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Towards an encoding for Kulitan in Unicode

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Towards an encoding for Kulitan in Unicode

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1 Introduction

This is a working document for developing an encoding for the ‘Kulitan’ script in the Unicode standard. Its purpose is to bring the script to the attention of the Unicode Technical Committee and to present a foundation for discussions with the user community regarding the best approach for representing Kulitan text on digital devices. All information presented here is subject to change based upon feedback from users and additional research. A formal proposal will be prepared once the encoding model and other details have been finalized.

The major issues that require feedback are:

1. *Script name* What is the preferred name for the script: ‘Kulitan’, ‘Kapampangan’, or another?
2. *Glyphs* Should representative glyphs be based upon traditional or modern calligraphic forms?
3. *Vowels* Which encoding model for vowels is most suitable (see § 4.1.1)?
4. *Consonants* Should *ya* and *wa* be encoded as atomic letters or using letter sequences (see § 4.1.2)?
5. *Virama* Has a VIRAMA-like vowel silencer been introduced for the script?
6. *Digits* Are digits used in the script (see § 4.1.5)? If so, are they unique or borrowed?
7. *Collation* Which is the preferred alphabetic order for the script (see § 4.2)?
8. *Orientation* How to handle orientations for vertical and horizontal text (see § 4.3)? Would usage of ZERO-WIDTH JOINER be acceptable for handling the rendering of orthographic syllables?
9. *Other features* Are there other features or conventions of Kulitan that are absent from this document?

Please submit feedback to the author at the email address given above. Also, please distribute this document to any individuals who have knowledge of Kulitan or an interest in the digital representation of the script.

2 Background

Kulitan or ‘Súlat Kapampáŋan’ is a modern script used in the Philippines for writing the Pampanga or Kapampangan language (ISO 639-3: pam) of Pampanga province. It is not the primary script for the language, but is used by several speakers of Kapampangan alongside the standard Latin orthography. Kulitan is ultimately derived from the Brahmi script and is based upon the historical script used in Pampanga, which is related most closely to Tagalog and to the Buhid, Hanunoo, and Tangbanwa scripts (see tables 1 and 2).

The modern Kulitan possesses several innovations that distinguish it from its historical Pampanga ancestor, as well as from other related Philippine scripts. Firstly, although several Kulitan letters are similar to those found in related scripts, there are differences in the assignment of phonetic values to letters. Secondly, Kulitan is now normatively written vertically in syllabic clusters from top to bottom in lines that advance from right to left. It also has a horizontal orientation in which syllabic clusters are stacked vertically and advance from left to right. Thirdly, the glyphic representations of letters have evolved as a result of calligraphic practices. Fourthly, some vowel signs have alternate positions based upon the text direction. Lastly, a differentiation in the shapes of vowel letters for independent and dependent forms is recognizable in the most recent sources.

Súlat Kapampáŋan was described by Christopher Miller in Unicode Technical Note #35 “Indonesian and Philippine Scripts and Extensions” (2011: 9–11). Miller noted that the script “has found popularity in marginal uses similar to the Tagalog script, including calligraphy, tattoos, and emblematic uses such as commercial and official logos” (2011: 9). This assessment is corroborated by current research. There is an active community of Kulitan users, who post images of calligraphy and renderings of Kapampangan texts and other materials on Facebook, Instagram, Tumblr, Twitter, and various blog sites. Books on the script have also been published, such as *An Introduction to Kulitan: The Indigenous Kapampangan Script* by Michael R. M. Pangilinan (Angeles City, Philippines: Center for Kapampangan Studies, 2012). There is also active technological development of the script. The first digitized font for Kulitan was designed in 1996 by Emerson Navarro Camaya. Other fonts have been produced since then, such as ‘Baybayin Pamagkulit’ by Norman de los Santos. Developers have also designed text-editing software specifically for Kulitan in an attempt to handle the vertical orientation of the script.

Although Kulitan is actively used, it cannot be represented on modern digital devices in plain text because it is not encoded in Unicode. As a result, when users exchange documents in Kulitan they must do so through the medium of images. All Kulitan fonts are mapped onto the Unicode block for Latin or one of the Philippine scripts, or a legacy encoding. Including Kulitan in Unicode would provide its users with the ability to use, preserve, and develop support for it using current technologies.

3 Script details

3.1 Script name

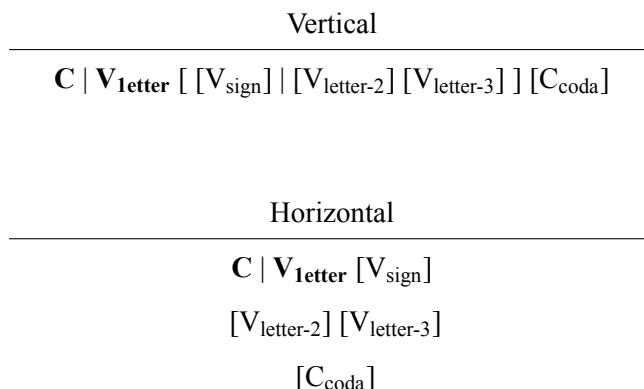
The name ‘Kulitan’ is tentatively assigned to the script block. Another option may be ‘Kapampangan’.

3.2 Script structure

Kulitan is an alphasyllabary. Consonant letters possess the inherent vowel *a*. There is no VIRAMA for denoting the absence of the inherent vowel. A coda consonant is marked by its position in an orthographic syllable. There are three basic vowel letters (*a*, *i*, *u*) and two combining signs for dependent forms (*i*, *u*). Independent vowels are written using a single letter, doubled letters, or a combination of two letters. Dependent vowels are indicated with a vowel letter or a compound of a combining sign and a vowel letter.

