

Applying Mobile-Assisted Language Technology to Transform Arabic Pedagogy

by

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Panel Session:

Exploiting Mobile Technology and Computational
Lexicography to Enhance Arabic Pedagogy

2014 MESA Annual Meeting • Washington, DC

Background

- Arabic pedagogy and lexicography steeped in tradition
- Time to "join the 21st century", the mobile learning revolution
- Smart mobile devices significantly enhance language learning.
- Cutting edge mobile apps help master Arabic effectively

The CJKI Arabic Learner's Dictionary (CALD)

القاموس العربي الإنجليزي للمتعلمين

Chief Editor: Jack Halpern

The CJKI Arabic Learner's Dictionary (CALD)

أَكَلَ 'á-ka-la

VT+VI [أ-ك-ل]

eat

لَمْ يَأْكُلْ شَيْئًا مُنْذُ صَبَاحِ الْيَوْمِ. *lam yá'kul sháy'an múndhu ṣabáhi_l'yáwmi.* He has not eaten anything since this morning.

| | |
|---------------------|------------------------|
| Form I - Z1 - 123 | AP أَكَلَ 'ákil-un |
| PR يَأْكُلُ yá'kulu | PP مَأْكُولٌ ma'kúl-un |
| IM كَلَّ kul | VN أَكَلَّ 'ákl-un |

الشَّرْقُ الْأَوْسَطُ 'ash-shár-qu_l-'áw-sa-ṭ-u

PROPER NOUN m. the Middle East

أَلْيَابَانُ 'alyabánu → يَابَانُ yabánu

مِنْ min

PREP

① from; of

أَتَيْتُ مِنَ الْقَاهِرَةِ. *'atáytu mína_lqāhíratí.*
I came from Cairo.

④ (made) of; composed of

صَنَعْتُ كُرْسِيًّا مِنَ الْخَشَبِ. *ṣanáetu kursíyyan mína_lkháshabí.* I made a wooden chair.

⑤ with, because (of)

تَجَمَّدَتْ أَصَابِعِي مِنَ الْبُرْدِ. *tajámmadat 'aṣábiej mína_lbárdí.* My fingers were frozen with cold.

بَيْتٌ báy-t-un

NOUN m. [ب-ي-ت]

① house, home, residence MP1

أَسْكُنُ فِي بَيْتٍ صَغِيرٍ. *'áskunu fí báytin ṣaghírin.* I live in a small house.

② home MP1

رَجَعَ إِلَى بَيْتِهِ. *rájæa 'íla báytihi.* He returned home.

③ verse MP2

قَرَأْنَا بَيْتَ الشَّعْرِ بِصَوْتٍ عَالٍ. *qará'na báyta_shsháeri biṣáwtin éálin.* We read a verse of poetry out loud.

Features – Headword Selection and Grammatical Information

- Clear and concise word meanings
- Carefully selected headwords and meanings
- Up-to-date entries
- Prepositions are given explicitly for each sense of intransitive verbs
- Word stress and neutralized vowels indicated
- Part of speech labels for every sense
- Detailed grammatical information in Grammar Box

Features – User-friendliness

- Targeted specifically at beginner to intermediate learners
- Fully illustrated by example sentences
- Alphabetical ordering
- Cross-references for common spelling variants
- All words and examples fully romanized
- Subentries with useful phrases and fixed expressions
- User-friendly design
- Superb user interface
- Mobile app for smartphones and tablets

Main Entry–Noun

بَيْتٌ *báy·t-un*

NOUN m. [ب-ي-ت]

① **house, home, residence** MP1

أَسْكُنُ فِي بَيْتٍ صَغِيرٍ. *'áskunu fī báytin ṣaghírin.* I live in a small house.

② **home** MP1

رَجَعَ إِلَى بَيْتِهِ. *rájaea 'ila báytihi.* He returned home.

③ **verse** MP2

قَرَأْنَا بَيْتَ الشَّعْرِ بِصَوْتٍ عَالٍ. *qará'nā báyta shsháeri biṣáwtin éálin.* We read a verse of poetry out loud.

MS بَيْتٌ *báy·t-un*

MP1 بُيُوتٌ *buyút-un*

FS —

MP2 أَبْيَاتٌ *'abyát-un*

Main Entry – Verb

عَادَ *εá·da*

vi [ع-و-د]

① **return, go back (إِلَى to)**

عَادَ إِلَى بِلَادِهِ. *εáda 'íla biládihi*. He returned to his country.

