

The Adaptation of Swahili Loanwords From Arabic: A Constraint-Based Analysis

by

Leonard Chacha Mwita, Ph.D.
chachamwita8@yahoo.com
Kiswahili Department, Kenyatta University

Abstract

This paper shows the processes that loanwords undergo when they are adapted from Arabic into Kihwahili. The data used is from Boshu (1993) and a constraint-based analysis is used in this paper. Although a number of studies have been carried out on Kihwahili loanwords, none that I know of has used Optimality Theory. This therefore makes the paper different from the others. Issues tackled herein include pitting the faithfulness of Kihwahili's open syllabicity (NOCODA) against the markedness of the sonority hierarchy (SON-SEQ) in borrowed words. For example, the paper discusses whether to maintain NOCODA when syllabifying "sultani" (chief, ruler, king) as /su.lta.ni/ or whether to look at the sonority of /l/ and /t/ vis-a-vis syllable margin (SON-SEQ) and thus syllabify it as /sul.ta.ni/. Occasionally in casual speech this is resolved by inserting a vowel between the consonants thus producing /su.lu.ta.ni/, but at other times prestige overrides well-formedness. Furthermore, this paper also shows that Kihwahili mainly uses vowel epenthesis to repair syllables but other procedures like consonant deletion, cluster tolerance and feature change are also used. It has also been confirmed that Kihwahili is susceptible to consonant clusters within syllables because of its long association with non-Bantu languages, mainly Arabic and English.

Introduction

This paper touches on two languages; Kiswahili and Arabic. Kiswahili is a Bantu language spoken by more than 80 million people mainly in East and Central Africa (Bosha 1993:45); while Arabic belongs to the Semitic group and is mainly spoken in the Middle East. There has been an interaction between Arabs and East Africans for hundreds of years leading to linguistic interferences on both sides. Though so, the most affected language between the two seems to be Kiswahili and the most affected domain of the language is phonology. Kiswahili has borrowed heavily from Arabic. Zawawi (1979:73) notes that “a collection and collation of loanwords in Johnson’s *Standard English-Swahili Dictionary* yielded a total of 3,006 words of foreign sources out of which 2,354 (80%) were of Arabic origin”.

This paper seeks to analyze how Kiswahili loanwords from Arabic have been nativized by the recipient language. I have replicated the data used here from Bosha (1993). A few words have been chosen (see Appendix) for the purpose of this analysis. In choosing the words, care was taken to include words with various types of syllables, for example, words that do not change phonologically, words with consonant clusters in the initial, mid and final positions, words with consonant geminates, vowel hiatus and long vowels.

The syllable, being a major component of phonological organization, will be the focus of this paper. The arrangement and rearrangement of the phonemes in the syllable in the recipient language will be explained by using constraints interaction. The purpose is to show how the recipient language repairs borrowed syllables coming into the word using constraints interaction.

Theoretical Background

The analysis in this paper is based on Optimality Theory whose central idea is that surface forms of a language reflect resolutions of conflicts between competing constraints. A surface form is “optimal” if it incurs the least serious violations of a set of constraints, taking into account their hierarchical ranking (Kager 1999). The following comprise the core principles of Optimality Theory:

- (a) Violability: Constraints are violable, but violation is minimal.
- (b) Ranking: Constraints are ranked on a language-particular basis; the notion of minimal violation is defined in terms of this ranking.
- (c) Inclusiveness: The constraint hierarchy evaluates a set of candidate analyses that are admitted by very general considerations of structural well-formedness.

In the analysis that follows, the following constraints are used:

*COMPLEX	=	no complex syllable margins
*COMPLEX ^{vow}	=	no strings of vowels
DEP-C	=	output consonants must have input correspondents (no C epenthesis)
DEP-IO	=	output segments must have input correspondents (no epenthesis)
IDENT-IO (F)	=	the specification for the feature of an input segment must be preserved in its output correspondent
IDENT-IO (place)	=	the specification for place of articulation of an input segment must be preserved in its output correspondent
MAX-IO	=	input segments must have output correspondents (no deletion)
MAX-V	=	input vowels must have output correspondents (no deletion of vowels)
NOCODA	=	syllables are open
ONSET	=	syllables must have onsets
PEAK	=	
SON-SEQ	=	complex onsets rise in sonority, and complex codas fall in sonority

