Linguistic Olympiad Writing System

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What is a writing system?

- **Visual Representation** of Verbal Communication

Cat

貓

ねこ

แมว

Dog

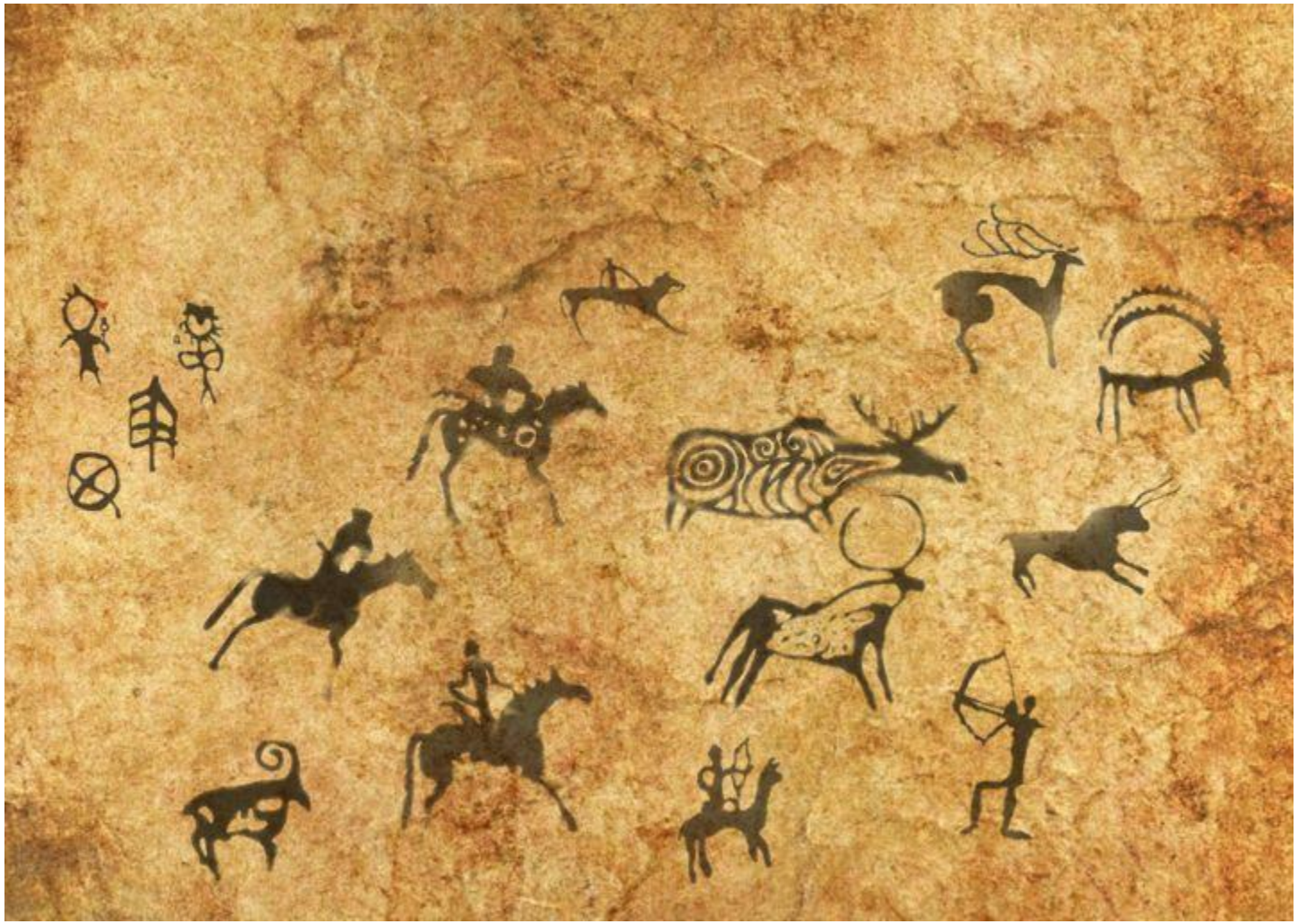
狗

いぬ

หมา

Pre-Writing

- Human first tried to record their story in a form of painting

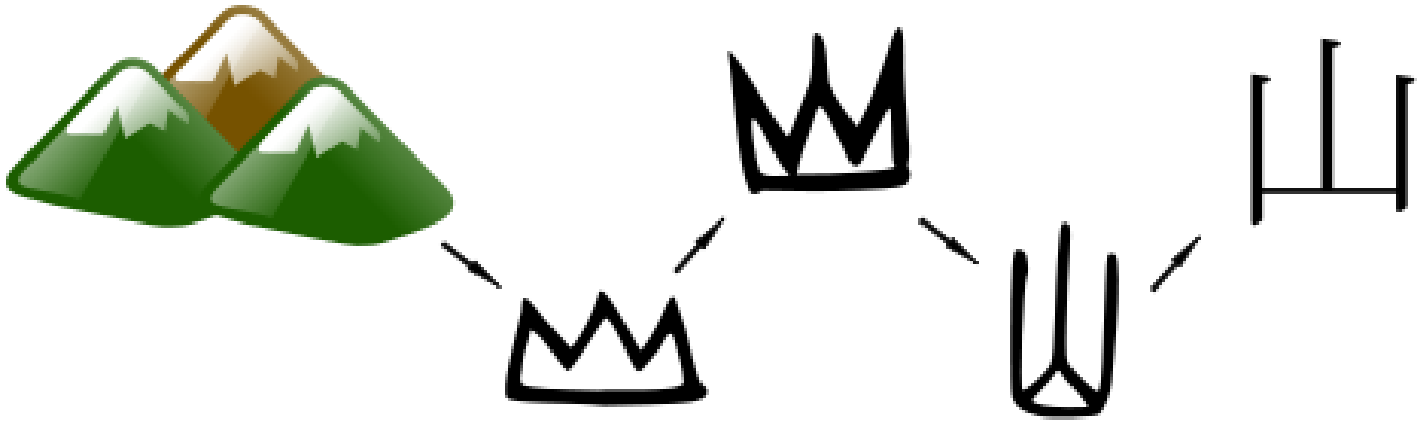


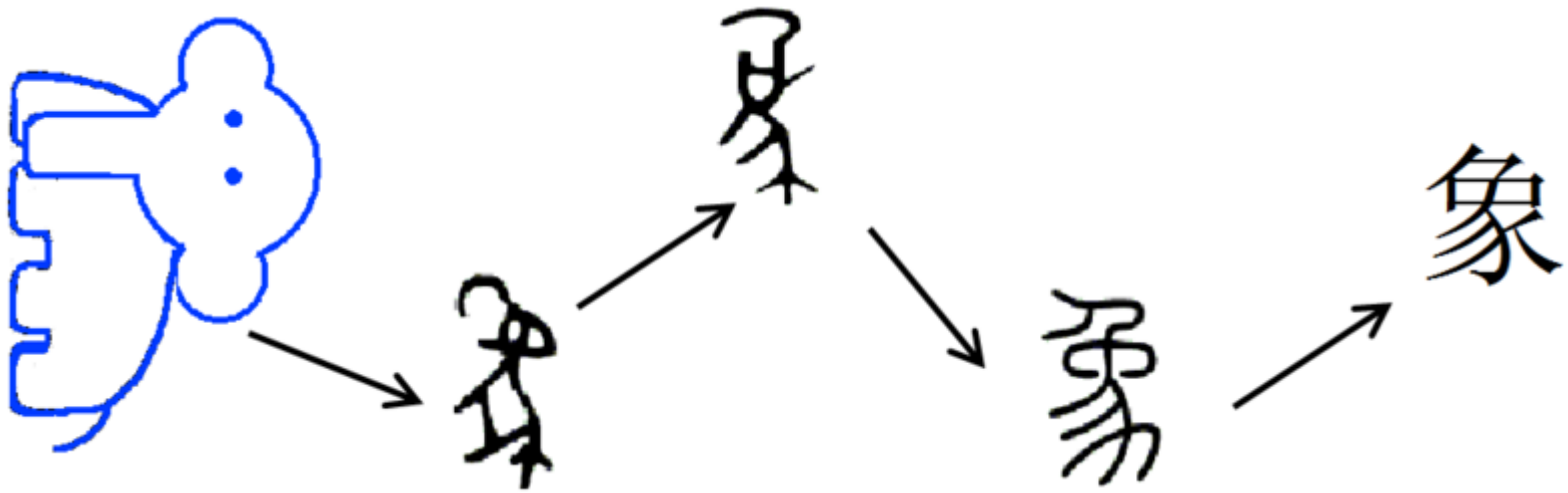
Early Form of Symbols

Minoan Civilisation

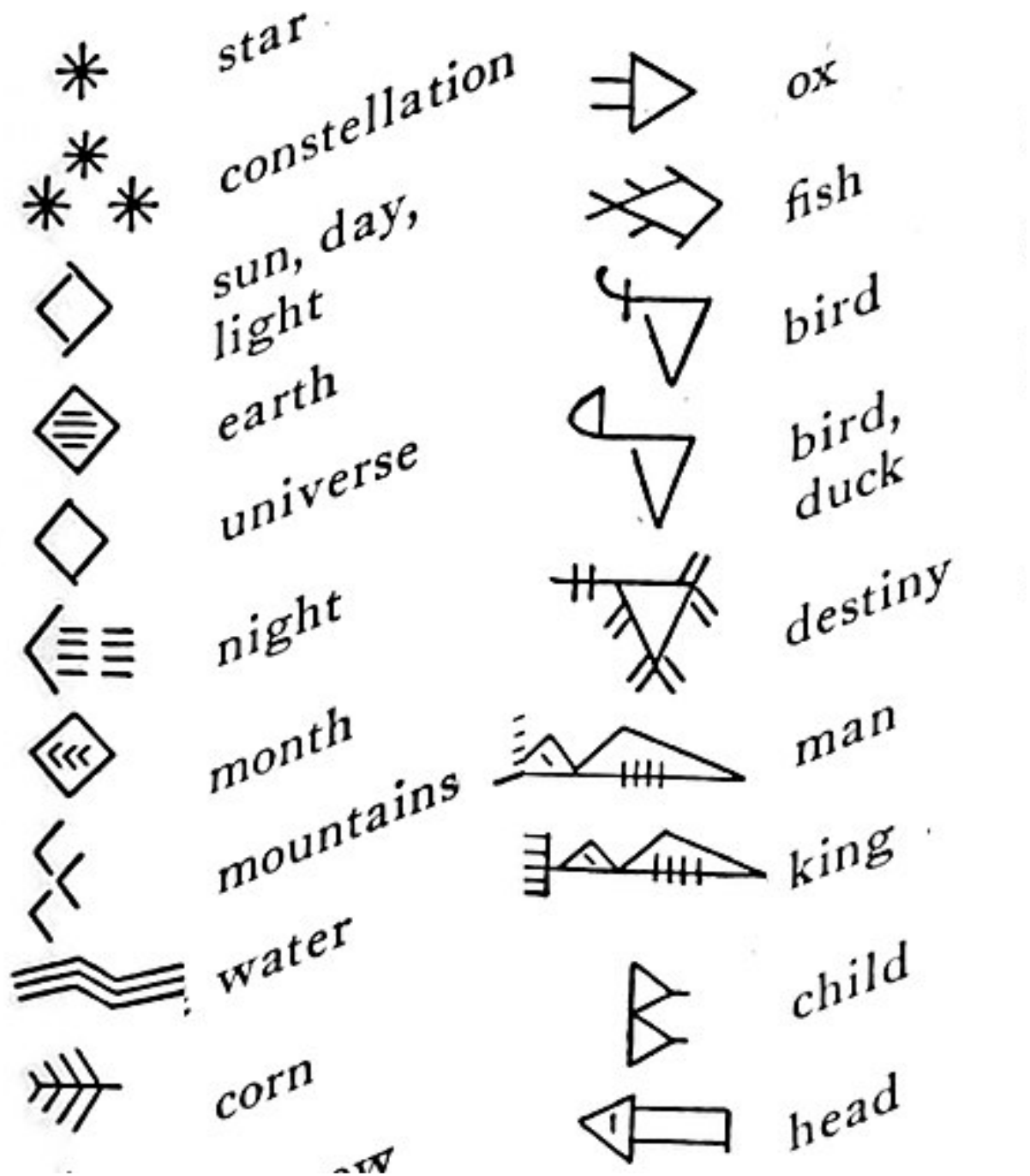
Indus Civilisation

Chinese Characters (Pictogram)