3.3 Syllable structure

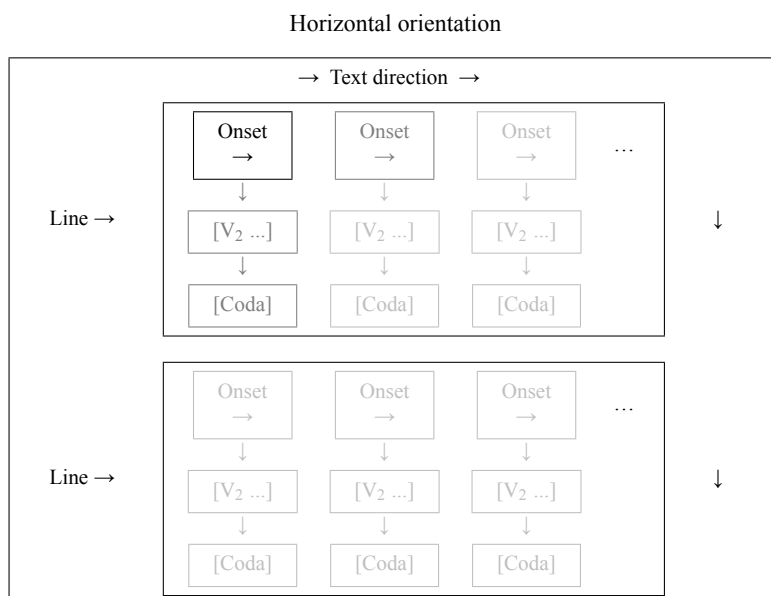
The structures of orthographic syllables depend upon the orientation of the text:



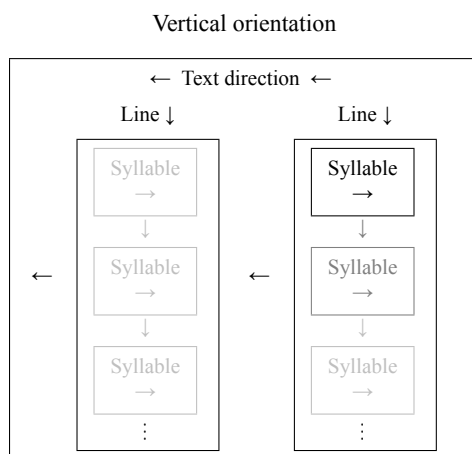
In horizontal orientation, each character in a syllable except for a combining vowel sign is stacked sequentially beneath the preceding letter. In vertical mode, each character in a syllable is written sequentially.

3.4 Directionality

The script is written in both horizontal and vertical orientations. Text does not flow in a linear fashion in either mode, but is arranged according to orthographic syllables (see § 4.3). In horizontal orientation, text is arranged in groups of vertical syllabic blocks perpendicular to the text direction. Text flows from left to right and in lines that advance from top to bottom. Characters in a syllabic block are ordered left to right.



Vertical text flows from top to bottom and in lines that advance from right to left. Text is arranged in groups of horizontal syllables stacked perpendicular to the flow. The characters in a syllable are ordered left to right.



4 Encoding Model

4.1 Character repertoire

Two potential character repertoires are presented for purposes of discussion (see the code charts following page 10). These repertoires differ in their representations of vowels (see § 4.1.1). Ultimately, a single repertoire must be chosen. The representative glyphs shown here are illustrative, and are not intended to be aesthetic. New representative glyphs will be based upon forms preferred by the user community.

4.1.1 Vowels

Independent and dependent vowels are represented in Kulitan as follows:

	Independent form		Dependent form	
	Vertical	Horizonal	Vertical	Horizonal
<i>a</i>	ᵛ	ᵛ	- <i>a</i>	—
<i>á</i>	ᵛᵛ	ᵛᵛ	- <i>á</i>	○ᵛ
<i>i</i>	ᵛ	ᵛ	- <i>i</i>	○
<i>í</i>	ᵛᵛ	ᵛᵛ	- <i>í</i>	○ᵛ
<i>u</i>	ᵛ	ᵛ	- <i>u</i>	○
<i>ú</i>	ᵛᵛ	ᵛᵛ	- <i>ú</i>	○ᵛ
<i>e</i>	ᵛᵛ	ᵛᵛ	- <i>e</i>	○ᵛ
<i>o</i>	ᵛᵛ	ᵛᵛ	- <i>o</i>	○ᵛ

The ○ dotted circle in the column for dependent forms of vowels represents a base consonant.

There are three basic vowel letters in Kulitan: $\mathcal{V} a$, $\mathcal{N} i$, $\mathcal{U} u$. These letters are used for representing independent forms of all vowels. Long vowels are indicated by doubling; other vowels are indicated using mixed combinations. These compounds may be rendered as ligatures, in which the letters are written as overlapping or fused:

	Regular	Ligated	
\acute{a}	$\mathcal{V}\mathcal{V}$	$\mathcal{V}\mathcal{V}$	$\mathcal{V} a + \mathcal{V} a$
\acute{i}	$\mathcal{N}\mathcal{N}$	$\mathcal{N}\mathcal{N}$	$\mathcal{N} i + \mathcal{N} i$
\acute{u}	$\mathcal{U}\mathcal{U}$	$\mathcal{U}\mathcal{U}$	$\mathcal{U} u + \mathcal{U} u$
e	$\mathcal{V}\mathcal{N}$	$\mathcal{V}\mathcal{N}, \mathcal{N}\mathcal{V}$	$\mathcal{V} a + \mathcal{N} i$
o	$\mathcal{V}\mathcal{U}$	$\mathcal{V}\mathcal{U}$	$\mathcal{V} a + \mathcal{U} u$

Dependent forms of vowels are represented using the basic vowel letters and two special combining signs. The signs $\overset{\circ}{\mathcal{V}}$ and $\overset{\circ}{\mathcal{U}}$ represent i and u , respectively, in dependent contexts. These signs are used in conjunction with $\mathcal{N} i$ and $\mathcal{U} u$ for indicating the long vowels \acute{i} and \acute{u} . The letters i and u are used by themselves for dependent forms of e and o , respectively. The vowel a has no dependent form because it is inherent in each consonant letter. Dependent vowels are written with consonants as shown below with the letter ka :

	Vertical	Horizontal		Vertical	Horizontal
ka	$=$	$=$	ku	$\overset{\circ}{=}$	$\overset{\circ}{=}$
$k\acute{a}$	$=\mathcal{V}$	$\overset{\circ}{=}\mathcal{V}$	$k\acute{u}$	$\overset{\circ}{=}\mathcal{U}$	$\overset{\circ}{=}\mathcal{U}$
ki	$\overset{\circ}{=}$	$\overset{\circ}{=}$	ke	$=\mathcal{N}$	$\overset{\circ}{=}\mathcal{N}$
$k\acute{i}$	$\overset{\circ}{=}\mathcal{N}$	$\overset{\circ}{=}\mathcal{N}$	ko	$=\mathcal{U}$	$\overset{\circ}{=}\mathcal{U}$

Based upon the orthography of vowels in Kulitan, there are two primary approaches to their representation in encoded text. These are described below.