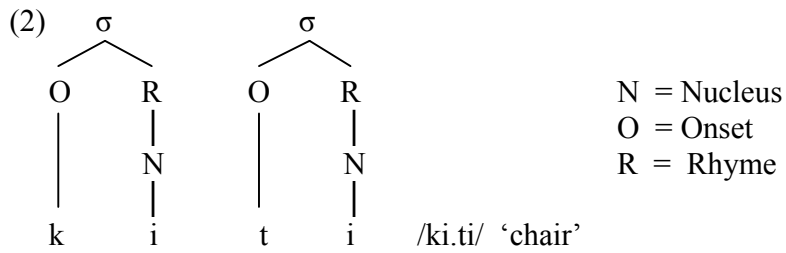
Before delving into the analysis, it is necessary to explain the kind of syllable structures found in Kiswahili language.

Kiswahili Syllable Structure

Kiswahili, just like other languages, has its words divided into syllables according to the principle of increasing sonority. The CV syllable is the most common in Kiswahili.

- (1) CV CV
/ k i . t i / 'chair'
/ f i . k a / 'arrive'
/ k a . t a / 'cut'

The first word can be represented by the following syllable tree.



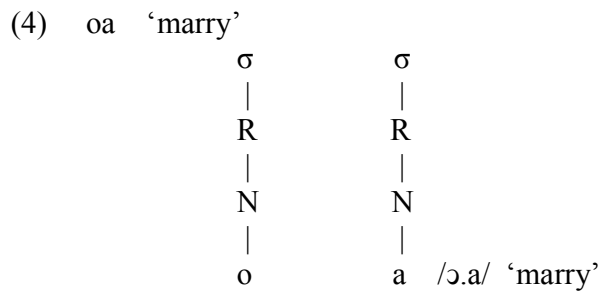
This syllable structure presupposes two faithfulness constraints: ONSET and NOCODA. Put on a tableau, this will look as follows:

Input: / kiti /	NOCODA	ONSET
a. \leftarrow ki.ti		
b. k.i.ti		*!
c. ki.t.i		*!
d. kit.i	*	*!


Also, Kiswahili has single vowel syllables. Examples of such syllables are:

- (3) oa /ɔ.a/ 'marry'
pia /pi.a/ 'also'
fua /fu.a/ 'wash' (like in washing clothes)

This shows that you can get one vowel syllable sequences in Kiswahili as illustrated in (4) below:



In terms of OT, we can use the following constraints to show this kind of syllabification: DEP-C, PEAK, and NOCODA.

Input: /ɔa/	PEAK	NOCODA	DEP-C
a.  ɔ.a			
b. ɔ.la			*!
c. ɔl.a		*!	*

Also, a preconsonantal nasal functions as a syllabic peak. The nasals that function as peaks in Kiswahili are /m/ and /n/. Examples are shown below:

- (5) mtu /m.tu/ ‘person’
 nne /n.nɛ/ ‘four’
 nchi /n.çi/ ‘country’

In syllabifying the above nasals as PEAKS we violate ONSET but avoid NOCODA violation. Using the first word /m.tu/, it is possible to show that sometimes syllable and morpheme boundaries coincide; for example, /m/ is a noun class prefix in singular form for people and animals while /tu/ is the root of the word that means ‘person’. The syllable therefore functions in the demarcation of morpheme edges and in defining the position and shape of affixes.

It is important to state that a number of scholars (Polome 1967:50; Myachina 1991:12; Mohammed 2001:11) have observed that Kiswahili has open syllables. This seems to suggest that there is NOCODA in Kiswahili syllables because the morphological structure of the language does not permit it. When loanwords are adapted into this language, it is difficult to maintain this position. The incorporation of loanwords into Kiswahili has resulted in an expansion of the Kiswahili syllabry, that is, it has increased the use of other syllable structures which are not very common in this language such as CCV and CCCV.

In that vein, we can say that another syllable structure that is found in Kiswahili is a cluster of two consonants with a vowel. This type is usually restricted to syllables with either a nasal as the first consonant or the approximants /j/ or /w/ as the second consonant. Here are examples of words:

- (6) ngamia /ŋga.mi.a/ ‘camel’
 mwezi /mwɛ.zi/ ‘moon’
 twanga /twa.ŋga/ ‘pound’

Although Kiswahili does not frequently have consonant clusters, when they occur they are to be found at the beginning of words or syllables. This is particularly common with the borrowed words. This shows that the language follows the principle of maximum onset and minimum coda.