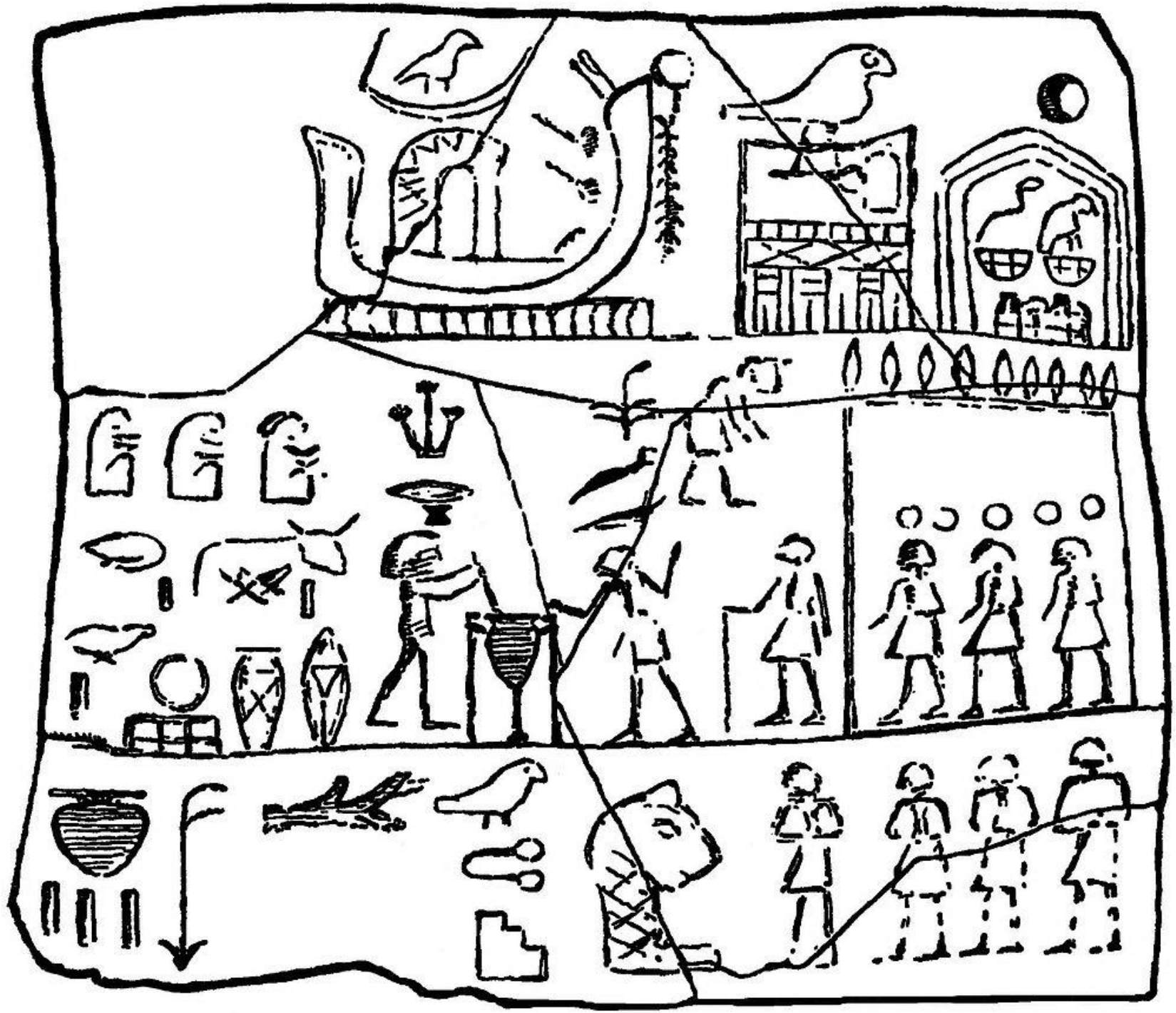




Mesopotamian Cuneiform (Pictogram)



Egyptian Hieroglyphs (Pictogram)



Rebus Principle

- use of existing symbols (then pictograms) purely for their sounds

eye

I

can

can

sea

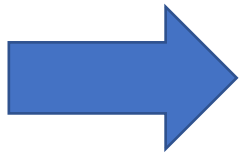
see

ewe

you

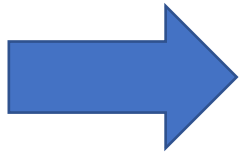
Chinese Characters (Logogram)

工
gōng



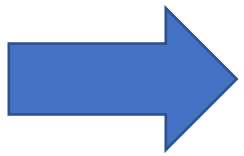
江
jiāng

黄
huáng



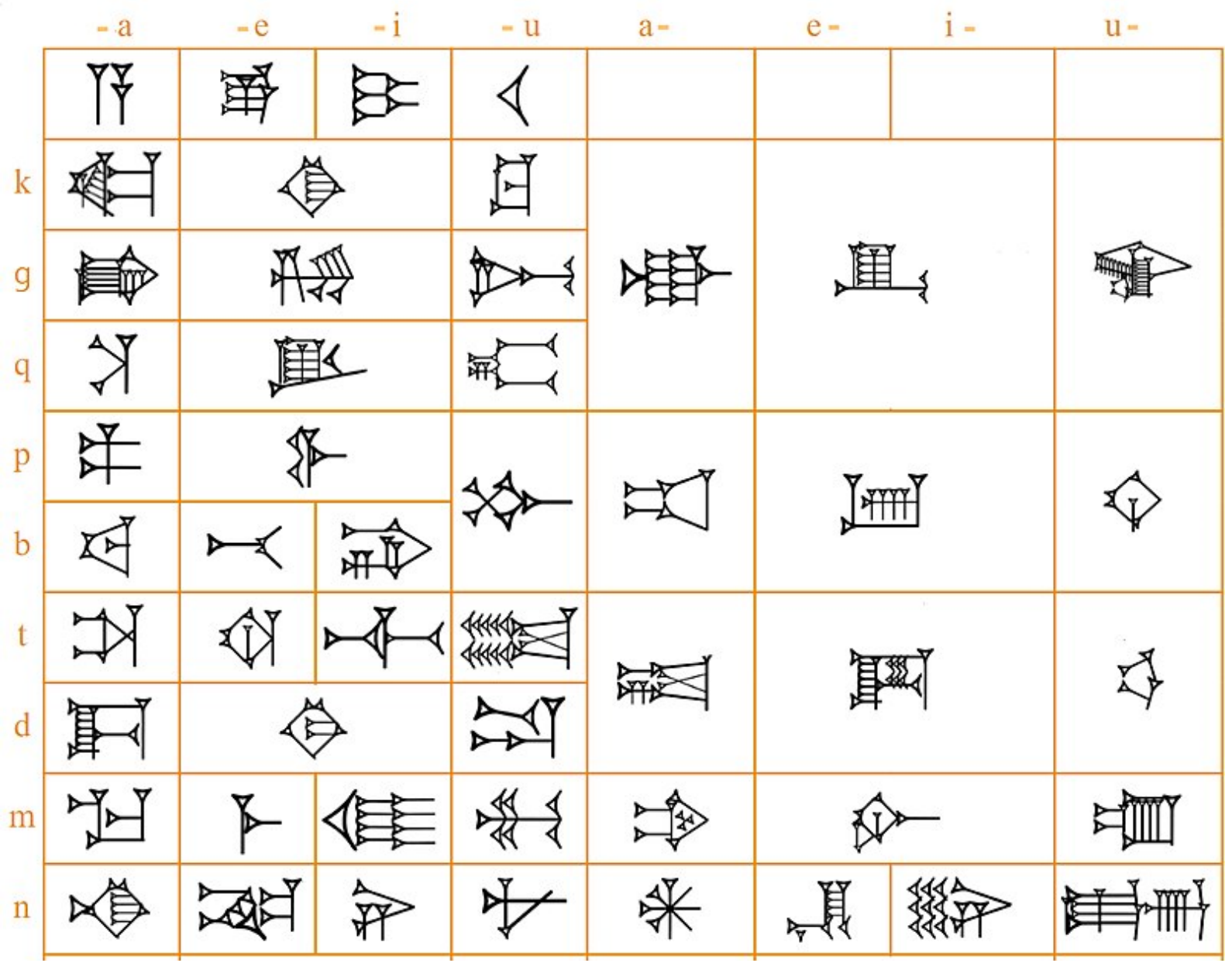
廣
guǎng

申
shēn

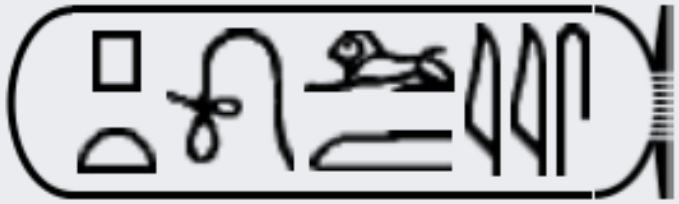


神
shén

Mesopotamian Cuneiform (Syllabary)