② **repeat, do again**

عَادَ الرَّجُلُ لِلتَّدْخِينِ ثَانِيَةً. *εáda_rrájulu littadkhíni thānīyatan*. The man took up smoking again.

③ **bring, take back (بِ back)**

عُدْتُ بِكُلِّ كُتُبِي إِلَى بَيْتِي بَعْدَ إِكْمَالِ
دِرَاسَتِي فِي الْخَارِجِ. *εúdtu bikúlli kútubī
'íla báytī báeda 'ikmáli dirásatī fi_lkhárijī*. I
took all my books back home after com-
pleting my studies abroad.

Subentries

Includes prepositional phrases, fixed expressions, and noun-derived adverbs highly useful to learners.

SUB

لَمْ يَعْذُ *lam yáεud*

PHRASE [followed by an adjective or imperfect indicative verb] **no longer, not anymore**

لَمْ أَعُدُّ أُصَدِّقُكَ. *lam 'áεud 'uṣaddíquka.* I don't believe you anymore.

لَمْ يَعْذُ يَزُورُ هَذَا الْمَكَانَ. *lam yáεud yazúru hádhā_Imakāna.* He no longer visits this place.

Grammar Box

Includes regular and irregular inflected forms for imperfect (*PR*), imperative (*IM*), active (*AP*) and passive (*PP*) participles, verbal nouns(s) (*VN*), feminine form, sound and broken plurals, and more.

| | |
|---|-------------------------------------|
| Form I - H1 - 120 | <i>AP</i> عَائِدٌ <i>εá'id-un</i> |
| <i>PR</i> يَعُودُ <i>yaεúdu^{w/u}</i> | <i>PP</i> مَعُودٌ <i>maεúd-un</i> |
| <i>IM</i> عُدْ <i>εud</i> | <i>VN</i> عَوْدَةٌ <i>εáwdat-un</i> |

Illustrative Examples

- Examples quoted from corpora, often too difficult for learners, have been avoided
- Example sentences written expressly to be useful to learners

عَادَ *εā·da*

VI [ع-و-د]

① **return, go back (إِلَى to)**

عَادَ إِلَى بِلَادِهِ. *εāda 'ila bilādihi.* He returned to his country.

② **repeat, do again**

عَادَ الرَّجُلُ لِلتَّدخينِ ثَانِيَةً. *εāda_rrájulu littadkhíni thānáyatan.* The man took up smoking again.

CJKI Arabic Romanization System (CARS)

- Specifically designed for learners
- Unambiguously represents Arabic phonemes
- Accurately indicates word stress or accentuation
- Explicitly indicates which long vowels are neutralized
(shortened)

Sample of CARS Romanization

Vocalized Arabic

مُنْدُ مِئَاتِ الْمَسْكِينِ أَنْيَشْتَعِ فِي الصِّدِّ أَرْمَلَةٌ فَقِيرَةٌ مَعَ ابْنِهَا الصَّغِيرِ
لَا عَاءَ إِلْدِكِينَ لِأَنَّ عَاءَ الدِّينِ يَبْلُغُ مِنَ الْعُمْرِ اثْنَيْ عَشَرَ قَامًا فَطُ، وَلَكِنَّهُ
كَأَلَى يَعْمُ فِي مَحَا خِيَّاطٍ لِيَكْتَسِبَ يَهْتَلِيَعُ مِنْهُ هُوَ وَأُمَّهُ.

CARS

múndhu mi'āti ssinína, kánat taéishu fi ššíni 'armálatun faqíratun
máea bnihā ššaghíri ealá'i ddíni. kána ealá'u ddíni yáblughu
mína leúmri 'ithnáy éáshara eáman fáqaṭ, walakínnahu kána
yáemalu fi maḥállí khayyáṭin liyaktásiba ma yaéishu mínhu
húwa wa'úmmahu.