Lastly, the language also has the syllable structure CCCV, mainly in borrowed words, where the first consonant is a nasal or the last consonant is an approximant /w/, for example:

- | | | | |
|-----|---------|-----------|-------------|
| (7) | chungwa | /čũ.ŋgwa/ | ‘orange’ |
| | ngwena | /ŋgwɛ.na/ | ‘crocodile’ |

The last two forms of syllables show that *COMPLEX is violated in Kiswahili because of the initial consonant cluster. Having seen the types of syllables found in Kiswahili, I will now proceed to show how loanwords are adapted into the language.

Syllable Repair Process

The idea of loanword adaptation or nativization at the phonological level is governed by syllable well-formedness in the recipient language. When a word is borrowed from one language to another, in most cases it violates some constraints of syllable well-formedness. The recipient language moves fast to fix the problem. For example, many languages try to avoid complex onsets and codas. The typical avoidance strategies that Kiswahili uses to repair the nonconforming syllables of the borrowed words are:

- (a) vowel epenthesis
- (b) consonant deletion
- (c) cluster tolerance
- (d) feature change

These procedures are pursued in more detail below with relevant examples.

Vowel Epenthesis

Batibo (1996:38) notes that this is by far the most common method of consonant cluster nativization in Kiswahili. It involves the insertion of a vowel between two consonants or after a consonant in a syllable final position. Epenthesis involves a violation of faithfulness because the epenthetic segment has no counterpart in the input. For example:

Input: asl
 Output: asili

/asl/ → asili

Input: / asl /	*COMPLEX	NOCODA	DEP-IO	ONSET
a. asl	*!	*		*
b. a.sil		*!	*	*
c. a.si.li			* *	*
d. as.i.li		*!	* *	* *

Although Polome (1967) and Batibo (1996) acknowledge the existence of consonant clusters at the onset of borrowed words and give examples like *stempu* /stɛ.mpu/ ‘stamp’ and *stovu* /sto.vu/ ‘stove’, I did not get any such examples of word initial onset consonant cluster in the data. Also, procedurally we know that an epenthetic vowel breaks up clusters of two consonants at the beginning of a word, as well as clusters of three consonants in medial position. A medial cluster of two consonants is not broken up by epenthesis, as this can be split between two syllables without the need for a complex margin: where the first consonant syllabifies as a simple coda, and the second as a simple onset. This has proved problematic in Kiswahili when it adapts a loanword with a medial consonant cluster (CC) because it prefers open syllables to closed syllables. In fact, Polome (1967:50) says that in words of Bantu stock, consonant sequences are always tautosyllabic, as in /ma.mba/ ‘crocodile’ and /ku.bwa/ ‘big’. He, however, adds that in loanwords the syllable boundary usually lies after the first two consonants, for example., between /l/ and /t/ in *sultani*, but in colloquial speech, this syllable-final consonant is often released with a short vowel, thus tending to re-establish the Bantu pattern of syllabification, for example., *labda* ‘perhaps’ /la.bu.da/ or *ratli* ‘pound’, also becomes /ra.ti.li/. I will use the word *sultani* to illustrate my point.

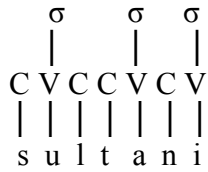
(8) Input: sulta:n
 Output: sultani

Let us try to syllabify the word *sultani*.

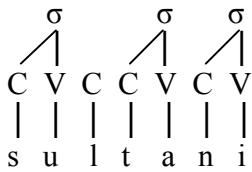
(i) Write the word “sultani” and link the letters to C or V forms as appropriate.

(9) C V C C V C V
 | | | | | | |
 s u l t a n i

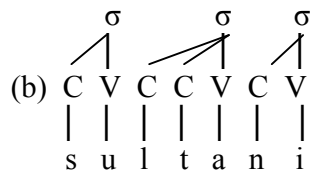
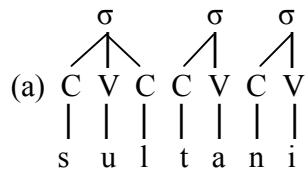
(10) Link each V element to a syllable symbol



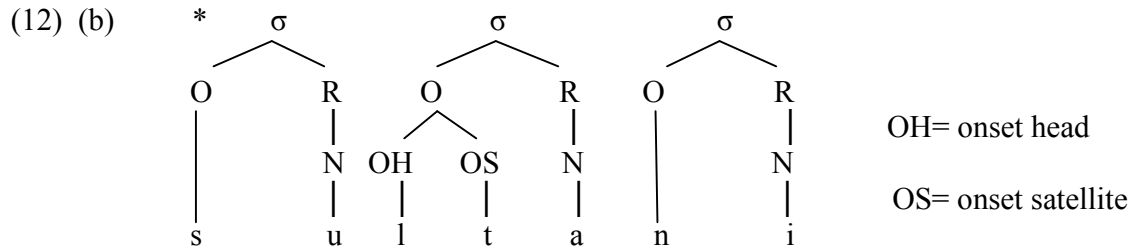
(11) Link C-elements to the V on their right.