Egyptian Hieroglyphs (Alphabet)



P	T	O	L	M	E	S

K	L	E	O	P	A	T	R	Feminine ending

Origin of European alphabets

Hieroglyph	Proto-Sinaitic	IPA value	Reconstructed name	Phoenician	Archaic Greek	Roman
		/ʔ/	ʾalp "ox"			A
		/b/	bayt "house"			B
		/g/	gaml "throwstick"			C
		/d/	dag "fish"			D

Types of Writing system

1. **Picto**gram: ***picture*** writing, e.g. Chinese 日 "sun" & 月 "moon"
2. **Ideo**gram: ***concept*** writing, e.g. Chinese 上 "up" & 下 xià "down“, or Chinese 明 “bright” < 日 "sun" + 月 "moon"
3. **Logo**gram: ***word*** writing, e.g. Chinese 我 “I“ & 你 "you"
4. **Phono**gram: ***sound*** writing = most writing systems in current use around the world

In actual writing, Pictogram & Ideogram can be considered a form of Logogram: the picture & the abstract sign stands for actual word

Example of Logogram

青森

ao-mori

Greenwood

牛若丸

ushi-waka-maru

源 義経

minamoto no yoshi-tsune

Types of Phonogram

- Syllabary – ***syllable*** writing
- Semi-syllabary – ***half the syllable*** writing
- Alphasyllabary – consonant writing with vowel diacritics
- Abjad – **consonant** writing without vowel
- Alphabet – **segment**/phoneme writing

- Grapheme = the smallest **functional** unit of a writing system
  - Coined in a similar manner to phon-eme, morph-eme

Diagnosis of a grapheme

Each symbol in a writing system is referred to as *graph/glyph:*

Thai เ, when used alone = grapheme for /e:/

Thai า , when used alone = grapheme for /a:/

When the two graphs are used together, we get เา grapheme for /aw/

Allographs

- 2 graphs expressing the same phoneme:
- German eu & äu = /ɔʏ/, eu & äu = allographs
- German ei & ai = /aj/, ei & ai = allographs
- German e & ä = /ɛ/, e & ä = allographs
- Greek η, ι, υ, ει, οι, υι = /i/, η, ι, υ, ει, οι, υι = allographs
- Thai ไ & ใ = /aj/, ไ & ใ = allograph

Syllabary

one grapheme per syllable

Hiragana
(Japanese Syllabary)

みなもと の よしつね
Mi-na-mo-to no Yo-shi-tsu-ne

Yi script
(Nuosu Syllabary)

[nɔ̄.sū bṵ.mā]

Semi-Syllabary

one, two, or more graphemes per syllable

粲	汆	千	全
ㄘㄢˋ	ㄘㄨㄢ	ㄑㄧㄢ	ㄑㄩㄢˊ
/tsh-an/	/tsh-u-an/	/tshi-i-an/	/tshi-y-an/
[tshan]	[tshuan]	[tɕhjɛn]	[tɕhɥɛn]

此	ㄘˇ	乞	ㄑㄧˇ
	/tshɨ/		/tshi-i/
			[tɕhi]

Alphasyllabary

1. consonant graphemes contain an **inherent vowel** (usually /a/)
2. other vowels are expressed through modification of the based consonant, usually in a form of diacritics

के
/ke/

कि
/ki/

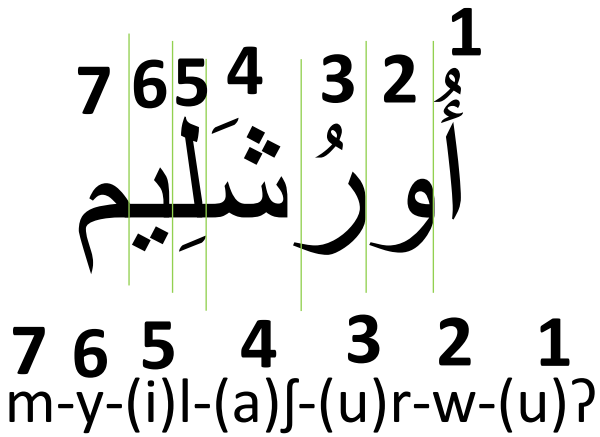
क
/ka/

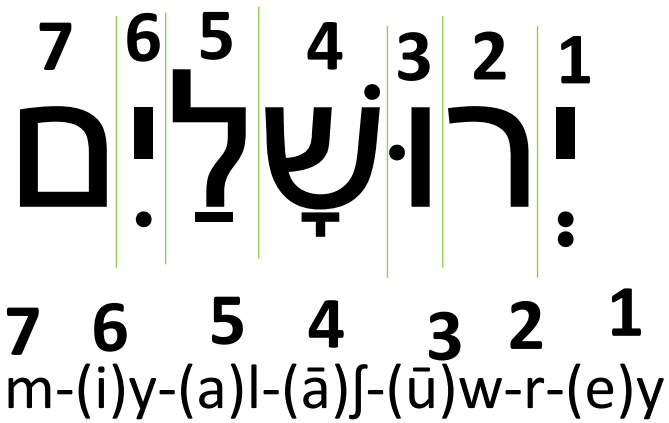
को
/ko/

कु
/ku/

Abjad

- Usually lack explicit indication of vowel sounds and only consonants are written. Though, vowel might be expressed in a form of diacritics





Abjad vs Alphabsyllabary

If both are consonant-prominent, then what's the difference?

: indicating vowel is mostly **optional** in Abjad!!!,

but **obligatory** in Alphasyllabary!!!

Alphabet

one symbol per phoneme = distinct graphemes for both consonant and vowel sounds

Greek Alphabet

Ελληνικό

/el.li.ni.ko/

[eʎiɲiˈko]

Cyrillic Alphabet

кириллица

/ki.ril.li.tsa/

[kʲɪˈrʲilʲɪtsə]

Digraph
(2 graphs grapheme)

- English sh /ʃ/
- English ch /t͡ʃ/
- English th /θ/ & /ð/
- Albanian xh /d͡ʒ/
- Albanian zh /ʒ/

Biphonemic Grapheme

- English x /ks/ & /gz/
- Greek ξ /ks/
- Greek ψ /ps/

Phoneme vs Segment

- English ***j*** & Turkish ***c*** = /d͡ʒ/
- Cyrillic ***ч*** & Turkish ***ç*** = /tʃ/
- Cyrillic ***ц*** & German ***z*** = /ts/
- These phonemes are *affricates*, usually expressed by two IPA symbols

Ligature

- Combined/Blended graphemes, whose components may or may not be recognisable

German **ß** /ss/ < **ſ** /s/ + **s** /s/ (recognisable)

Devanagari क्ष /kʃ/ < क /k/ + ष /ʃ/ (unrecognisable)

Underrepresentation of Sounds

Spanish		
Grapheme	Initially or After nasal	Between vowels or finally
g	/g/	[ɣ]
d	/d/	[ð]
b	/b/	[β]

English th = both /θ/ & /ð/

	Before a,o,u	Before i,e,y
English & French **c**	/k/	/s/
Italian **c**		/tʃ/
English & Italian **g**	/g/	/d͡ʒ/
French **g**		/ʒ/
German ch	/x/ [χ]	/x/ [ç]

Recognising the type of script

- The **ratio** between syllables/segment per grapheme

  Non phonogram for polysyllabic language :

  abundantly more syllables than graphemes

  Non phonogram for monosyllabic language:

  one syllable (one word) per grapheme as well

Recognising the type of script

- The ratio between syllables/segment per grapheme
- Syllabary: (usually) **equal** amount of **syllables and graphemes**
- Semi-Syllabary: 1-4 graphemes per syllable
- Alpha-syllabary: **equal** amount of **segment/phonemes** and **graphemes, vowels = diacritics around a consonant**
- Alphabet: (usually) **equal** amount of **segment/phonemes** and **graphemes, vowels ≠ diacritics**
- Abjad: **equal** amount of **consonants and graphemes**

Luwian

1. The following are the inscriptions that correspond to these names. Your job is to match each inscription with the name that it represents. The process you use to solve this puzzle is very similar to what archeological linguists actually do when they discover writings and inscriptions in unknown languages.

1. 

2. 

3. 

4. 

5. 

6. 

Regions: Khamatu, Palaa.
Cities: Kurkuma, Tuvarnava.
Kings: Varpalava, Tarkumuva.

Recognising the type of script

- Count the number of the syllables, segments, and graphemes

1.  5

2.  4

3.  5

4.  4

5.  5

6.  4

Regions: Khamatu, Palaa.	(6)3, (5)3
Cities: Kurkuma, Tuvarnava.	(7)3, (9)4
Kings: Varpalava, Tarkumuva.	(9)4, (9)4

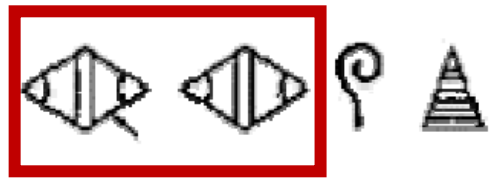
Recognising the type of script

- Cannot be non-phonogram: too many graphemes
- Cannot be alphabet: too few graphemes
- Cannot be semi-syllabary: the ratio between syllables and grapheme = almost one to one
- May be alphasyllabary, syllabary, or abjad

Observable Recurring patterns

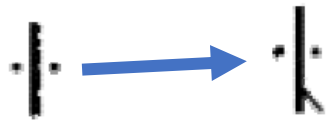
- Only 3 word-final graphemes 
- However! 1 final –tu, 1 final –a, 1 final –ma, 3 final –va
- Possibly a pictogram, indicating categories: King, Cities, Regions

Observable Recurring patterns

2.  **Kur-ku**-ma-city

Syllable with –r → Base Grapheme

Syllable without -r → Base Grapheme + a stroke



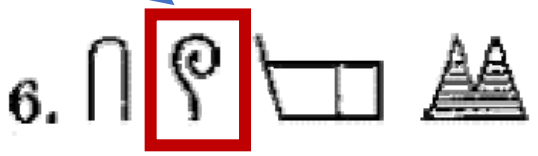
va var

Normal grapheme =
open syllable syllabogram

Additional stroke indicates final -r

5. 

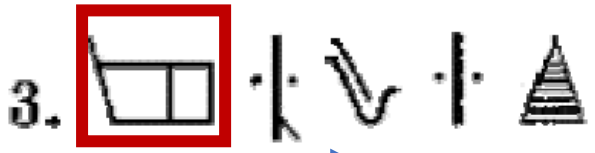
Tar-ku-mu-va-King

6. 

Kha-ma-tu-Region

1. 

Var-pa-la-va-King

3. 