Part of Speech

- Explicit part of speech labels for every sense
- Verb transitivity labels for each sense

أَكَلَّ *ʾá·ka·la*

VT+VI [أ-ك-ل]

eat

لَكِنْ *lá·kin*

CONJ

but, however

بَيْتٍ *báy·t-un*

NOUN *m.* [ب-ي-ت]

① **house, home, residence** *MP1*

Multiword Expressions and Cross References

- Numerous useful multiword expressions and compound nouns
- Cross references for spelling variants speed up lookup

الْشَّرْقُ الْأَوْسَطُ *ʿash·shár·qu_l·ʿáw·sa·ṭ-u*

PROPER NOUN *m.* the Middle East

وَلَكِنْ *walákin* → لَكِنْ *lákin*

وَلَكِنَّ *walakinna* → لَكِنْ *lákin*

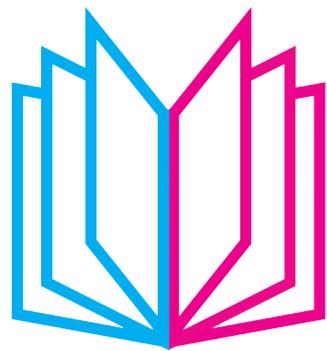
Traditional Headword Selection

- Quran and classical sources
- Copying from past dictionaries
- Analyzing authentic texts found in corpora
- Subjective judgment of the lexicographer
- "Importance" based on frequency and lexicographer's discretion

Pedagogical Headword Selection

- Based on analysis of corpora and modern pedagogical sources
- Includes many modern words such as 'blog' and 'ATM'
- Rare, archaic and dialectical words omitted
- Headwords and senses selected by lexicographers and educators to maximize relevance to learners
- Multiword expressions systematically included
- Word senses listed in order of importance based on modern usage
- Important derived words, especially adverbs, systematically included

Learner's Interactive Bitext Electronic Reading Application



Libera

Libera: Arabic for English Speakers

☰ Chapter 1 Sentence 6 ▾

▷ + آع

One day, when Ali Baba was returning to town **riding on** his donkey, it happened that he saw in the distance a cloud of dust filling the sky, obscuring everything.

وحدث ذات يوم، بينما كان علي بابا راجعا **يركب** حماره إلى المدينة، أن رأى من بعيد غبارا يملأ الجو، ويحجب الأشياء.

And he realized that the dust cloud was coming closer to him, heading for the place where he was standing.

ولاحظ أن الغبار يقترب منه ويتقدم نحو المكان الذي كان يقف فيه.

Then, in the midst of the dust cloud, he was able to distinguish men riding horses

ثم أمكنه أن يتبين بين الغبار رجالا يركبون خيلا، ويغنون بأصوات



riding on

yárkabu

يَرْكَبُ



Comprehensible Input

According to renowned linguist Stephen Krashen:

- Free voluntary reading is “the most powerful tool we have in language education”
- Learners rapidly absorb grammar and vocabulary when exposed to *comprehensible* material
- For maximum effectiveness, reading should be interesting and enjoyable

Interactive Parallel Text (IPT)

- Allows learners to read vast amounts of L2 texts with little effort
- New multimedia medium for accessing *comprehensible* L2 texts
- Libera, the first IPT application, is a cutting edge platform that allows learners to read effortlessly and enjoyably
- Texts precisely linked on *segment* (word or phrase) level
- Tapping *interactive link* highlights L2 segment and activates glosses, grammar notes, audio, and transcriptions

Libera - Features

- Innovative multi-panel interface
- Interactive links
- Customized dictionary
- Segment bar
- Word Info screen
- Favorite word list
- Full-form search
- Grammar notes
- Verb conjugator
- Word structure
- Full audio recordings

Four-panel Sentence Mode

Texts are precisely linked at *segment* (word or phrase) level. Tapping a segment in any one text simultaneously highlights the linked segment in all other texts.

☰ Chapter 1 Sentence 5 ▾ ▶ + āع

| | |
|--|--|
| <p>Ali Baba earned what he needed for a living by selling firewood, which he collected in a faraway forest, and brought it back on his donkey to sell in the town's market.</p> | <p>فَكَانَ عَلِيٌّ أَبَا يَكْسِبُ مَا يَحْتَاجُ إِلَيْهِ مِنَ الْقُوتِ بِبَيْعِ الْحَطَبِ الَّذِي يَجْمَعُهُ فِي غَابَةِ بَعِيدَةٍ وَيَعُودُ بِهِ عَلَى حِمَارِهِ لِيَبِيعَهُ فِي سُوقِ الْمَدِينَةِ</p> |
| <p>جَمَعَ <i>jāmaʿa</i> verb 1. gather, collect 2. combine, join add (in math)</p> | <p>fakāna ʿalī bāba yaksibu ma yaḥtāju ʾilāyhi mina l-qūt bibáyeyi l-ḥáṭabi l-ladhi yajmáeuhu fī ghābatin baʿīdatin wayaeúdu bíhi ʿála ḥimárihi liyabíeahu fī súqi l-madīnati.</p> |