Model #1 Encode the three vowel letters (a , i , u) and the two combining signs ($-i$, $-u$):

\mathcal{V}	KULITAN LETTER A
\mathcal{N}	KULITAN LETTER I
\mathcal{U}	KULITAN LETTER U
$\overset{\circ}{\mathcal{V}}$	KULITAN VOWEL SIGN I
$\overset{\circ}{\mathcal{U}}$	KULITAN VOWEL SIGN U

With these characters, all independent vowels may be represented using a single letter, doubled letters, or a compound of two letters:

<i>a</i>	Ɪ	Ɪ LETTER A
<i>á</i>	ꞮꞮ	Ɪ LETTER A + Ɪ LETTER A
<i>i</i>	Ɪ̣	Ɪ̣ LETTER I
<i>í</i>	Ɪ̣Ɪ̣	Ɪ̣ LETTER I + Ɪ̣ LETTER I
<i>u</i>	Ɪ̥	Ɪ̥ LETTER U
<i>ú</i>	Ɪ̥Ɪ̥	Ɪ̥ LETTER U + Ɪ̥ LETTER U
<i>e</i>	Ɪ̣Ɪ̥	Ɪ̣ LETTER A + Ɪ̥ LETTER I
<i>o</i>	Ɪ̣Ɪ̥	Ɪ̣ LETTER A + Ɪ̥ LETTER U

The dependent vowels may be represented using the three vowel letters and a combination of a combining sign and letter, as appropriate:

<i>-á</i>	Ɪ	Ɪ LETTER A
<i>-i</i>	̣̇	̣̇ VOWEL SIGN I
<i>-í</i>	̣̇Ɪ̣	̣̇ VOWEL SIGN I + Ɪ̣ LETTER I
<i>-u</i>	̥̇	̥̇ VOWEL SIGN U
<i>-ú</i>	̥̇Ɪ̥	̥̇ VOWEL SIGN U + Ɪ̥ LETTER U
<i>-e</i>	Ɪ̣	Ɪ̣ LETTER I
<i>-o</i>	Ɪ̥	Ɪ̥ LETTER U

Model #2 Encode the three basic vowels, three doubled letters, and two compound letters:

<i>a</i>	Ɪ	KULITAN LETTER A
<i>á</i>	ꞮꞮ	KULITAN LETTER AA
<i>i</i>	Ɪ̣	KULITAN LETTER I
<i>í</i>	Ɪ̣Ɪ̣	KULITAN LETTER II
<i>u</i>	Ɪ̥	KULITAN LETTER U
<i>ú</i>	Ɪ̥Ɪ̥	KULITAN LETTER UU
<i>e</i>	Ɪ̣Ɪ̥	KULITAN LETTER E
<i>o</i>	Ɪ̣Ɪ̥	KULITAN LETTER O

Also encode a corresponding set of combining vowel signs for representing dependent vowels:

-á	◌ꞗ	VOWEL SIGN AA
-i	◌◌̇	VOWEL SIGN I
-í	◌◌̇ꞗ	VOWEL SIGN II
-u	◌◌̆	VOWEL SIGN U
-ú	◌◌̆ꞗ	VOWEL SIGN UU
-e	◌◌̃ꞗ	VOWEL SIGN E
-o	◌◌̄ꞗ	VOWEL SIGN O

The rationale for model #2 is based upon evidence in sources that show distinctions between independent and dependent forms of vowels (see figure 4). For instance, the form ꞗ is shown for the letter *a*, but the syllable *sá* is rendered as ꞗꞗ instead of ꞗꞗ. This suggests a ‘dependent’ form of *a* in the shape of ꞗ, where the left curve of ꞗ is lowered to nearly the mid-point of the glyph height and is joined to the ꞗ *sa*. Feedback from the user community is required for determining if these differences between independent ꞗ and dependent ꞗ are semantic or merely stylistic. Furthermore, the ligated or fused forms of the doubled and compound letters in figure 4 may be analyzed as distinctive letters instead of as character sequences.

4.1.2 Consonant letters

The tentative repertoire for consonants contains eleven letters:

	Character name	Phonetic value
ꞗ	KULITAN LETTER KA	/k/
ꞗ	KULITAN LETTER GA	/g/
ꞗꞗ	KULITAN LETTER NGA	/ŋ/
ꞗ	KULITAN LETTER TA	/t/
ꞗ	KULITAN LETTER DA	/d/, /ɾ/
ꞗ	KULITAN LETTER NA	/n/
ꞗ	KULITAN LETTER PA	/p/
ꞗ	KULITAN LETTER BA	/b/
ꞗ	KULITAN LETTER MA	/m/
ꞗ	KULITAN LETTER LA	/l/
ꞗ	KULITAN LETTER SA	/s/

Kulitan does not have distinctive letters for *ya* (/j/) and *wa* (/w/). The sound *ya* and related syllables are represented using the following character sequences:

ya ʌʎ ʌ i + ʎ a

yi ʌ̃ ʌ i + ̄ -i

yu ʌ̣ ʌ i + ̣ -u

The sound *wa* is represented using the following character sequences:

wa ʋʎ ʋ u + ʎ a

wi ʋ̃ ʋ u + ̄ -i

wu ʋ̣ ʋ u + ̣ -u

we ʋʎʌ̃ ʋ u + ʎ a + ʌ̃ i



It may be practical to encode the sequences for *ya* and *wa* as atomic characters. Feedback on this issue is requested from the user community.

4.1.3 Syllable-final consonants

A syllable-final or coda consonant is indicated by the position of the letter relative to the rest of the syllable. The placement is determined by the orientation of the text. Compare the representations of *sing* and *si·nga* below:

Vertical	Horizontal
	
<i>sing</i> <i>si·nga</i>	<i>sing</i> <i>si·nga</i>

4.1.4 Punctuation

Spaces are generally not used. For indicating the ends of text sections in horizontal mode the common punctuation marks / U+1735 PHILIPPINE SINGLE PUNCTUATION and // U+1736 PHILIPPINE DOUBLE PUNCTUATION may be used. Signs similar to these that are rotated 90° as  and  are used in vertical mode (see figure 12). It may be necessary to encode these as separate punctuation characters for Kulitan.

4.1.5 Digits

Historical digits are not attested. Digits may have been introduced by modern users. Examples of digits supposedly used in Kulitan are shown in figure 17.