Tu-var-na-va-City

Observable Recurring patterns

- Ideogram: King  city  region 

1. 
Var-pa-la-va-King

2. 
Kur-ku-ma-City

3. 
Tu-var-na-va-City

4. 
Pa-la-a-Region

5. 
Tar-ku-mu-va-King

6. 
Kha-ma-tu-Region

2. Now, the next step is to use what you have just learned to determine what the Luvian inscription would probably be for each of the following names:

Kings: Parta Armura

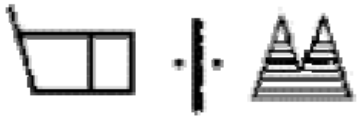
Regions: Tarmu Tuva Narva

King Par-ta

King Ar-mur-a

Tar-mu Region

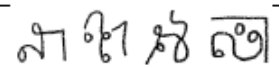
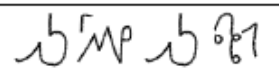
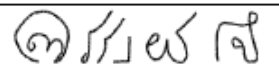
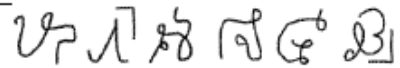
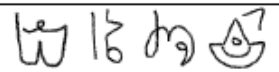
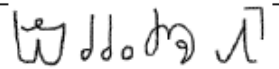
Tu-va Region

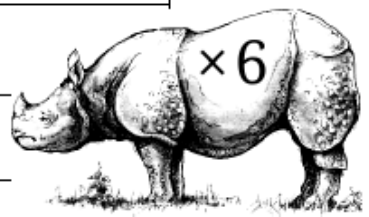


Nar-va Region

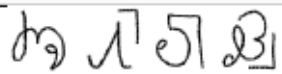
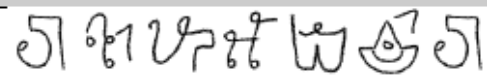
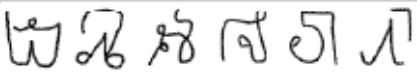
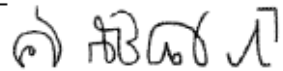
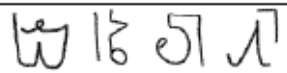
Khom Laven

Problem 4 (20 points). Here are some word combinations in Laven written in the Khom script and in phonetic transcription and their English translations:

1		**praj trie**	*to wake up the wife*
2		**caːk caj**	*from the heart/mind/soul*
3	?	**taw bɛː**	*to see the raft*
4		**kriət blaw**	*to scratch the thigh*
5		**plaj priət**	*banana*
6	?	?	*three bananas*
7		?	*six rhinoceros*
8		?	*four hands of bananas*
9		?	*?*
10	?	**cie pʌh laː**	*seven sheets of paper*



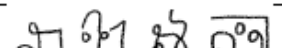
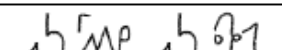
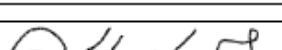
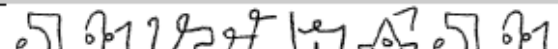
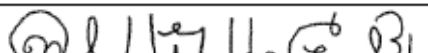
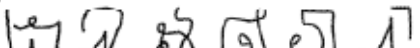
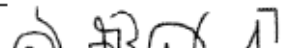
Khom Laven

11		?	*aubergine/eggplant leaf*
12		?	*two aubergines/eggplants*
13		**plaj hnat pʌh plaj**	*seven pineapples*
14		**kruat pɛː toː**	*three bees*
15		**laː prɨət traw laː**	*?*
16	?	**kəːr bəːr toː**	*two doves*
17		**blaːk puan kaː**	*four carp*
18		**piet traw plaː**	*six knives*
19		**bəːr kaː**	*?*
20		?	*four blades*

4 ×

Fill in the gaps.

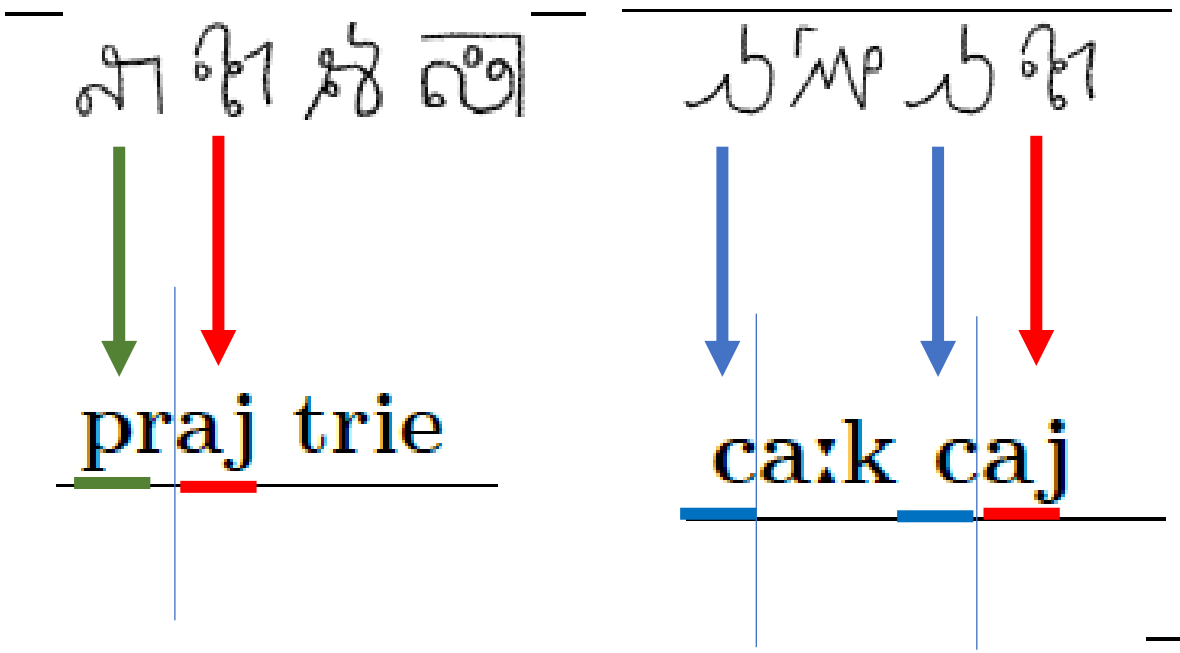
Ratio of grapheme : syllables/segments

1		praj trie
2		caːk caj
4		kriət blaw
13		plaj hnat pʌh plaj
14		kruat pɛː toː
18		piet traw plaː
19		bəːr kaː

Graphemes	Syllable	Segment
4	2	8
4	2	6
4	2	9
8	4	15
6	3	9
6	3	11
4	2	5

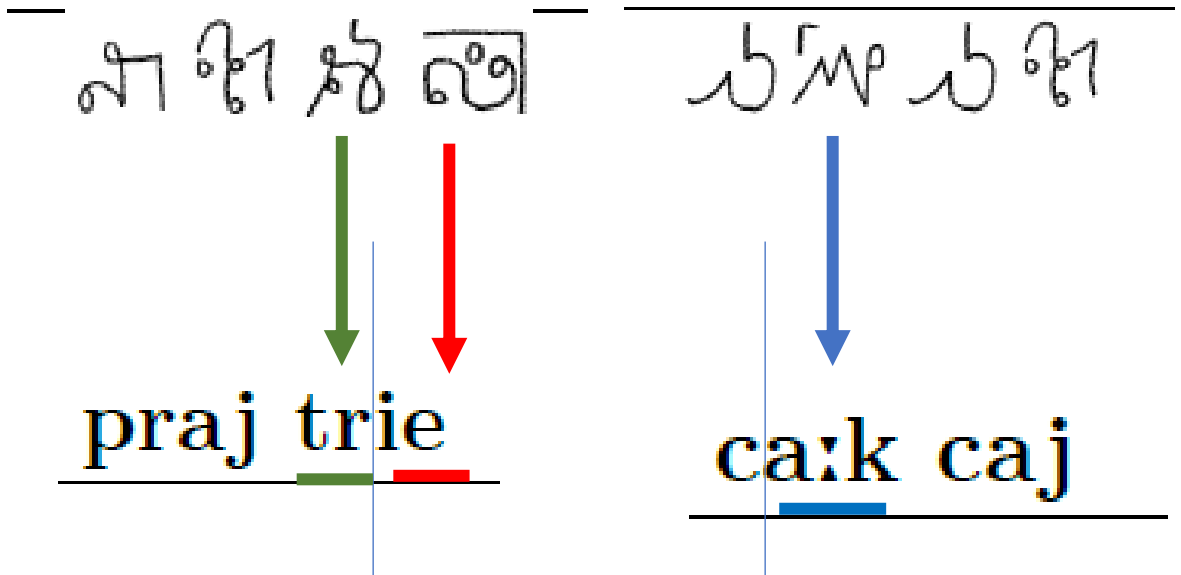
2 grapheme per syllable = semi-syllabary

What do graphems encode?



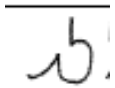
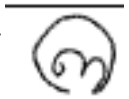
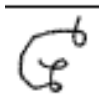
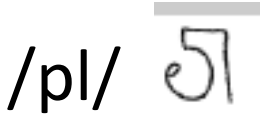
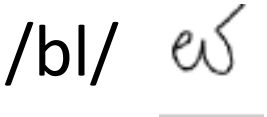
Either initial (simple of cluster)
And rime (vowel(s) + final)

thus

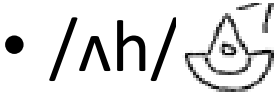


Identifiable Graphemes

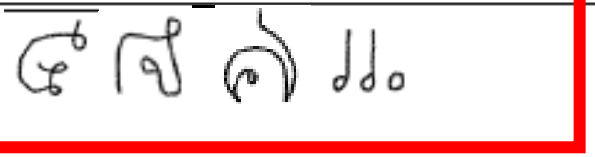
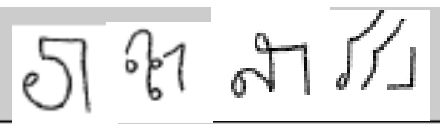
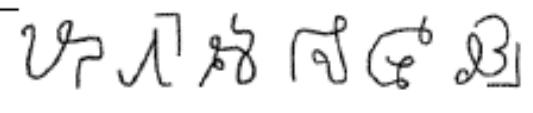
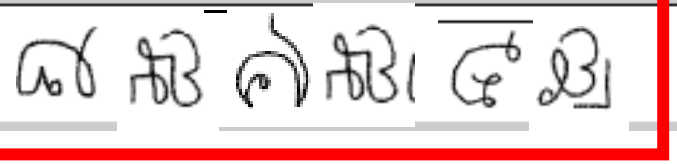
Graphemes for Initials

- /c/ 
- /k/ 
- /kr/ 
- /t/ 
- /tr/ 
- /p/ 
- /pr/ 
- /pl/ 
- /b/ 
- /bl/ 
- /hn/

