng (共/共) share, 52
 gù (固/固) stable; sturdy, 38
 Gù (顧/顾) to turn around and

look, 35

Gù (桂/桂) , 37

gù (貴/贵) high-placed, 38

gù (貴/贵) valued, 43

guò (過/过) to pass, 38

gě (舸/舸) barge, 10

Gě (葛/葛) , 37

Gǔ (古/古) ancient, 37

gǔ (古/古) ancient, 51

gǔ (谷/谷) valley, 38

Gǎn (管/管) tube; pipe, 37

ge (個/个) (quantifier), 10

hā (哈/哈) to breathe on, 22

hā jiū (哈啾/哈啾) achoo, 23

hāi (嗨/嗨) “hi”, 22

hū (呼/呼) to exhale, 22, 24

hūa (嘩/哗) (onomatopoeia), 22

hǎo (好/好) good, 20, 40

Hǎo (郝/郝) (an ancient place), 35

hǎo xiàng (好像/好像) to seem, 23

hǒu (吼/吼) to roar, 22

Hàn (漢/汉) the Han people, 58

hàn yǔ (漢語/汉语) Chinese, 6

huì yì (會意/会意) understanding, 19

huò (噯/噯) (onomatopoeia), 22

hán (寒/寒) cold, 50

Hán (韓/韩) fence, 35

háo (豪/豪) outstandingly intelligent, 38

Hé (何/何) , 35

hé (合/合) together, 51

hé (和/和) harmony, 38

hé děng (何等/何等) how, 53

hé nián (何年/何年) what year, 50

hé sì (何似/何似) similar to, 51

hé shì (何事/何事) why, 51

hóng (宏/宏) magnificent, 38

hóng (泓/泓) deep, 38

Hóng (洪/洪) a flood, 35

hóng (洪/洪) flood, 42

hóng (鴻/鸿) swan, 38

Hóu (侯/侯) marquis, 35

Hú (湖/湖) lake, 38

Hú (胡/胡) to blunder, 35

Huáng (黃/黄) yellow, 35

Hua (花/花) flower, 37

huan (歡/欢) cheerful, 51

hūi (暉/晖) radiant, 38

hàn (捍/捍) to defend, 38

hào (皓/皓) white and bright, 38

Hè (賀/贺) to congratulate,

35

hèn (恨/恨) hate, 51

hù (戶/户) door, 51

huàn (煥/煥) shining, 38

hùi (慧/慧) wisdom, 44

hùi (慧/慧) wise, 40

hùi (蕙/蕙) fragrant orchid, 40

hùi (薈/荟) luxuriant growth, 40

hǔ (虎/虎) brave, 38

huǒ (火/火) fire, 38

huáng (黃/黄) yellow, 23

jī (几/几) stool, 20

jī (几/几) small table, 19

jī (唧/唧) pump, 22

jī (噤/叽) to talk indistinctly, 22

jīn (巾/巾) cloth, 20

jīn tiān (今天/今天) today, 10

jī (姬/姬) beautiful lady, 40

Jīn (金/金) gold, 36

jiān (娟/娟) graceful, 41

jūn (君/君) monarch, 43, 44

Jì (季/季) season, 37

jì (既/既) as, 53

jì (繼/继) to carry on, 38

jìn (晉/晋) to advance, 38

jìn (進/进) to advance, 38

Jù (據/据) proof, 38

jiǔ (九/九) 9, 31–33

jǐ shí (幾時/几时) when, 50

jǐn (錦/锦) glorious, 42

jiē (結/结) tough, 38

jiū (啾/啾) chirping sound, 22

jiǎ (賈/贾) (“gǔ=merchant”), 35

jiǎn (簡/简) brief, 37

jiǎng (蔣/蒋) , 36, 43

jiǎo (佼/佼) charming, 38

jiè jià (假借/假借) to make use of, 19

jiàn (見/见) to see, 19, 20, 59

jiào (叫/叫) to call, 23

jiù (就/就) just, 24

jié (傑/杰) remarkable, 38

jié (捷/捷) swift, 38

jié (杰/杰) outstanding, 38

jié (潔/洁) pure, 40

jiā (佳/佳) beautiful, 40

jiā (佳/佳) excellent, 41

jiān (堅/坚) strong and durable, 38

jiān (肩/肩) to sustain, 40

jiāng (姜/姜) ginger, 35

jiāng (江/江) river, 35

jiāo (嬌/娇) delicate, 40

jiāo (焦/焦) scorched, 37

jīn (今/今) now, 53

jīn (禁/禁) to endure, 40

jīn xī (今夕/今夕) today, 50