4.2 Collation

There are different patterns for collation. An order based upon the traditional arrangement of the script is:

$$\mathcal{V}a < \mathcal{N}i < \mathcal{V}u < \wedge ga < =ka < \mathfrak{D}nga < \mathcal{L}ta < \mathcal{E}da < \mathcal{T}na < \\ \mathcal{T}la < \mathcal{S}sa < \mathcal{F}ma < \mathcal{V}pa < \mathcal{O}ba < \overset{\circ}{\mathcal{O}}-i < \overset{\circ}{\mathcal{O}}-u$$

Another order based upon the Brahmi pattern used for other Philippine scripts in Unicode is:

$$\mathcal{V}a < \mathcal{N}i < \mathcal{V}u < =ka < \wedge ga < \mathfrak{D}nga < \mathcal{L}ta < \mathcal{E}da < \mathcal{T}na < \\ \mathcal{V}pa < \mathcal{O}ba < \mathcal{F}ma < \mathcal{T}la < \mathcal{S}sa < \overset{\circ}{\mathcal{O}}-i < \overset{\circ}{\mathcal{O}}-u$$

4.3 Text orientation

Examples of various orientations of Kulitan text are shown below:

horizontal	$\begin{array}{c} \mathcal{V} \mathcal{L} = \mathcal{V} \mathcal{S} \mathcal{S} \\ \mathcal{T} \quad \mathcal{V} \mathfrak{D} \mathfrak{D} \\ \mathfrak{D} \end{array}$	$\begin{array}{c} a \ ti \ ku \ pu \ si \ si \\ n \quad u \ ng \ ng \\ ng \end{array}$
vertical	$\begin{array}{c} \mathcal{V} \\ \mathcal{L}\mathcal{T} \\ = \\ \mathcal{V}\mathcal{V}\mathfrak{D} \\ \mathfrak{D}\mathfrak{D} \\ \mathfrak{D}\mathfrak{D} \end{array}$	$\begin{array}{c} a \\ tin \\ ku \\ p\acute{u}ng \\ sing \\ sing \end{array}$
linear	$\mathcal{V}\mathcal{L}\mathcal{T} = \mathcal{V}\mathcal{V}\mathfrak{D} \ \mathfrak{D}\mathfrak{D}\mathfrak{D}\mathfrak{D}$	$atin \ ku \ p\acute{u}ng \ singsing$

The linear mode does not occur in actual usage. Rather, it illustrates how Kulitan text would be displayed in the absence of proper vertical and horizontal support. It may be considered the fallback display.

In both horizontal and vertical modes, all Kulitan characters except for two are displayed upright, with the same orientation as for representative glyphs. The “Unicode Technical Report #50: Unicode Vertical Text Layout” describes the property `Vertical_Orientation` (`vo`) for specifying the orientation of characters. Accordingly, the property would be defined as `Vertical_Orientation=U` or `vo=U`, where the value ‘U’ indicates that the glyphs remain upright in both horizontal and vertical text layout. The exceptions are the two vowel signs:

	Vertical (normative glyph)	Horizontal (repositioned glyph)
KULITAN VOWEL SIGN I	◌̇	◌̇◌
KULITAN VOWEL SIGN U	◌̈	◌̈◌

When KULITAN VOWEL SIGN I and KULITAN VOWEL SIGN U occur in horizontal orientation, their position relative to the base letter moves from roughly top and bottom, respectively, to left and right of the base. They have a `Vertical_Orientation=Tu` or `vo=Tu` where the value ‘Tu’ indicates that the glyphs do not appear upright and generally require a different glyph than the normative form.

4.4 Character data

Character properties and other data will be produced once the character repertoire is established.

5 References

Marcilla y Martín, Cipriano. 1895. *Estudio de los Antiguos Alfabetos Filipinos*. Malabón: Tipo-litografía del Asilo de Huérfanos.

Miller, Christopher. 2010. “Unicode Technical Note #35: Indonesian and Philippine Scripts and Extensions”. <http://www.unicode.org/notes/tn35/>

Pangilinan, Michael R. M. 2015. “Accurately representing Kapampáŋan phonology through the KAMBAL SIUÁLÁ ‘twin vowels’ spelling convention in KULITAN”. http://www.academia.edu/14363005/Accurately_representing_Kapamp%C3%A1ngan_phonology_through_the_KAMBAL_SIU%C3%81L%C3%82_twin_vowels_spelling_convention_in_KULITAN

———. “Assessing the current status of the Kapampangan ‘pre-Hispanic’ script”. http://www.academia.edu/5419294/Assessing_the_current_status_of_the_Kapampangan_pre-Hispanic_script

6 Acknowledgments

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	14C0	14C1
0	𑊀 14C00	3 14C10
1	𑊁 14C01	
2	𑊂 14C02	◌̇ 14C12
3	= 14C03	◌̈ 14C13
4	ˆ 14C04	
5	𑊅 14C05	
6	𑊆 14C06	
7	𑊇 14C07	
8	𑊈 14C08	
9	𑊉 14C09	
A	○ 14C0A	
B	𑊋 14C0B	
C		
D		
E	𑊌 14C0E	
F		

This model encodes vowels using the basic vowel letters and two vowel signs.

Vowel letters

- 14C00 𑊀 KULITAN LETTER A
- 14C01 𑊁 KULITAN LETTER I
- 14C02 𑊂 KULITAN LETTER U

Consonants

- 14C03 = KULITAN LETTER KA
- 14C04 ˆ KULITAN LETTER GA
- 14C05 𑊅 KULITAN LETTER NGA
- 14C06 𑊆 KULITAN LETTER TA
- 14C07 𑊇 KULITAN LETTER DA
- 14C08 𑊈 KULITAN LETTER NA
- 14C09 𑊉 KULITAN LETTER PA
- 14C0A ○ KULITAN LETTER BA
- 14C0B 𑊋 KULITAN LETTER MA
- 14C0C  <reserved>
- 14C0D  <reserved>
- 14C0E 𑊌 KULITAN LETTER LA
- 14C0F  <reserved>
- 14C10 3 KULITAN LETTER SA

Dependent vowel signs

- 14C12 ◌̇ KULITAN VOWEL SIGN I
- 14C13 ◌̈ KULITAN VOWEL SIGN U

	14C0	14C1	14C2
0	𐊀 14C00	𐊁 14C10	
1	𐊂 14C01		
2	𐊃 14C02		
3	𐊄 14C03	𐊅 14C13	
4	𐊆 14C04		
5	𐊇 14C05	3 14C15	
6	𐊈 14C06		
7	𐊉 14C07	𐊊 14C17	
8	= 14C08	◌ 14C18	
9	◌ 14C09	◌ 14C19	
A	𐊋 14C0A	◌ 14C1A	
B	𐊌 14C0B	◌ 14C1B	
C	𐊍 14C0C	◌ 14C1C	
D	𐊎 14C0D	◌ 14C1D	
E	𐊏 14C0E		
F	○ 14C0F		

This model represents vowels using distinct characters for all independent and dependent forms.