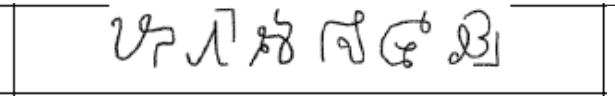
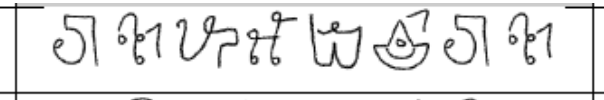
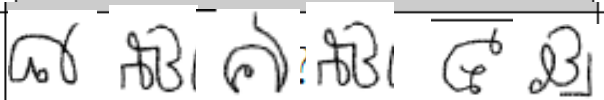
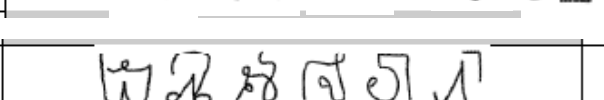
Graphemes for Rimes

- /a:/ 
- /a:k/ 
- /aj/ 
- /aw/ 
- /at/ 
- /uat/ 
- /ʌh/ 
- /ɛ:/ 
- /o:/ 
- /ie/ 
- /iet/ 
- /ə:r/ 
- /ɨət/ 

Filling the Gaps

3		taw bɛː	*to see the raft*
5		plaj prɨət	*banana*
7		/hna: traw to:/	*six rhinoceros* 
16		kəːr bəːr toː	*two doves* 

Current clues on lexicon & syntax

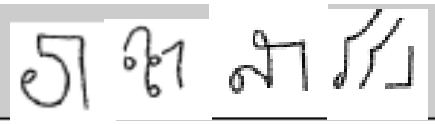
7		/hna: traw to:/	*six rhinoceros*
13		**plaj hnat pʌh plaj**	*seven pineapples*
14		**kruat pɛː toː**	*three bees*
16		**kəːr bəːr toː**	*two doves*
18		**piet traw plaː**	*six knives*

/hnat/ = pineapple
/kruat/ = bee
/piet/ = knife
/hna:/ = rhinoceros
/kə:r/ = dove

/to:/ = noun classifier for animals
/plaj/ = fruit & classifier for fruit
/pla:/ = classifier for knife
/bə:r/ = 2, /pɛ:/ = 3, /traw/ = 6, /pʌh/ = 7

NP + Numeral + Classifier

Filling the Gaps

5		**plaj prɨət**	*banana* (fruit)

NP + Numeral + Classifier

/plaj/ = fruit & classifier for fruit
/pɛ:/ = 3
/priet/ = banana fruit

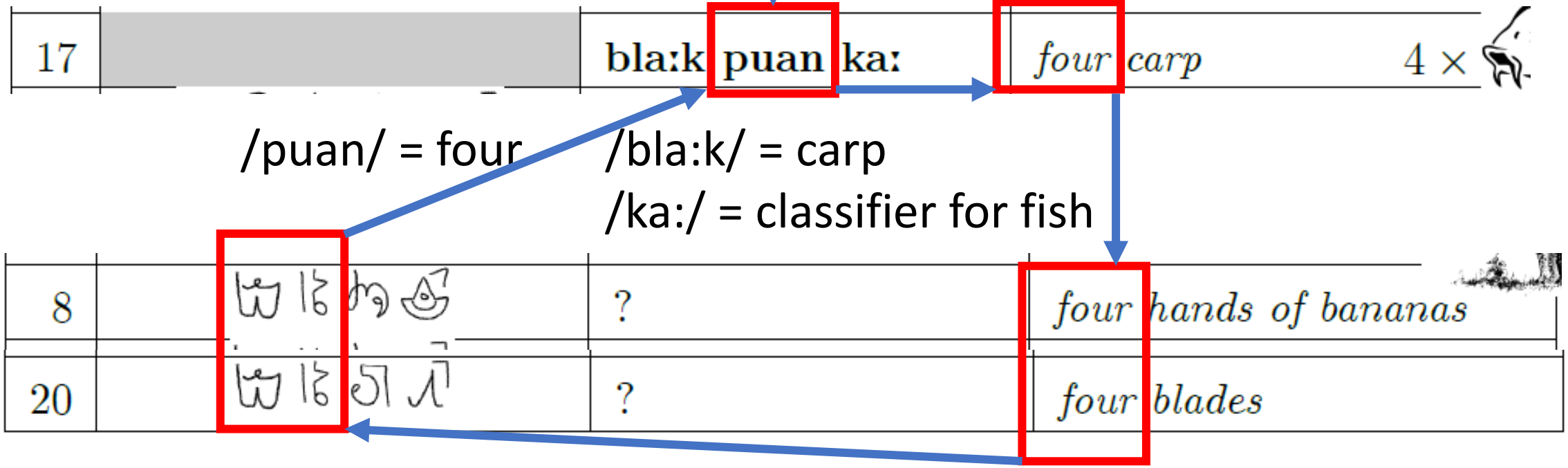
6		/plaj prɨət pɛ: plaj/	*three bananas*

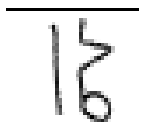
New syntax discovered: compound noun = Head Noun – Attributive Noun

plaj prɨət = fruit banana > banana fruit

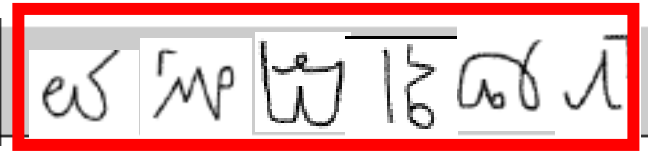
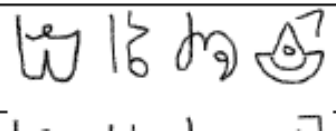
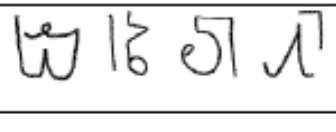
Finding number ‘4’

NP + Numeral + Classifier



added Identifiable Graphemes:  = /uan/

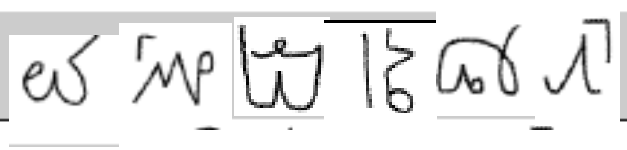
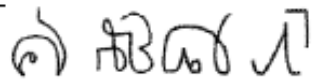
Filling the Gaps

17		**bla:k puan ka:**	*four carp* 
8		? /puan _?_ʌh/	*four hands of bananas*
20		? /puan pla:/	*four blades*

/pla:/ = blade

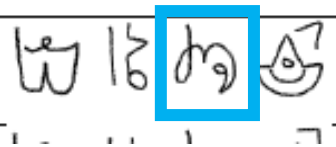
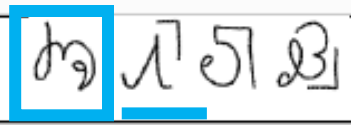
/_?_ʌh/ = banana hand

Filling the Gaps

17		**bla:k puan ka:**	*four carp* 4 × 
19		**bə:r ka:**	Two fish (species unspecified)

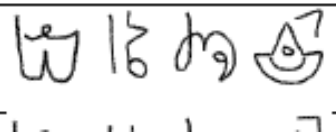
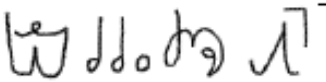
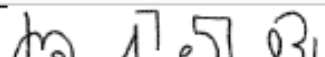
/bla:k/ = carp, specifically
/puan/ = 4
/ka:/ = Classifier for fish, fish
/bə:r/ = two

Filling the Gaps

8		? /puan _?_ʌh/	*four hands of bananas*
9		? /pɛ: _?_a:/	three ???
10		**cie pʌh la:**	*seven sheets of paper*
11		? /_?_a: plo:/	*aubergine/eggplant leaf*

Mostlikely,  = /l/

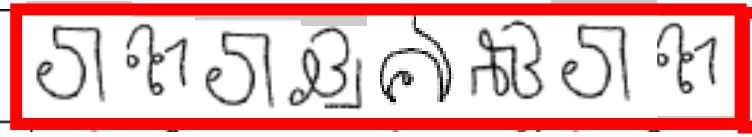
Filling the Gaps

8		? /puan lʌh/	*four hands of bananas*
9		? /pɛ: la:/	three leaves/sheets
10		**cie pʌh la:**	*seven sheets of paper*
11		? /la: plo:/	*aubergine/eggplant leaf*

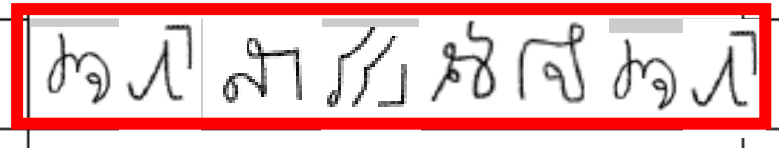
/lʌh/ = Banana hand
/cie/ = paper
/plo:/ = eggplant
/la:/ = leaf/sheet, **Classifier for sheet like object**

Filling the Gaps

/plaj/ = fruit/product of plant & Classifier for such objects
/bə:r/ = two
/plo:/ = eggplants

12		/plaj plo: bə:r plaj/	*two aubergines/eggplants*

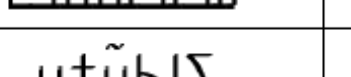
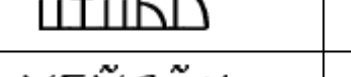
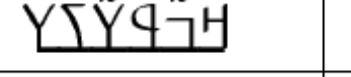
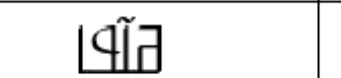
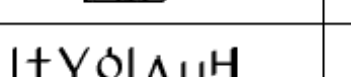
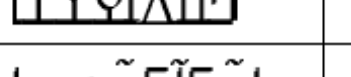
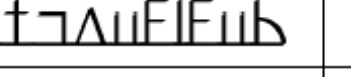
/prɨət/ = Banana (plant species, not the fruit/product!)
/traw/ = six
/la:/ = leaf/sheet, Classifier for sheet like object

15		la: prɨət traw la:	?	six banana leaves

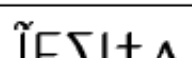
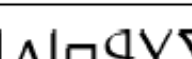
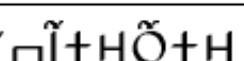
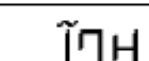
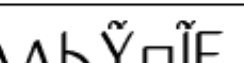
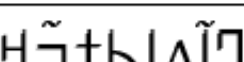
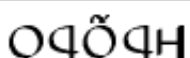
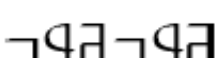
Nko

Problem #2 (20 points). The following are words of the Maninka and Bamana languages written in the N'Ko and the Roman script and their English translations:

(a)

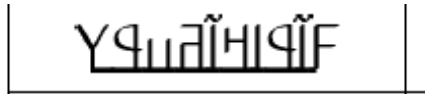
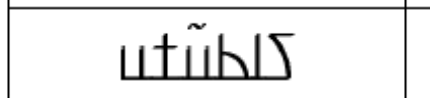
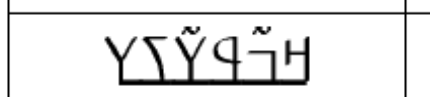
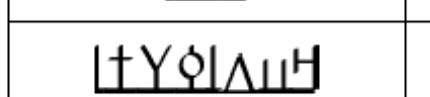
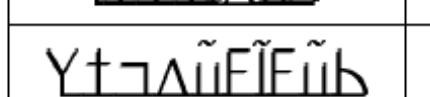
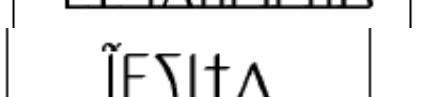
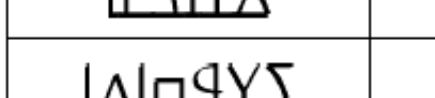
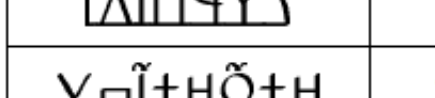
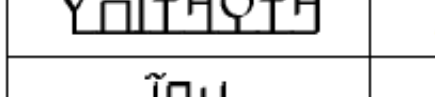
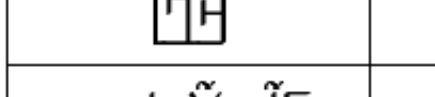
	**bàlákàwúli**	unexpectedness; sandgrouse (a kind of bird)
	**játùrú**	hyena
	**kòlijí**	washing water
	**wàlá**	slate
	**kúmayira**	advertising
	**tùbabumóri**	Christian priest
	?	uncircumcised boy
	?	match-seller
?	**kòrikóri**	rust
?	**báwò**	because

(b)

	**márajàba**	hail!
	**jílasama**	hippopotamus
	**kɔ̀rɔkarasí**	gerontocracy
	**kàna**	may it be that
	**bàsitémɛ**	wide-meshed sieve
	**nàmátòrokó**	hyena
	?	rainbow
	?	light (of a lamp)
	?	a kind of midges; honey from such midges
?	**jàmanaké**	the joys, pleasures of youth
?	**létɛrɛ**	letter, missive
?	**bìlakóro**	uncircumcised boy

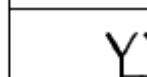
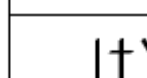
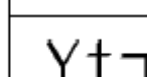
Fill in the gaps.

Current clues

	**bàlákàwúli**	unexpectedness; sandgrouse (a kind of bird)
	**játùrú**	hyena
	**kòlijí**	washing water
	**wàlá**	slate
	**kúmayira**	advertising
	**tùbabumóri**	Christian priest
	**márajàba**	hail!
	**jílasama**	hippopotamus
	**kɔ̀rɔkarasí**	gerontocracy
	**kàna**	may it be that
	**bàsitɛ́mɛ**	wide-meshed sieve
	**nàmátòrokó**	hyena

Graphemes : Syllable/Segment ratio

Maninka

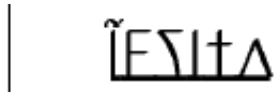
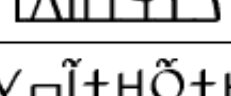
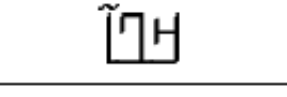
	bàlákàwúli
	játùrú
	kòlijí
	wàlá
	kúmayira
	tùbabumóri

Grapheme	Syllable	Segment
10	5	10
6	3	6
6	3	6
4	2	4
8	4	8
10	5	10

Equal number of graphemes and phonemes in Maninka suggest an ***alphabetic*** writing system

Graphemes : Syllable/Segment ratio

Bamana

	márajàba
	jílasama
	kɔ̀rɔkarasí
	kàna
	bàsitɛ́mɛ
	nàmátòrokó

Grapheme	Syllable	Segment
6	4	8
7	4	8
8	5	10
3	2	4
7	4	8
9	5	10

However though, one or two less graphemes than segments in Bamana suggests some sort of underrepresentation of vowel graphemes

Reading direction

The script reads from right to left

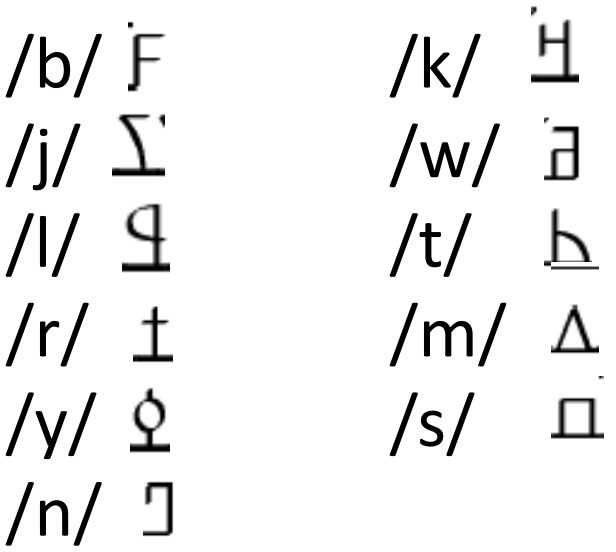
	kúmayira
	kàna
	kɔ̀rɔkarasí
	kòlijí

Recognisable graphemes

Vowels

	Front	Central	Back
High	i		u
High-mid			o
Low-mid	ɛ		ɔ
Low		a	

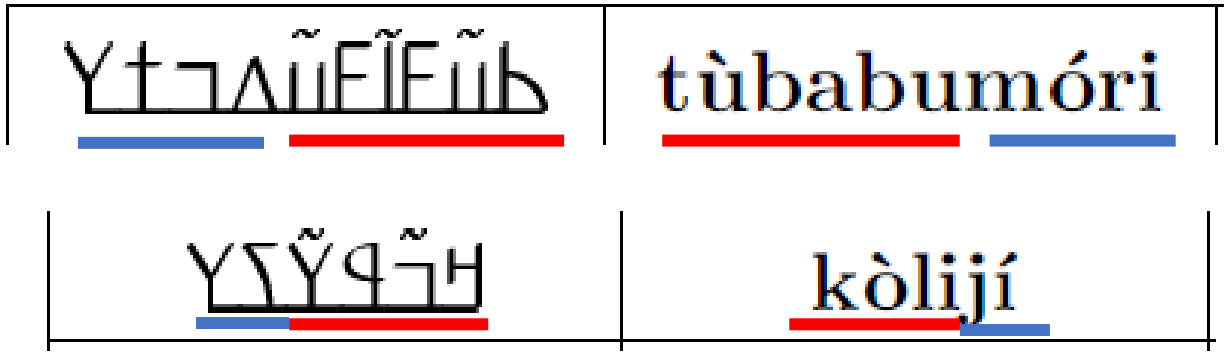
Consonants



◌̃ Low tone

How does tone marking work?

1. High tone is automatically assigned to unmarked syllable (marked with an acute accent in IPA)
2. Low tone is assigned to syllable with the tone marker (marked with a grave accent in IPA)
3. In a sequence of syllables with the same tone, the tone from the second syllable onwards will be turned into a neutralized tone (unmarked in IPA) unless marked as the other tone



Vowel omission in Bamana

- In a sequence of syllables with the same vowel, only one vowel grapheme is required to be written at the very end of the sequence.

	kɔ̀rɔkarasí	gerontocracy

- However, if they differ in tone, the same vowel grapheme cannot be shared between the two syllable.

	márajàba

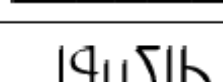
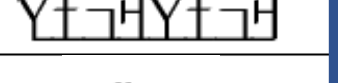
How does tone marking work?

As per vowel omission in Bamana, the tone marking is placed on the only vowel grapheme. As per the third principle, the second of the two syllable always has the neutralized tone.

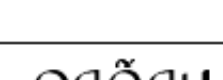
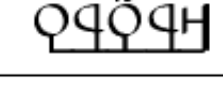
	márajàba

Fill in the gaps

Maninka

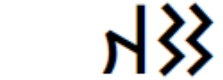
	kɔ̀lɔlɔ́	uncircumcised boy
	tájula	match-seller
	kòrikóri	rust
	báwò	because

Bamana

	bìlákòró	rainbow
	támɛnɛ	light (of a lamp)
	wólowolo	a kind of midges; honey from such midges
	jàmanaké	the joys, pleasures of youth
	létɛrɛ	letter, missive
	bìlakóro	uncircumcised boy

Old Turkic

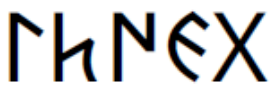
Problem 5 (20 points). Here are some Old Turkic words written in the Old Turkic script, their Roman transcriptions and their English translations:



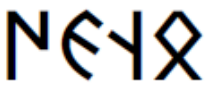
adaq *foot*

altun *gold*

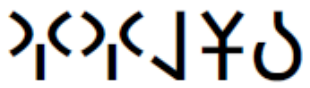
amtï *now*



ädgüti *well (adv.)*



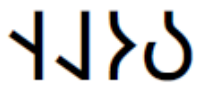
bäŋgü *eternal*



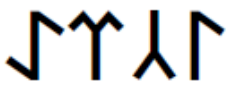
bašlïɣïɣ *the head-bearer, the arrogant one*

bilmäz *he/she does not know*

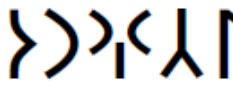
bodun *populace*



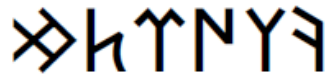
buluŋ *corner*



ičrä *inside*

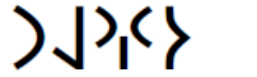


ïčɣïnu *after losing*



kälürtüm *I brought*

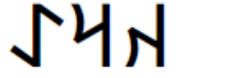
költä *at the lake*



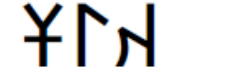
oɣlan *boy*

oɣlïtï *their sons*

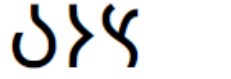
ölti *he/she killed*



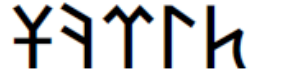
qara *black*



qïš *winter*

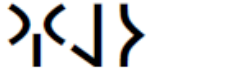


sub *water*

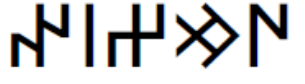


tirkiš *to go on in a sequence*

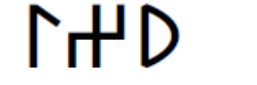
tölis *Tölis (personal name)*



uluɣ *great*



ümüzsän *you will not think*



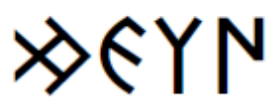
yazï *plains, field*

yügürti *it flowed*

(a) Write out in the Old Turkic script:

1.	_____	**ärän**	*men*
2.	_____	**bïčdï**	*he/she cut*
3.	_____	**könül**	*heart*
4.	_____	**otuz**	*thirty*
5.	_____	**qaγan**	*khagan*
6.	_____	**tizligig**	*the knee-bearer, the mighty one*

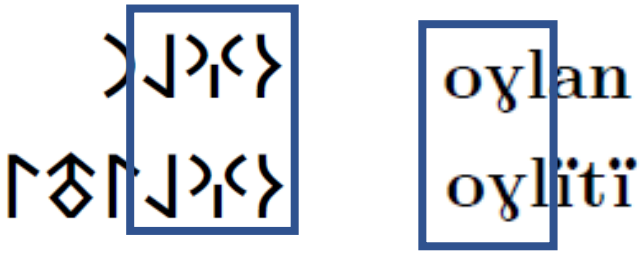
(b) Provide **all** possible Roman transcriptions of the following word:

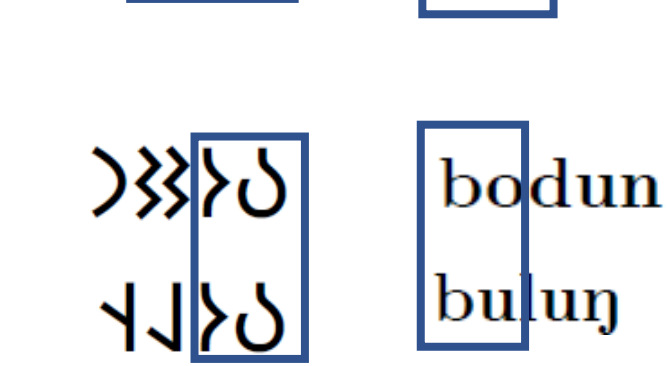


(c) Describe the spelling rules of the Old Turkic script.

Describe the spelling rules of the Old Turkic script.

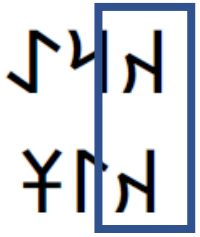
1. The script reads from right to left


oylan


oylïtï

bodun

buluŋ


qara

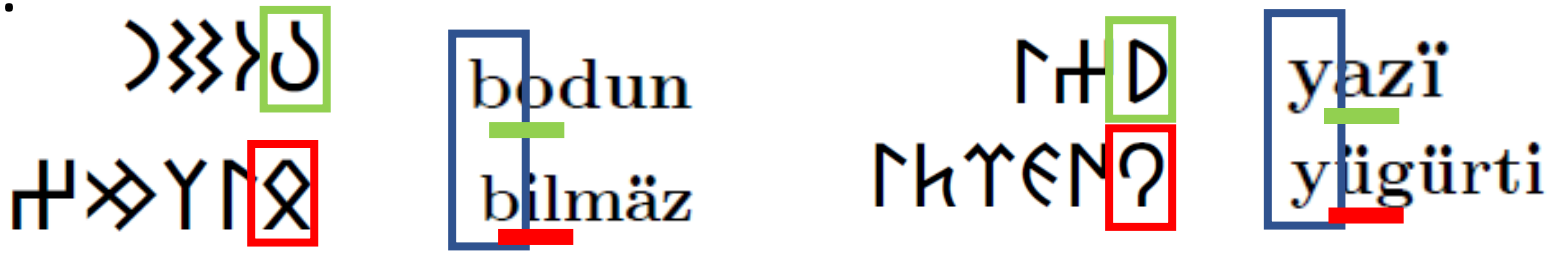

qïš

kälürtüm

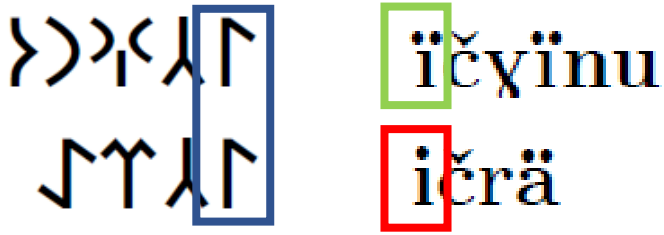
költä

Describe the spelling rules of the Old Turkic script.

- 2. Indication of vowel frontness/backness
- 2.1 Most consonant phonemes have two graphemes, one signaling/used with front vowels, another signaling/used with back vowels.



- 2.2 2 Vowel graphemes represent either front or back variant according to the governing consonants



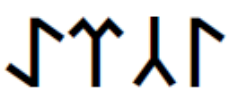
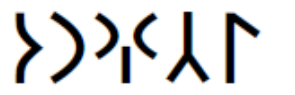
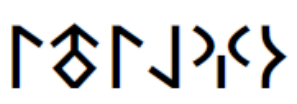
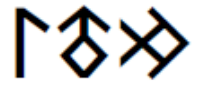
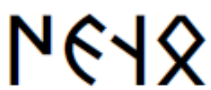
Describe the spelling rules of the Old Turkic script.

	Unrounded		Rounded	
	front	back	front	back
High	/i/	/ï/	/ü/	/u/
Low	/ä/	/a/	/ö/	/o/

Phoneme	Front	Back
/b/		
/t/		
/d/		
vl dorsal stop	/k/	/q/
vd dorsal stop	/g/	/ɣ/
/l/		
/r/		
/y/		
/n/		
/s/		
/z/		
/š/		
/č/		
/m/		
/ŋ/		

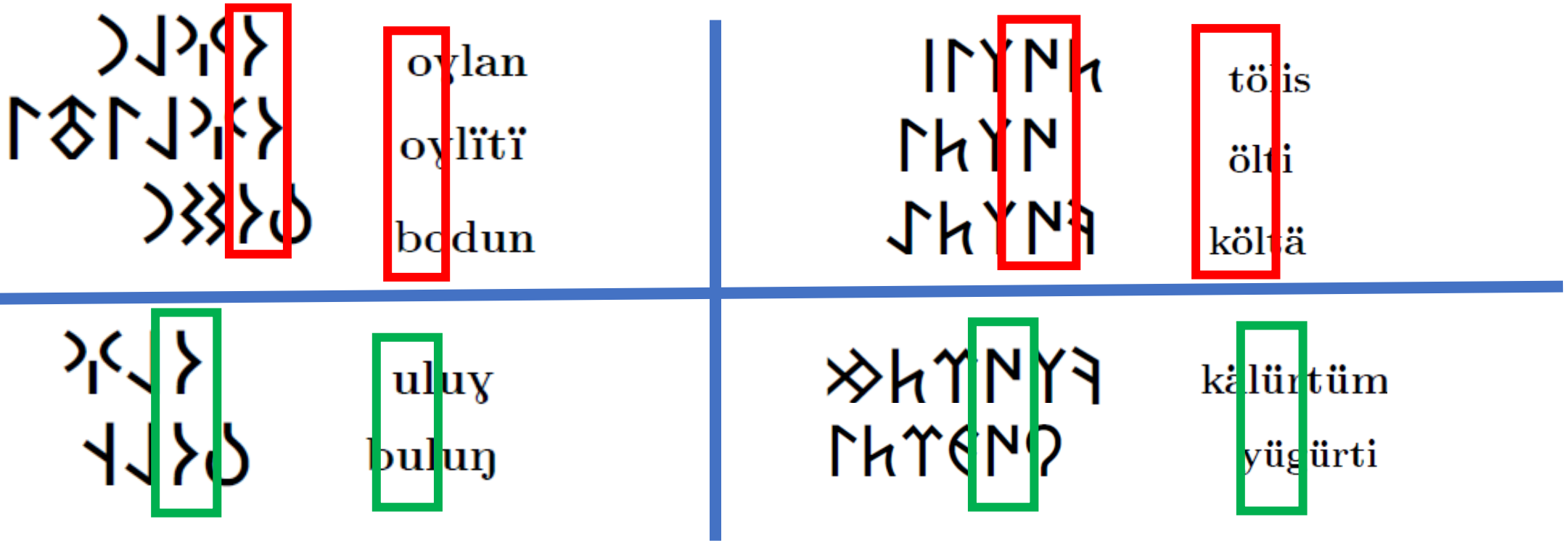
Describe the spelling rules of the Old Turkic script.

3. All the vowels within a single word must agree in frontness/backness: vowel harmony in “Central Asian Steppe” languages

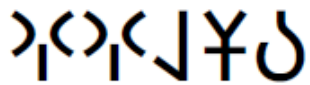
Front Vowels		Back Vowels	
	ičrä		ïčɣïnu
	költä		oɣlïtï
	ölti		amtï
	bäŋgü		bodun

Describe the spelling rules of the Old Turkic script.

4. /ö/ & /ü/ and /o/ & /u/ share the same grapheme due to limited distribution of /ö/ & /o/ : /ö/ & /o/ occur only in the first syllable.



Inconsistent use of vowel graphemes?