jiǐng (菁/菁) the flower of the leek, 40

jià (駕/驾) to excel, 40

jiàn (澗/涧) mountain stream, 40

jiàng (匠/匠) craftsman, 40

jiè (介/介) upright, 38

jièn (勁/劲) vigor, 38

jìng (勁/劲) powerful, 40

jìng (淨/净) pure, 41

jìng (靖/靖) peaceful, 38

jìng (靜/静) tranquility, 41

jìng wèi (敬畏/敬畏) to hold in awe, 53

jiǐng (井/井) a well, 38

jiǐng (景/景) a view, 44

Jǐng (景/景) scenery, 37

jiǒng (炯/炯) brightness, 38

kāng xī (康熙/康熙) Kangxi, 24

Kē (柯/柯) tall evergreen tree, 37

kū (哭/哭) to cry, 20

kǎi (凱/凯) peace, 38

kǎi (凱/凯) triumphant strains, 42

kǒu (口/口) mouth, 20

kàn dào (看到/看到) see, 10

kào (靠/靠) to lean, 24

kòu (叩/叩) to knock, 22, 23

Kāng (康/康) health, 36

kāng (康/康) healthy, 38

kāng (慷/慷) unselfish, 38

kūn (昆/昆) elder brother, 39

kàn jiàn (看見/看见) to see, 53

kè (克/克) to overcome, 39

kè (剋/克) to overcome, 40

kè (客/客) guest, 39

Kòu (寇/寇) bandits, 37

kùo (擴/扩) to expand, 40

kùo (闊/阔) wealthy, 40

Kě (可/可) to be able to, 38

kěn (懇/恳) sincere, 40

Kǒng (孔/孔) hole, 36

kǒng (恐/恐) dread, 50

kǔan (款/款) sincerity, 40

Kuāng (匡/匡) to correct, 37

kuài (塊/块) chunk, 48, 49

lín (林/林) forest, 20

lū (嚕/噜) verbose, 22, 24

lūo (囉/啰) to chatter, 22

lǎng (朗/朗) bright, 43

lì (力/力) force, 19

Lái tè (萊特/莱特) Wright, 45

lán (嵐/岚) mountain vapor, 41

lán (蘭/兰) orchid, 41

láng (琅/琅) clean and white, 39



láng (瑯/瑯) pure and white, 39
 Léi (雷/雷) thunder, 36
 lí (離/离) apart, 51
 Lí (黎/黎) many, 42
 Lí (黎/黎) numerous, 37
 líng (零/零) 0, 31
 lóng (隆/隆) prosperous; abundant, 39
 Lóng (龍/龙) dragon, 36
 lóng (龍/龙) dragon, 44
 lóu (樓/楼) building, 50
 Lú (盧/卢) black, 36
 Lúo (羅/罗) thin light silk, 36
 Lài (賴/赖) to rely on, 36
 lè (樂/乐) happy, 42
 lì (力/力) strength, 39
 Lì (栗/栗) chestnut tree, 37
 lì (莉/莉) white jasmine, 41
 lì (麗/丽) beautiful, 41, 44
 Lù (路/路) road, 37
 Lù (陸/陆) land, 36, 37
 liú (五/五) 6, 32
 liú (六/六) 6, 31–33
 lǎo (老/老) old, 48, 49
 Lǐ (李/李) plum tree, 44
 Lǐ (李/李) plums, 36
 lǐ (理/理) reason; logic, 39
 lǐ (禮/礼) courtesy, 39
 lǐ (裡/里) inside, 48
 Lǚ (魯/鲁) dull, 37
 Lǚ (呂/吕), 36
 la (啦/啦) (onomatopoeia), 22
 le (了/了) (change of state), 23, 24
 liǎng (倆/俩) craft; ability, 40
 liàng (亮/亮) bright, 23
 lián (蓮/莲) lotus, 41
 Lián (連/连) to connect, 37
 Liáng (梁/梁) bridge, 36
 liáng (梁/梁) roof beam, 43
 liáng (良/良) fine; desirable, 39
 lín (嶙/嶙) rugged, 39
 Lín (林/林) forest, 36
 lín (琳/琳) beautiful jade, 44
 lín (磷/磷) water flowing between stones, 39
 Lín (臨/临) to look down from above, 38
 lín (霖/霖) continuous heavy rain, 39
 líng (玲/玲) tinklings of jade, 41
 líng (綾/綾) very fine silk cloth, 41
 Liú (劉/刘) to kill, 36
 liú (流/流) to flow; mobile, 39
 liú (瀏/浏) the appearance of a clear stream, 40