W Word Info

← he collected yajmáeuhu يَجْمَعُهُ →

Idiomatic English

Vocalized Arabic

Romanized Arabic

Customized Dictionary

Segment Bar

Word Info Screen

- Dictionary entry with full example sentences for each word
- Ideal for concentrated vocabulary study

Chapter 1 Sentence 5

Words Favorites

Selected words

W jámæa جَمَعَ

All words

W `a أَ

W `ábšara أَبْصَرَ

W `ábun أَبٌ

W `ábyaḏu أَبْيَضُ

W `adátun أَدَاةٌ

W `ádkhala أَدْخَلَ

1. W `ádraka أَدْرَكَ

2. W `aeádda أَعَدَّ

3. W `aeáda أَعَادَ

W `aeára أَعَارَ

W `aeḷa أَعْلَى

W `ætaqa أَعْتَقَ

Word info Close

جَمَعَ jámæa verb

1. gather, collect
2. combine, join
3. add (in math)

فبدأ **يجمع** من الجواهر ما يستطيع حماره أن يحمله.

fabáda'a yájmæu mína_ljawáhiri ma yastaḏíeu ḥimáruhu `an yaḥmílahu.
So he began **to gather up** as many jewels as his donkey was able to bear.

ووضع ما **جمعه** في الأكياس وحملها على الحمار مسرعا لأنه شعر بالوقت يمر سريعا وخاف أن يرجع للصوص إلى الكهف ويقتلوه.

wawáḏæa ma jamáæahu fi_l`akyási waḥammálahæ eála_lḥimári músriean li`annahu shæara bilwáqti yamúrru saríean wakháfa `an váriæa llusúsu `íla lkábfí wawaqtulúhu

he collected yajmæuhu يَجْمَعُهُ

Full-form Search

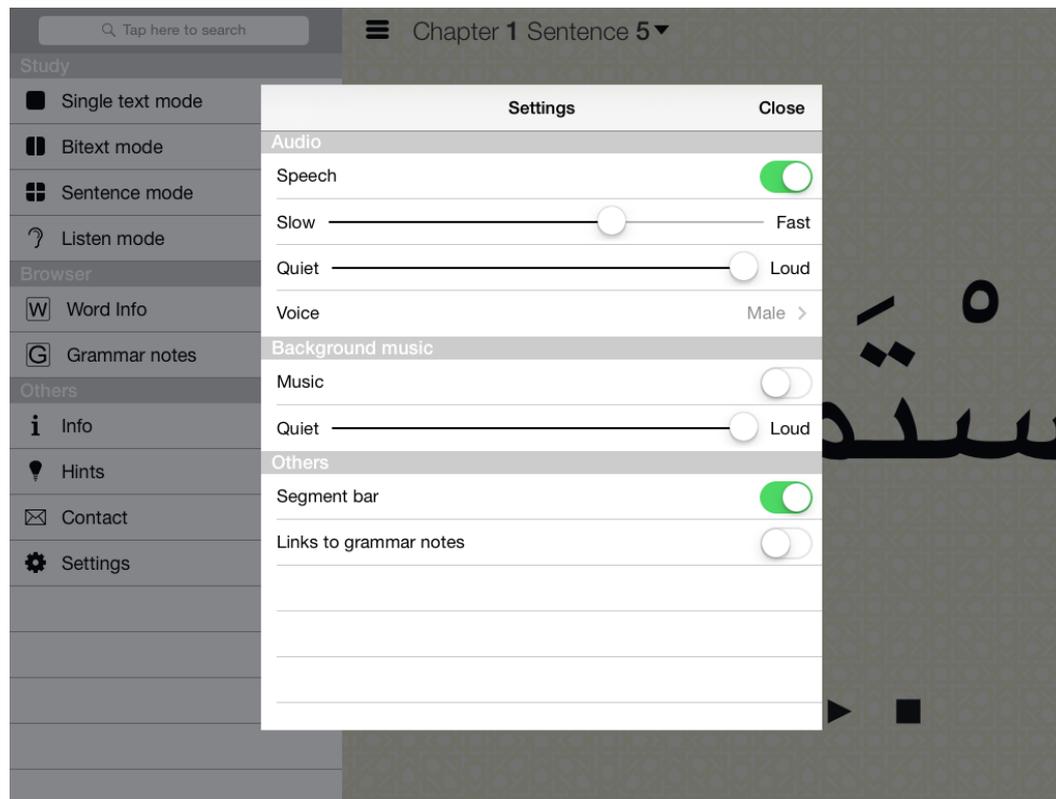
- Locate and jump to any section of story
- Accepts English, Arabic or romanized input
- Finds all instances (inflected forms) of Arabic word
- No need to know canonical form or root of verb