No vowel at all:  adaq  bašlïɣïɣ

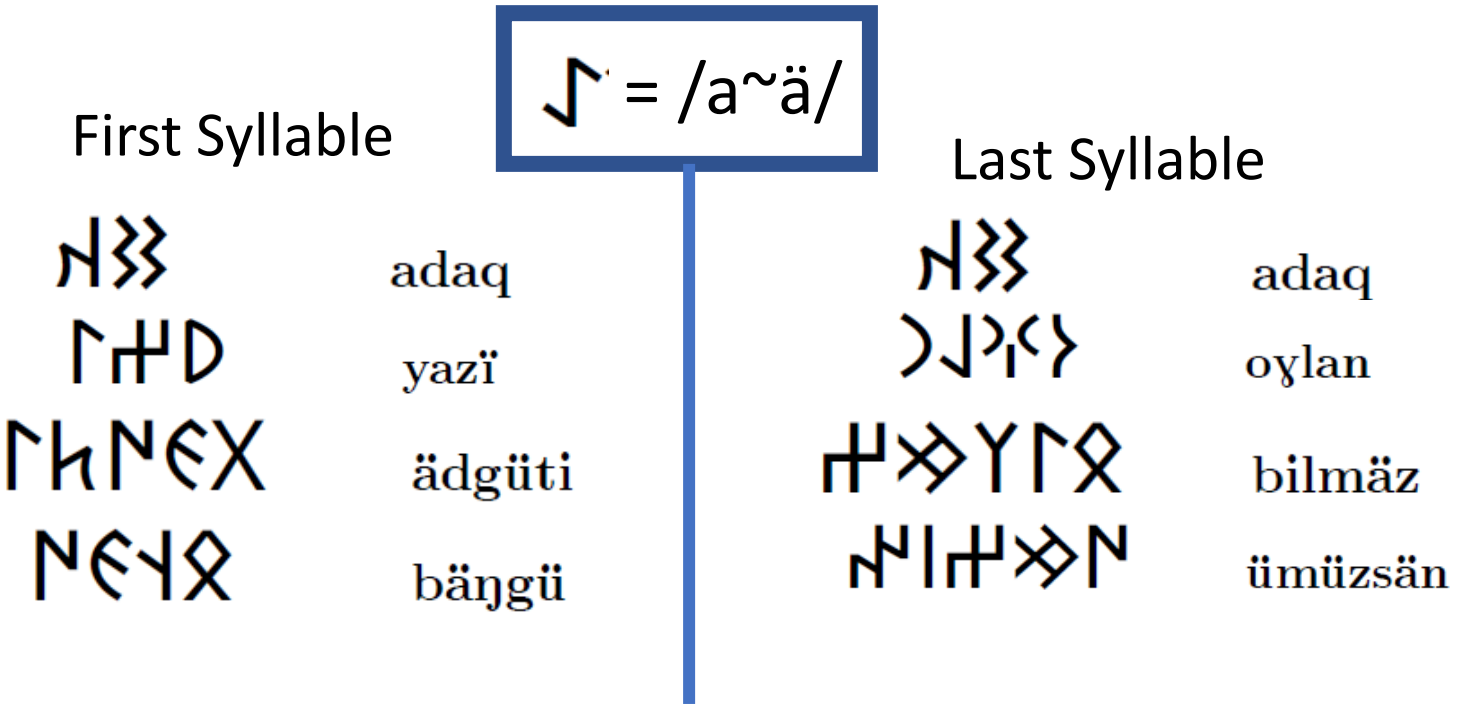
Some vowels are left out:  bodun  qara

All the vowels are present:  tölis  ölti

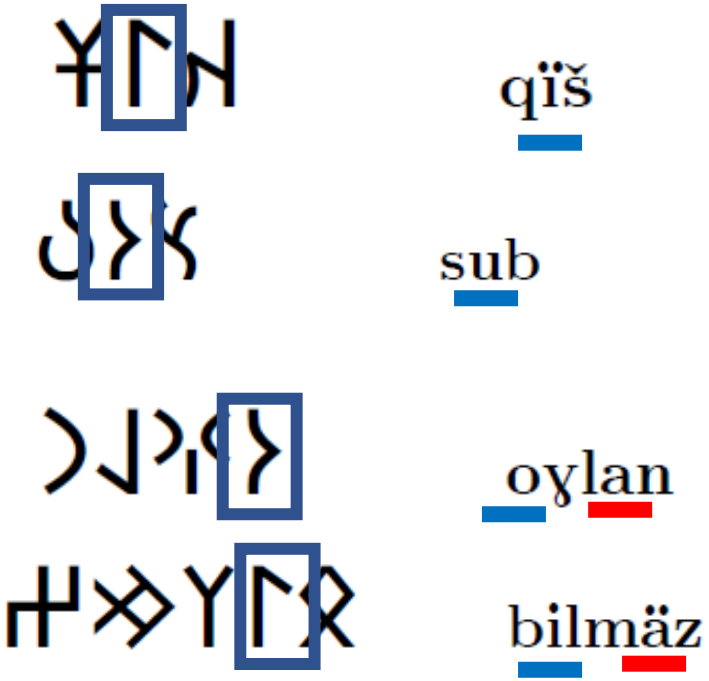
Since Old Turkic script was derived ultimately from Aramaic abjad, vowels are left out according to certain contexts (**4 Principles of Vowel Omission**)

Describe the spelling rules of the Old Turkic script.

Principle #1: The vowel /a~ä/ is not explicitly indicated in the first syllable (with or without an initial) or the last syllable (in closed syllable only).



Principle #2 All other vowels but /ä~a/ must be indicated explicitly:

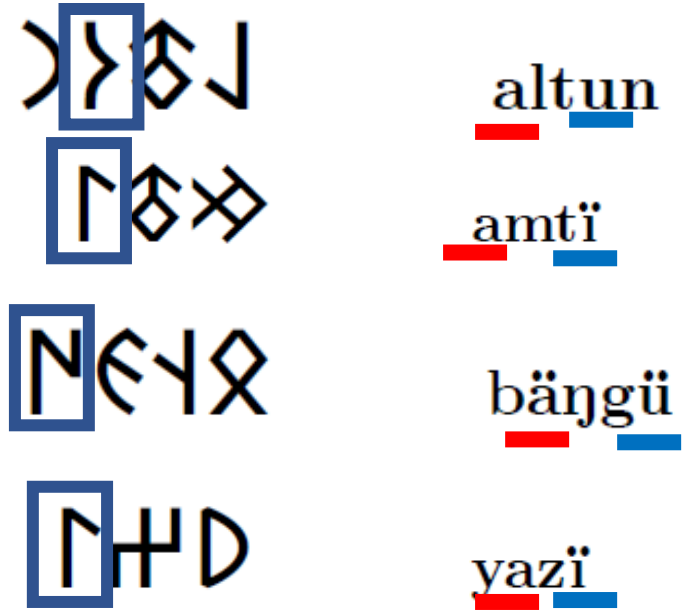


qïš

sub

oɣlan

bilmäz



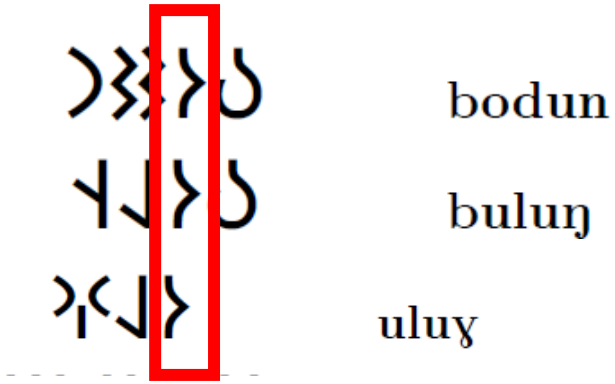
altun

amtï

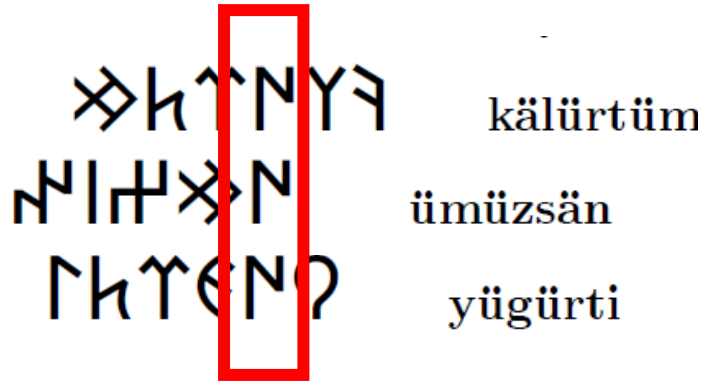
bäŋgü

yazï

Principle #3 If any two consecutive syllables contain the same vowel, only the vowel of for the first of the two syllables is needed to be indicated explicitly:



Only the first 𐰺 /u/ is required

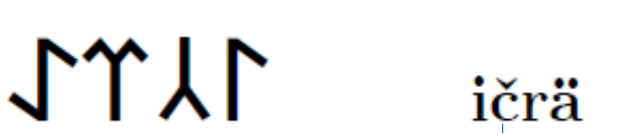


Only the first 𐰾 /ü/ is required

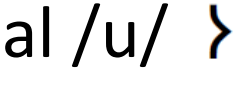
Only the first 𐰃 /i/ is required

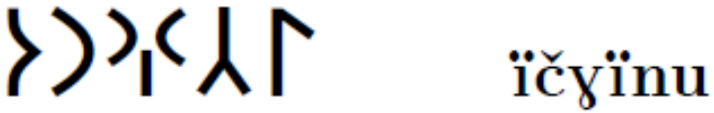
Principle #4: In words which end in a vowel (open syllable), that vowel must always be indicated explicitly:

Final /ä~a/ 

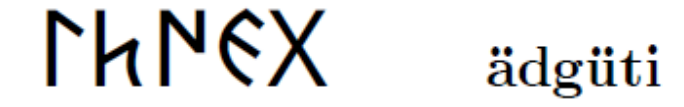


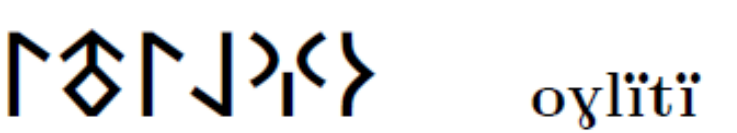
Final /ü/ 

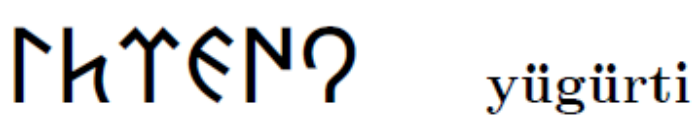
Final /u/ 



Final /i~ï/ 



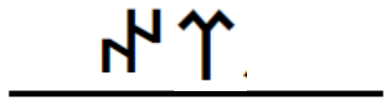
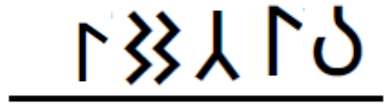
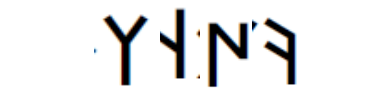
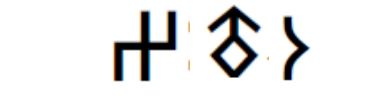
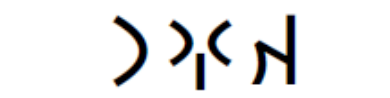
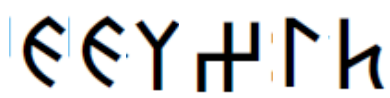




Principle #5: Word internal /i~ï/ after /ä~a/ may be omitted as well:

The only example:  bašlïɣïɣ

(a) Write out in the Old Turkic script:

1.		**äräṅ**	*men*
2.		**bïčdï**	*he/she cut*
3.		**köŋül**	*heart*
4.		**otuz**	*thirty*
5.		**qaɣan**	*khagan*
6.		**tizligig**	*the knee-bearer, the mighty one*

(b) Provide **all** possible Roman transcriptions of the following word:

ölägäm, ölägim, ölgäm, ölgüm, ölügäm, ölügüm,
ülägäm, ülägim, ülgäm, ülgüm, ülügäm, ülügüm.