(iv) Link C-elements to the V preceding them so long as the resulting sequence is allowed in the language.



In this example of the word *sultani*, we favour (a) against (b). Although (b) maintains the open syllable principle which is basic in Kiswahili, it violates the sonority principle in the second syllable; that is, the SON-SEQ constraint which requires complex onsets to rise in sonority and complex codas to fall in sonority. In (b), /l/ and /t/ are in onset position yet /l/ is more sonorous but is at the outer edge than /t/. This is illustrated in (12):



The syllabified word, /sul.ta.ni/, can be arrived at using the following constraints.

Input: /sul.ta:n/	*COMPLEX	SON-SEQ	NOCODA	DEP-IO
a. \Rightarrow sul.ta.ni			*	*
b. su.lta.ni	*!	*		*
c. sul.ta.ni			* *!	*

Although some borrowed words with word-medial consonant clusters are heterosyllabic, e.g./sul.ta.ni/, other words do not take this option but prefer to break up the cluster by epenthesis, for example.,

- (13) *ibli:s* ‘devil’ → /i.bi.li.si /
ibri:q ‘kettle’ → /bi.ri.ka /

Suffice to say that the unmarked situation in Kiswahili is for syllables to lack coda. The syllabification of a word like *kubwa* ‘big’ will differ from that of *sultani* because the sonority between the two consonants which appear mid-word is arranged differently. It is possible to maximize the onset and have open syllables like /ku.bwa/; but vowel epenthesis as in (c) below will not work. This is how its constraints can be ordered on the tableau.

Input:/ kubwa /	SON-SEQ	NOCODA	DEP-IO	*COMPLEX
a. \Rightarrow ku.bwa				*
b. kub.wa		*!		
c. ku.bu.wa			*!	

Kiswahili treats loanwords from Arabic with medial consonant cluster, final consonant cluster and just a final consonant in a similar way. This is because the language insists on maximum onset and minimum coda. In these cases, a vowel is inserted in between the consonant cluster or word finally. Look at these examples:

(14)	adhuhur	→	adhuhuri	/a.ðu.hu.ri/	‘midday’
	ahd	→	ahadi	/a.ha.di/	‘promise’
	urs	→	arusi	/a.ru.si/	‘wedding’
	milk	→	miliki	/mi.li.ki/	‘property’, ‘possession’
	waqt	→	wakati	/wa.ka.ti/	‘time’

It is possible to predict what kind of vowel will be added in word final position during epenthesis. Words borrowed from Arabic which end in a consonant acquire additional vowels whose type is determined by the nature of the final consonant; after labials, /u/ or /o/ is added, and after coronals and dorsals, /i/ or /e/ is added.

(15)	<u>/o/ or /u/</u>			<u>/i/ or /e/</u>	
	amm	→	amu	‘uncle’	waqt → wakati ‘time’
	asquf	→	askofu	‘bishop’	ahd → ahadi ‘promise’
	ibd Adamu	→	binadamu	‘human being’	ars → arusi ‘wedding’
	aawa:m	→	awamu	‘inception’	milk → miliki ‘property’
	ibn amm	→	binamu	* ‘cousin’	
	iara:b	→	irabu	‘vowel’	
	taab	→	taabu	‘trouble’	


Consonant Deletion

Segment deletion is another way to avoid violation of the NOCODA condition which Kiswahili tries to uphold. Segment deletion is a violation of faithfulness because an input segment has no counterpart in the output. The constraint that enforces the preservation of input segments in the output is MAX-IO. Careful analysis of the data shows that consonant deletion will occur when there is a geminate consonant. In that case, one of the consonants of the geminate is dropped, for example,