The screenshot shows a search interface with a search bar containing the text 'tura'. Below the search bar are two tabs: 'Arabic' (selected) and 'English'. The search results are displayed in a list format, showing the chapter and verse reference followed by the text snippet where the word is found. The word 'tura' is highlighted in red in the original image.

| | Arabic | English |
|------|---|---------|
| 1-6 | ... rá'a min ba'īdin ghubāran y... | |
| 1-9 | ... a lináfsihi: túra man ha'ulā'i? | |
| 1-11 | wáhum 'in ra'awni qatalūni mi... | |
| 1-11 | ...an 'anzārihim ḥátta la yarawni . | |
| 1-12 | ... yára llušúša éinda murúrihi... | |
| 1-12 | ...a murúrihim wála yarawnahu . | |
| 1-18 | ... rá'āhu l'āna, wakāda 'an y... | |

Full Audio Functionality

- Clear native recordings with multiple voice options
- Recordings of both full sentences and individual segments
- Adjustable audio speed
- Optional background music



Customizable Multi-panel Interface

- Allows sentence-level analysis with up to four versions of the text
- User free to choose contents of each panel
- Four-panel mode ideal for in-depth study

The screenshot displays a four-panel interface for analyzing Arabic text. The top-left panel shows an English sentence: "Ali Baba ea... he needed for a living... firewood, which he co... a faraway forest, and... back on his donkey to s... own's market." The top-right panel shows the corresponding Arabic text: "فَكَانَ عَلِيٌّ مَا يَحْتَاجُ إِلَيْهِ مِنَ الْقَوْدِ حَطَبِ بَعِيدَةٍ وَيَعُودُ بِهِ لِبَيْعَةِ فِي سُلَّةِ الْأَدْنَى". The bottom-left panel shows the Arabic word "جَمَعَ" (jama'aa) with its English definition: "1. gather, colle... 2. combine, jo... 3. add (in mat...". The bottom-right panel shows the Romanized Arabic text: "fakāna ʿalī... ibu ma yaḥtāju `ilāy qūti bibáyeyi... hī yajmáehu... baʿídatin wayaeúdu... márihi liyabíeahu f... adínati." Each panel has a dropdown menu with options: Unvoweled, Voweled, English, Romanized, and Dictionary. The interface is titled "Chapter 1 Sentence 5" and includes navigation icons.

Grammar Notes

- Help learners understand difficult grammatical points
- Accessible by color coding from main text

Chapter 1 Sentence 5

| Browser | Grammar notes | Close |
|------------------------------------|--|-------|
| بَقِيَّ | | |
| إِحْتَاَجَ إِلَى | | |
| لَا حَظَّ أَنْ | | |
| تُرَى (يَا تُرَى) | <p>تُرَى (يَا تُرَى) túra (ya túra)</p> <p>I wonder</p> <p>تُرَى + ... + interrogative sentence</p> <p>This تُرَى túra, derived from رَأَى rá'a (to see), is a special turn of phrase meaning 'What do you think?', and is followed (or preceded) by a question.</p> | |
| أَغْلَبُ [أَكْثَرُ] أَلْظَنُّ أَنْ | | |
| مِنْ الْأَفْضَلِ [لِأَحْسَنِ]... | | |
| أَسْرَعَ بِ [فِي] | <p>يَا تُرَى أَيْنَ ذَهَبَ؟</p> <p>(ya) túra 'ayna dháhaba?</p> <p>I wonder where he went.</p> | |
| مَا لَبِثَ ... أَنْ | | |
| لَمْ يَعْذُ | <p>يَا تُرَى هَلْ رَضِيَ بِهِ؟</p> <p>(ya) túra hal raḍiya bíhi?</p> <p>I wonder whether he was satisfied with it.</p> | |
| مَخَافَةَ (مِنْ) أَنْ | | |
| أَقْدَمَ عَلَى | | |