Vowel letters

- 14C00 𐊀 KULITAN LETTER A
- 14C01 𐊂 KULITAN LETTER A
- 14C02 𐊃 KULITAN LETTER I
- 14C03 𐊄 KULITAN LETTER I
- 14C04 𐊆 KULITAN LETTER U
- 14C05 𐊇 KULITAN LETTER U
- 14C06 𐊈 KULITAN LETTER E
- 14C07 𐊉 KULITAN LETTER O

Consonants

- 14C08 = KULITAN LETTER KA
- 14C09 ◌ KULITAN LETTER GA
- 14C0A 𐊋 KULITAN LETTER NGA
- 14C0B 𐊌 KULITAN LETTER TA
- 14C0C 𐊍 KULITAN LETTER DA
- 14C0D 𐊎 KULITAN LETTER NA
- 14C0E 𐊏 KULITAN LETTER PA
- 14C0F ○ KULITAN LETTER BA
- 14C10 𐊁 KULITAN LETTER MA
- 14C11 ◌ <reserved>
- 14C12 ◌ <reserved>
- 14C13 𐊅 KULITAN LETTER LA
- 14C14 ◌ <reserved>
- 14C15 3 KULITAN LETTER SA

Dependent vowel signs

- 14C17 ◌ KULITAN VOWEL SIGN AA
- 14C18 ◌ KULITAN VOWEL SIGN I
- 14C19 ◌ KULITAN VOWEL SIGN II
- 14C1A ◌ KULITAN VOWEL SIGN U
- 14C1B ◌ KULITAN VOWEL SIGN UU
- 14C1C ◌ KULITAN VOWEL SIGN E
- 14C1D ◌ KULITAN VOWEL SIGN O

	Kulitan	Tagalog	Hanunoo	Buhid	Tangbanwa
A	ᳵ	ᳵ	ᳵ	ᳵ	ᳵ
I	ᳶ	ᳶ	ᳶ	ᳶ	ᳶ
U	᳷	᳷	᳷	᳷	᳷
KA	᳸	᳸	᳸	᳸	᳸
GA	᳹	᳹	᳹	᳹	᳹
NGA	ᳺ	ᳺ	ᳺ	ᳺ	ᳺ
TA	᳻	᳻	᳻	᳻	᳻
DA	᳼	᳼	᳼	᳼	᳼
NA	᳽	᳽	᳽	᳽	᳽
PA	᳾	᳾	᳾	᳾	᳾
BA	᳿	᳿	᳿	᳿	᳿
MA	᳠	᳠	᳠	᳠	᳠
YA		᳡	᳡	᳡	᳡
RA			—	—	
LA	᳢	᳢	᳢	᳢	᳢
WA		᳣	᳣	᳣	᳣
SA	᳤	᳤	᳤	᳤	᳤
HA		᳥	᳥	᳥	

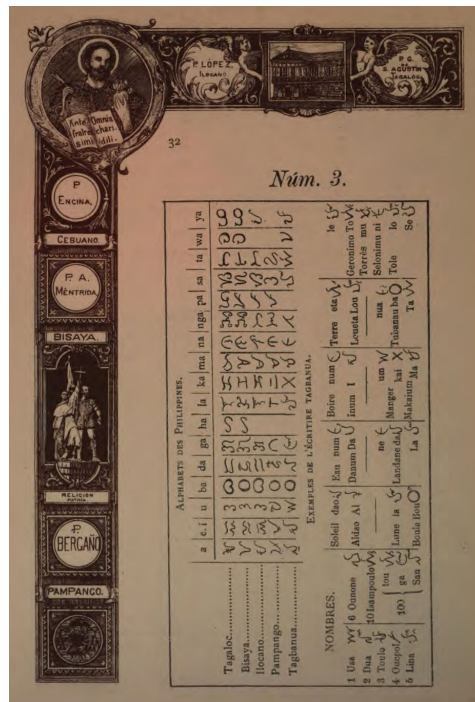
Table 1: Comparison of vowel and consonant letters across Philippine scripts.

	Kulitan	Tagalog	Hanunoo	Buhid	Tangbanwa
VOWEL SIGN I	ᳵ̇	ᳵ̇	ᳵ̇	ᳵ̇	ᳵ̇
VOWEL SIGN U	ᳶ̇	ᳶ̇	ᳶ̇	ᳶ̇	ᳶ̇
VIRAMA		ᳶ̇	ᳶ̇		

Table 2: Comparison of vowel signs across Philippine scripts.





















Figure 1: Historical script of Pampanga shown in a book on Philippine scripts (from Marcilla y Martin 1895: 26). The script is labelled ‘Núm. 12.’ and unnamed. The letterforms bear a strong resemblance to Kulitan.















(Rotated enlargement of the chart shown above.)

Figure 2: Comparison of Philippine scripts (from Marcilla y Martin 1895: 26). The ‘Pampango’ script is ‘Kulitan’.

Súlat Kapampáangan

ibat akmulán	ibat ípan	→	dalán díla	ibat lábi	siulá	pámisangsiulá	kambal siulá
 ga	 ta	→	 da ó ca	 ma	 a	 e	 -á-ó-â
 ka	 na	→	 la	 pa	 i	 o	 -í-ó-î
dalán ákung			sasalitsit				
 nga			 sa	 ba	 u		 -ú-ó-û

Indung Súlat	Anak Súlat							
								
								

Source: <http://siuala.com/wp-content/uploads/sulat-kapampangan-with-indu-anak.jpg>

Figure 4: Traditional analysis of Kulitan letters.

u	e	o						
nga	ta	da	na	la	sa	ma	pa	ba
ngi	ti	di	ni	li	si	mi	pi	bi
ngí/í	tí/í	dí/í	ní/í	lí/í	sí/í	mí/í	pí/í	bí/í
ngu	tu	du	nu	lu	su	mu	pu	bu
ngú/ú	tú/ú	dú/ú	nú/ú	lú/ú	sú/ú	mú/ú	pú/ú	bú/ú
nge	te	de	ne	le	se	me	pe	be
ngo	to	do	no	lo	so	mo	po	bo
ngang	tang	dang	nang	lang	sang	mang	pang	bang

Source: <http://www.omniglot.com/writing/kulitan.htm>

Figure 5: Kulitan consonant-vowel combinations.