liàn (戀/恋) to be in love, 41
 liàng (亮/亮) bright, 39
 liàng (諒/谅) honest, 39
 Liào (廖/廖), 36
 liè (烈/烈) fiery, 39
 lìng (令/令) excellent, 39
 liǎng (二/二) 2, 33
 Liǔ (柳/柳) willow tree, 37
 má (麻/麻) numbness, 10
 mén (門/门) door, 23
 Míng (明/明) Míng Dynasty, 58
 móu (啍/啍) (onomatopoeia), 22
 mā (媽/妈) mother, 10
 Mǎ (馬/马) horse, 36
 mǎn (滿/满) full; plentiful, 39
 mà (罵/骂) to scold, 10
 mù (木/木) wood/tree, 20
 mù qín (木琴/木琴) xylophone, 10
 máng (茫/茫) vast; boundless, 39
 Máo (毛/毛) hair, 36
 Máo (茅/茅) couch grass, 38
 Méi (梅/梅) prunes, 37
 méi (玫/玫) rose, 41
 Méi (眉/眉) eyebrows, 37
 Mén (門/门) door, 37
 méng (萌/萌) to bud; to shoot forth, 39
 méng (蒙/蒙) to receive, 53
 mài (邁/迈) to surpass, 39
 Mài (麥/麦) wheat; barley; oats, 37
 màn (曼/曼) delicately beautiful; graceful, 41
 màn (曼/曼) graceful, 43
 mào (茂/茂) exuberant, 39
 mèng (夢/梦) dream, 42
 Mèng (孟/孟) eldest child, 36
 mèng (孟/孟) first month of a season, 43
 mì (蜜/蜜) honey, 41
 Mò (莫/莫) not, 37
 mù (慕/慕) to long for; to adore, 39
 mù (牧/牧) to shepherd, 39
 mù (睦/睦) friendly; to befriend, 39
 Mù (穆/穆) peaceful; serene, 37
 měi (美/美) beautiful, 41
 Měng (猛/猛) bold; fierce, 38
 ma (麼/么) (for questions), 10
 miāo (喵/喵) "meow|hyperpage, 22
 miē (咩/咩) (onomatopoeia), 22
 miǎo (淼/淼) extensive; vast, 39

miǎo (渺/渺) endlessly vast, 39
 mián (眠/眠) sleep, 51
 Miáo (苗/苗) a sprout, 37
 míng (明/明) bright; brilliant, 39
 mǐn (民/民) the people, 39
 míng (明/明) bright, 42, 50
 miào (妙/妙) wonderful; intriguing; ingenious, 41
 mǎ (馬/马) horse, 10
 mǔ qīn (母親/母亲) mother, 10
 nǚ (女/女) woman, 20
 nǐ de (你的/你的) your, 11
 Nán (南/南) south, 37
 nán (難/难) difficult, 51
 ní (妮/妮) maid, 44
 Nà (納/纳) to receive, 37
 nà lǐ (那裡/那里) there, 48
 nài (耐/耐) to endure, 39
 nòng (弄/弄) make, 51
 niú (牛/牛) cow, 23
 niǎo (孃/孃) delicate; graceful, 41
 Nián (年/年) year, 37
 níng (寧/宁) peace; serenity, 41
 Niú (牛/牛) ox, 36
 niàn (念/念) to miss; to long for, 41
 Niè (聶/聂), 37
 pā (啪/啪) (onomatopoeia), 22
 pēng (怦/怦) eager, 39
 pēng (砰/砰) (onomatopoeia), 22
 pīn yīn (拼音/拼音) pinyin, 6
 pīng (乒/乒) (onomatopoeia), 22
 pū (撲/撲) (onomatopoeia), 22
 Péi (裴/裴) the look of a flowing gown, 37
 Péng (彭/彭), 36
 Pí (皮/皮) skin; fur, 37
 Pān (潘/潘) water, 36
 pèi (沛/沛) abundance, 39
 Pǔ (溥/溥) great; wide; vast, 37
 qù (去/去) to go, 20
 qí (祈/祈) to pray, 39
 qí (祺/祺) lucky, 42
 Qí (齊/齐) equal, 37
 Qí (齊/齐) orderly, 43
 qí yì (奇異/奇异) unusual, 53
 quán (全/全) completely, 51