on éala على

Verb Conjugator

- Helps learners master the highly complex Arabic verb system
- Based on CJKI's popular Arabic Verb Conjugator app (CAVE)
- Full paradigm for any conjugated verb form

Chapter 1 Sentence 5

Ali F
for a
whic
fores
donk

فكان علي بابا يكسب ما يحتاج إليه
من القوت ببيع الحطب الذي
يجمعه في غابة بعيدة ويعود به
على حماره ليبيعه في سوق
المدينة.

fakāna ʿalī bāba yáksibu ma
yahtāju 'ilāyhi mína lqūti bibáyeyi
lḥáṭabi lladhī yajmáehu fi
ghábatin baʿídatin wayaʿúdu bíhi
ʿála ḥimárihi liyabíʿahu fi súqi
lmadínati.

إِحْتَاَجَ
'ihtāja
need, want

Perfect Active

| | | | |
|-------|------------|--------|--------------|
| 1 S | I needed | أَنَا | إِحْتَجْتُ |
| 2 S M | you needed | أَنْتَ | إِحْتَجْتَ |
| 2 S F | you needed | أَنْتِ | إِحْتَجْتِ |
| 3 S M | he needed | هُوَ | إِحْتَاَجَ |
| 3 S F | she needed | هِيَ | إِحْتَاَجَتْ |

إِلَيْهِ

يَجْمَعُهُ

he collected

yajmáehu

يَجْمَعُهُ

Word Structure

- Provides grammatical analysis of each word
- Decomposes words into prefixes, suffixes, and stems
- Provides clear understanding of how components interrelate

Chapter 1 Sentence 5

Word Structure

وَيَجْمَعُهُ *wayajmācuhu* and he collects it
 consists of the following components:

وَ + يَجْمَعُ + هُ

وَ *wa* conjunction 'and'

يَجْمَعُ *yajmācu* verb 'he collects'
 Imperfect Active third person masculine
 from جَمَعَ *jāmaʿa* 'collect' (Form I S3)

هُ *hu* pronoun suffix 'he'

فكان علي بابا يكسب ما يحتاج إليه
 من القوت ببيع الحطب الذي
 يجمعه في غابة بعيدة ويعود به
 على حماره ليبيعه في سوق
 المدينة.

fakāna ʿalī bāba yāksibu ma
 yaḥtāju 'ilāyhi mīna l-qūti bibāyēi
 l-ḥātabi lladhī yajmāʿuhu fī
 ghābatin baʿīdatin wayaeūdu bīhi
 ʿāla ḥimārihi liyabīʿahu fī sūqi
 l-madīnati.

← he collected yajmāʿuhu يَجْمَعُهُ →

Single Text Mode

- Best suited for advanced learners
- Segment bar provides meanings and pronunciation

☰ Chapter 1 Sentence 5 ▾ ▷ + āḥ

فكان علي بابا يكسب ما يحتاج إليه من القوت ببيع الحطب الذي يجمعه في غابة بعيدة ويعود به على حماره ليبيعه في سوق المدينة.

وحدث ذات يوم، بينما كان علي بابا راجعا يركب حماره إلى المدينة، أن رأى من بعيد غبارا يملأ الجو، ويحجب الأشياء.

ولاحظ أن الغبار يقترب منه ويتقدم نحو المكان الذي كان يقف فيه.

ثم أمكنه أن يتبين بين الغبار رجالا يركبون خيلا، ويغنون بأصوات عالية ويضحكون مسرورين.

فقال علي بابا لنفسه: ترى من هؤلاء؟

← earned fakāna yāksibu فَكَانَ يَكْسِبُ →

Thank you

شُكْرًا كَثِيرًا

Jack Halpern
The CJK Dictionary Institute
www.cjk.org