Sulat Kapampangan Baybayin Pamagkulis Font Nordex © 2011

ga g	ta t	da/ra d	ma m	a a	e E	-á- ó -â A		
ka k	na n	la l	pa p	i e	i/u garlit i/u	-í- ó -î I		
nga N	sa s	ba b	syllable keystrokes	u o	o O	-ú- ó -û U		
sa s	-sá- -sâ sa	sí sí	-sí- -sî sie	su su	-sú- -sû suo	se se	so so	sang sN

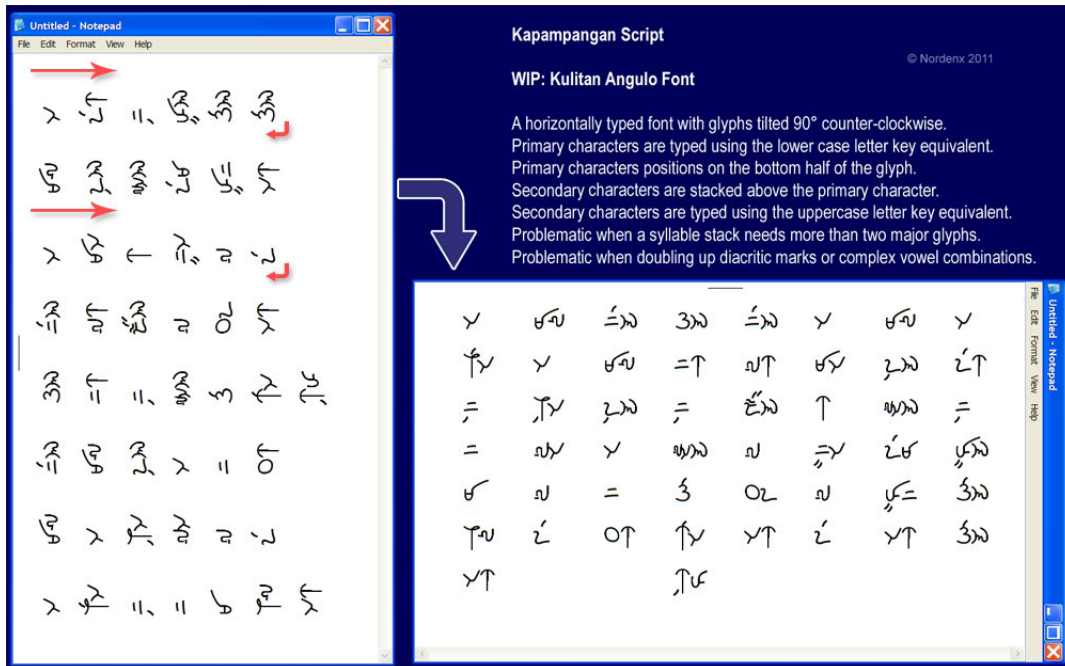
Source: <http://www.baybayinfonts.com/2011/08/baybayin-kapampangan.html>

Figure 6: Glyphs of the ‘Baybayin Pamagkulis’ font designed by Norman de los Santos.



Source: http://pre09.deviantart.net/86a6/th/pre/f/2013/117/c/a/kapampangan_schoolitan_font_by_nordenx-d63804a.png

Figure 7: Glyphs of the ‘Kapampangan Schoolitan’ font designed by Norman de los Santos.



Source: <http://www.baybayinfonts.com/2011/08/kulitan-angulo-typepad.html>

Figure 8: Screenshots of the Kulitan Angulo Typepad developed by Norman de los Santos for vertical typing of the script.

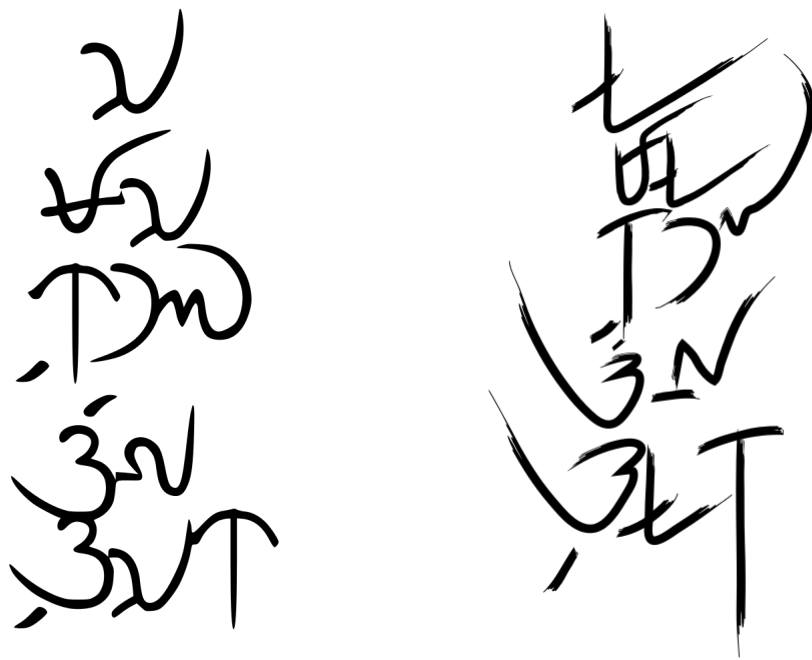
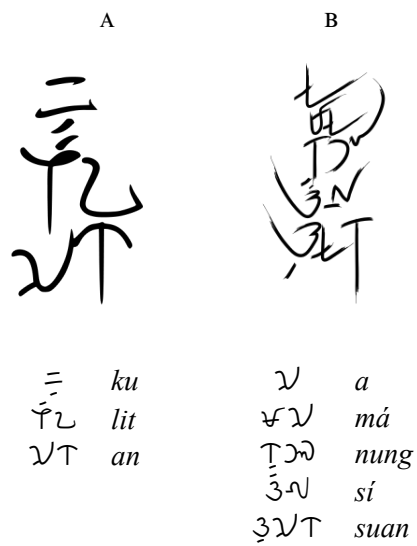