Quán (泉/泉) spring; fountain, 37
 quē (缺/缺) deficient, 51
 qī (七/七) 7, 31–33
 qī (六/六) 7, 32
 qǐ (杞/杞) a species of willow, 39
 qǐ (綺/綺) beautiful, 51
 qǐ (綺/綺) beautiful; resplendent, 41
 qǐ wǔ (起舞/起舞) rise and dance, 51
 qiāo mén (敲門/敲门) to knock at the door, 23
 qián (前/前) before, 53
 Qián (錢/钱) money, 36
 qín (勤/勤) diligent; industrious, 39
 Qín (秦/秦) Qin Dynasty, 36
 qíng (情/情) feelings; love, 41
 qíng (晴/晴) clear, 51
 qíng (晴/晴) fine; fair, 41
 qióng (瓊/琼) fine jade, 41
 qióng (瓊/琼) jade, 50
 qiú (遒/遒) strong; vigorous, 39
 qiān (千/千) 1000, 33, 34
 qiān (謙/谦) humble, 39
 qiān lǐ (千里/千里) long distance, 52
 qīng (清/清) pure; virtuous, 39
 qīng (青/青) blue, 43
 qīng tiān (青天/青天) blue sky, 50
 qīng yǐng (清影/清影) pure shadow, 51
 qiū (秋/秋) autumn, 43
 Qiū (邱/邱) hill, 36
 rén (人/人) person, 19
 rén (儿/儿) person, 19
 rù (入/入) to enter, 19
 ráo (饒/饶) abundant, 39
 rén (人/人) people, 51, 52
 rén (仁/仁) benevolence; kindness, 39
 Rén (任/任), 36
 rén jiān (人間/人间) world of man, 51
 róng (榮/荣) glory; honor, 39
 róng (融/融) glowing, 39
 róu (柔/柔) soft and tender, 41
 rú cǐ (如此/如此) 'twas, 53
 rùi (瑞/瑞) auspicious, 42
 rùi (瑞/瑞) lucky, 42
 rùi (睿/睿) wise and clever, 39
 rùn (潤/润) moist, 44
 Rǔan (阮/阮) (ancient musical instrument), 37

sēn (森/森) luxuriant vegetation, 39, 44
 sēn (森/森) trees, 20
 sī (嘶/嘶) (onomatopoeia), 22
 shí (十/十) 10, 31, 32
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 crooked 宛/宛 (Wǎn), 37
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 fence 韓/韓 (Hán), 35
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 fine jade 瓊/瓊 (qióng), 41
 fine; desirable 良/良 (liáng), 39
 fine; fair 晴/晴 (qíng), 41
 fire 火/火 (huǒ), 38
 firm; endurance; fortitude 毅/毅 (yì), 40
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 friendship 誼/誼 (yì), 42
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 glory; honor 榮/榮 (róng), 39
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 go back to 歸去/歸去 (guī qù), 50
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 good fortune; a blessing 福/福 (fú), 38
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 good; beautiful 娥/娥 (é), 40
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 graceful 曼/曼 (màn), 43
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 graceful; ladylike 嬋/嬋 (chán), 40
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 high 高/高 (gāo), 50
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 high; tall 高/高 (Gāo), 35
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 honest 諒/谅 (liàng), 39
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