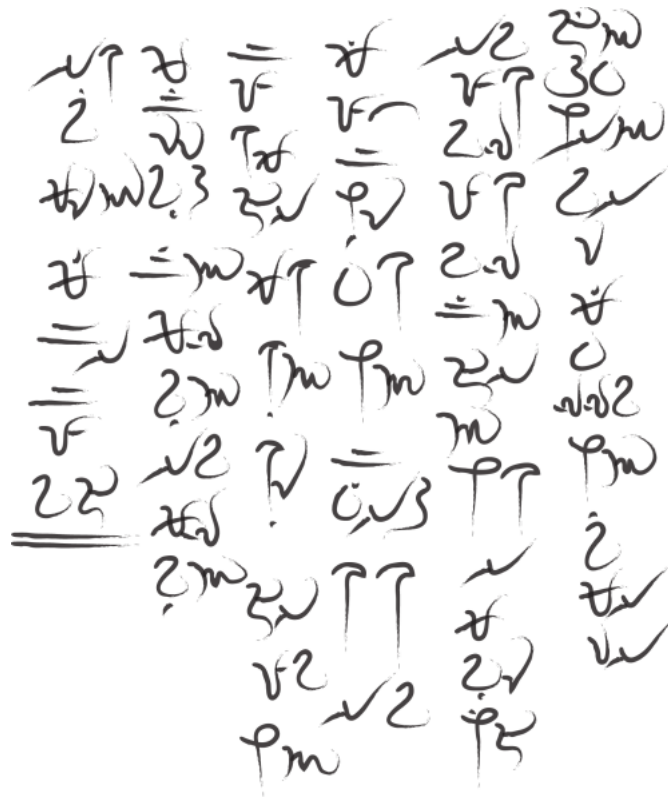
Figure 10: Comparison of “*amánung sísuán*” in typeset and calligraphic styles of Kulitan



A <https://commons.wikimedia.org/wiki/File:Kulitan.svg>

B https://commons.wikimedia.org/wiki/File:Amanung_Sisuan_in_Kulitan.svg

Figure 11: Examples of Kulitan text in vertical orientation.

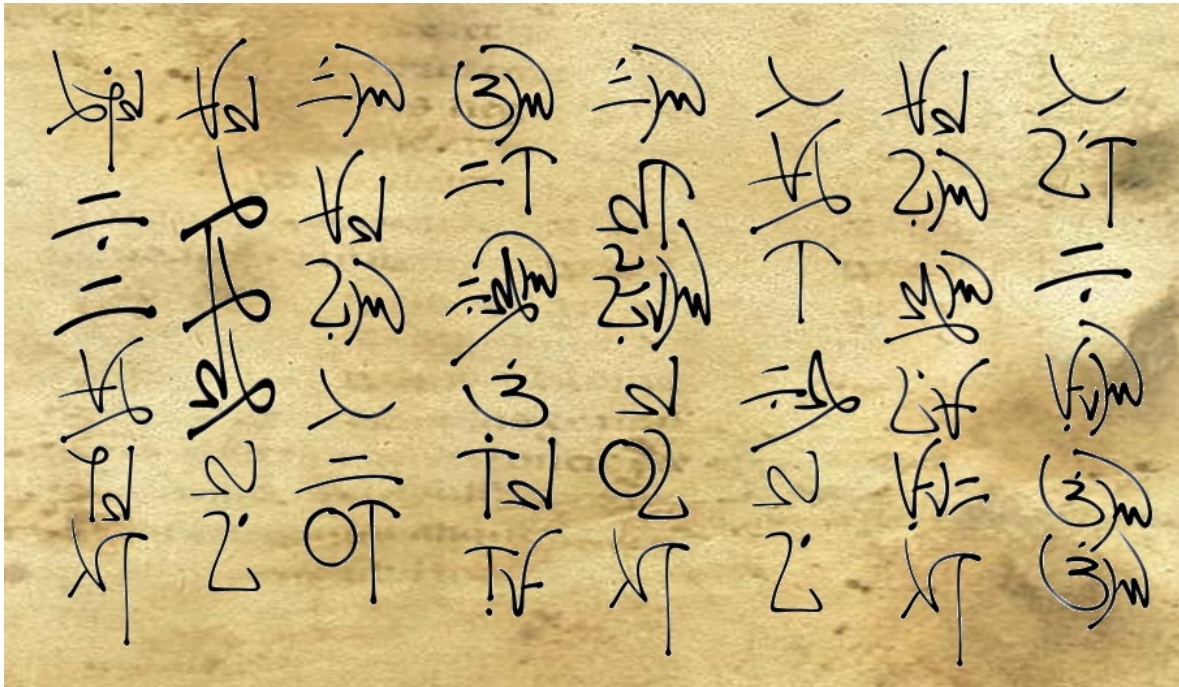


Ding sablâng táu mibaít lang timáua at panté panté king dângalan at matúlid. Mipagkalúban lang kabiasnan at kapanamdáman nung nú dápat lang makiútus king métung at métung anti móng mikákapatad.

All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.

Source: <http://sirjayvie.tumblr.com/post/47701973786/ding-sabl%C3%A2ng-t%C3%A1u-miba%C3%ADt-lang-tim%C3%A1ua-at-pant%C3%A9-pant%C3%A9-king-d%C3%A1ngalan-at-mat%C3%ADlid-mipagkal%C3%ABan-lang-kabiasnan-at-kapanamd%C3%A1man-nung-n%C3%BA-d%C3%A1pat-lang-maki%C3%ADtus-king-m%C3%A9tung-at-m%C3%A9tung-anti-m%C3%9Cng-mik%C3%A1kapatad>

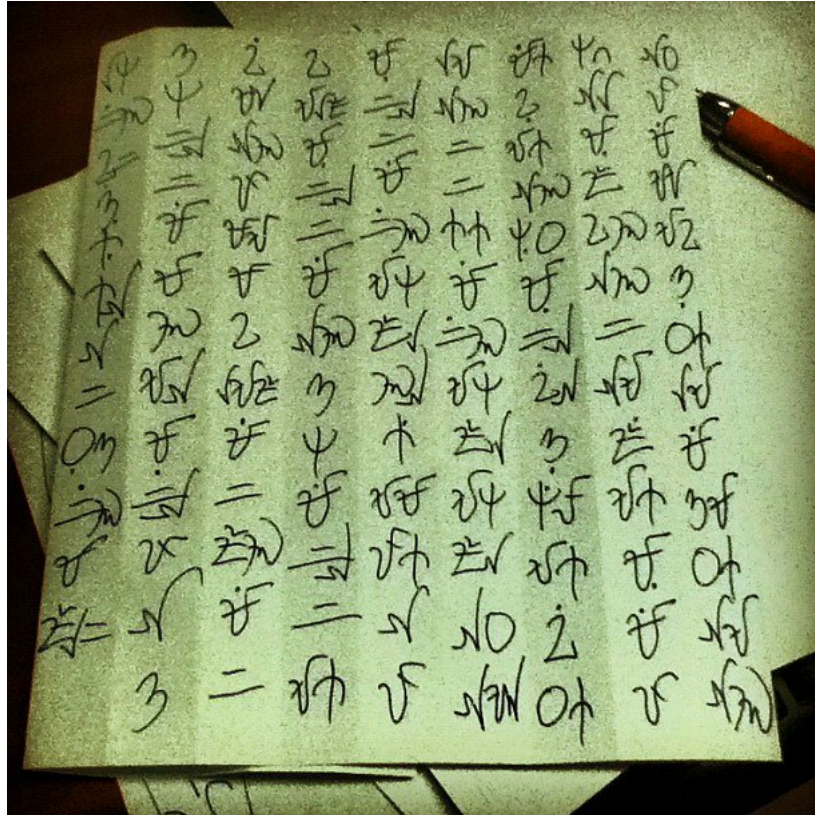
Figure 12: Translation of Article 1 of the ‘Universal Declaration of Human Rights’ into Kapampangan written in Kulitan.



Source: http://36.media.tumblr.com/tumblr_m5oq6hBhoa1rsqusgo1_1280.jpg

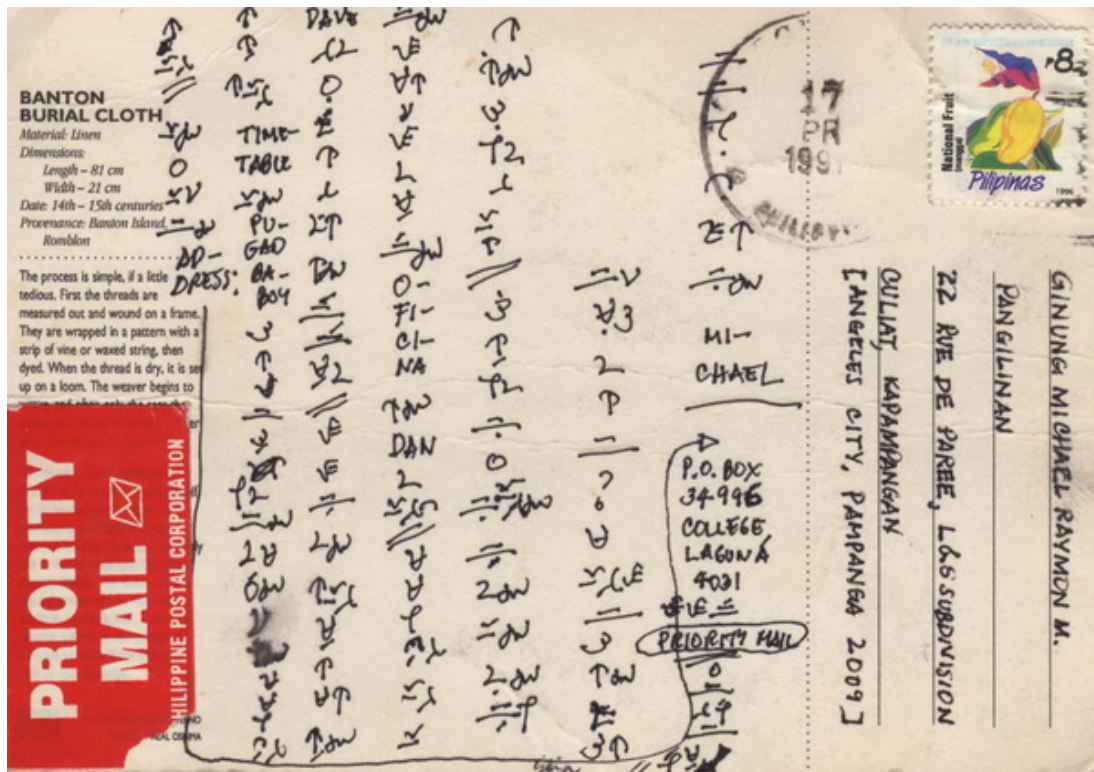
atin ku pung singsing
 metung yang timpukan
 amana kuwe iti
 king indung ibatan
 sangkan kuwang sininup
 king metung a kaban
 me ala ya iti
 ali ku kamalian

Figure 13: Hand-written text containing the song “*atin ku pung singsing*”.



Source: <http://siala.com/wp-content/uploads/Ibpa-Mi-by-Allandail-Lumanlan-River.jpg>

Figure 14: Example of modern vertical Kulitan calligraphy by Allandail Rivera y Lumanlan. The ‘Ibpâ Mi’ or a rendition of “The Lord’s Prayer”, a Christian text.



Source: <http://sualala.com/wp-content/uploads/Edwin-Camaya-1991-600.jpg>

Figure 15: A postcard from 1991 with text in Kulitan.

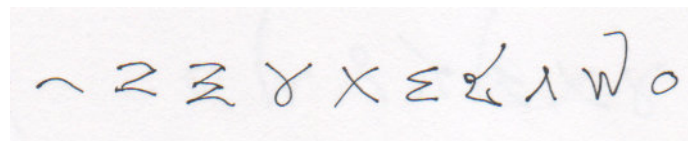
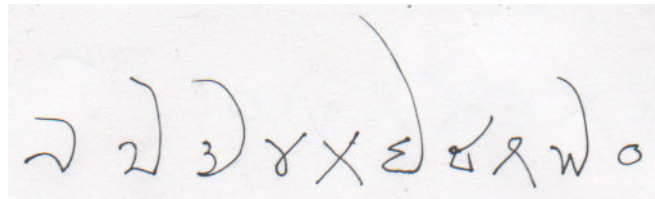
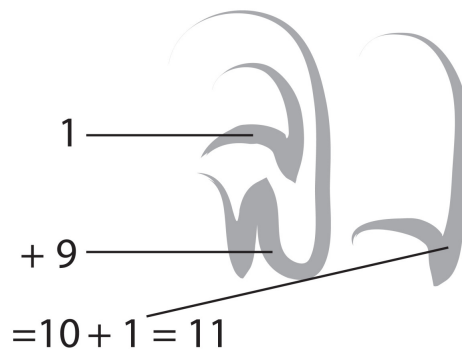


Source:

<http://sirjayvie.tumblr.com/post/46336241228/the-barangays-of-apalit-written-in-kulitan-the>

Figure 16: The names of the *barangay* in Apalit municipality of Pampanga province.

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19



Source: <http://sirjayvie.tumblr.com/post/47681040637/at-least-i-tried-ayun-i-was-trying-to-find>

Figure 17: Examples of numbers and digits supposed used in Kulitan.