(16)	ammar	→	amiri	/a.mi.ri/	‘begin’
	amm	→	amu	/a.mu/	‘uncle’
	assubh	→	asubuhi	/a.su.bu.hi/	‘morning’
	ibn amm	→	binamu	/bi.na.mu/	*’ cousin’
	budd	→	budi	/bu.di/	‘alternative’
	iddaaa	→	dai	/da.i/	‘claim’, ‘demand’
	ghass	→	ghasia	/ya.si.a/	‘confusion’, ‘bustle’
	hadd	→	hadi	/ha.di/	‘until’
	saffa:	→	safi	/sa.fi/	‘become clear’ ‘clean’

Consonant deletion to resolve violations of the coda condition will involve:

NOCODA > MAX-IO
 ha.di > hadd

Input: / hadd /	*COMPLEX	NOCODA	MAX-IO	DEP-IO
a. hadd	*!	*		
b. had.di		*!		*
c.  ha.di			*	*
d. ha.ddi	*!			*

As can be seen in the example in the tableau, consonant deletion alone is not enough to make these syllables well-formed. It must work hand in hand with vowel epenthesis.


Cluster Tolerance

There are a few cases where Kiswahili maintained clusters that were in the borrowed Arabic word. In Optimality Theory terms, this indicates faithfulness. Below are examples of consonant cluster tolerance.

(17)	unwan	→	anwani	/a.nwa.ni/	‘address’
	usqf	→	askofu	/as.ko.fu/	‘bishop’
	izz	→	enzi	/en.zi/	‘rule’, ‘power’, ‘domain’
	sultan	→	sultani	/sul.ta.ni/	‘king’, ‘ruler’, ‘chief’
	amr	→	amri	/am.ri/	‘command’

The faithfulness constraint militating against epenthesis is DEP-IO, and against syncope is MAX-IO. This can be represented on a tableau with a word like *amri*.

/amr/ → amri

Input: / amr /	*COMPLEX	SON-SEQ	DEP-IO	NOCODA
a.  am.ri			*	*
b. amr	*!			*
c. a.mri	*!	*	*	
d. a.mu.ri			* *!	
e. amr.i	*!		*	*

So far it seems there is a free variation in the syllabification of CC clusters in words. It can either be heterosyllabic like /sul.ta.ni/ or tautosyllabic like /ku.bwa/.

The examples listed above indicate that Kiswahili does accept consonant clusters. On the consonant cluster tolerance, Batibo (1995:39) notes that the language has become unique among Bantu languages due to its insensitivity to consonant clusters. This, he explains, is due to three reasons:


- (a) Its long association with foreign languages, particularly Arabic.
- (b) Its susceptibility to borrowing foreign words.
- (c) Identification with Arabicism and Anglicism has prevented nativization because of popular use of the borrowed items.

There are also a few examples of vocalic complexes which have been tolerated in Kiswahili. These are listed below:


(18) aib	→	aibu	/a.i.bu/	‘shame’
baia	→	bei	/be.i/	‘price’
iddaaa	→	dai	/da.i/	‘claim’, ‘demand’
kaid	→	kaidi	/ka.i.di/	‘obstinate’, ‘disobedient’
naam	→	naam	/naam/	‘yes’, ‘certainly’
taab	→	taabu	/ta.a.bu/	‘trouble’
za:id	→	zaidi	/za.i.di/	‘more’, ‘besides’

It seems that where a borrowed word has three or more vowels in a row, some are deleted so that at most two remain. This is what we see in /iddaaa/ → dai ‘claim’, /aib/ → aibu ‘shame’ and /baia/ → bei ‘price’. What then emerges is that Kiswahili can comfortably accommodate two vowels occurring in a row; it is not in the tendency of employing consonant epenthesis to break vowel clusters. In that case, when a loanword has a hiatus, either vowel syncope can be employed to reduce the cluster or the word is adapted the way it is with no changes. The constraint that is violated in these examples is ONSET.

/baia/ → bei

Input: /baia/	*COMPLEX ^{VOW}	ONSET	IDENT-IO(F)	MAX-V
a. ba.i.a		* *!		
b.  be.i		*	*	*
c. bai.a	*!	*		

/aib/ → aibu

Input: /aib/	*COMPLEX ^{VOW}	NOCODA	DEP-IO	ONSET
a.  a.i.bu			*	* *
b. ai.bu	*!		*	*
c. a.ib.u		*!	*	* * *
d. a.ib		*!		* *


Feature Change

Other changes noted in this data have got to do with the phonemes themselves. There are some phonemes that are found in Arabic but are not in the Kiswahili phonemic inventory. If a loanword has such a phoneme, then it has to be changed to the nearest equivalent in the recipient language. Below are examples where Arabic /q/ and /kh/ are realized as /k/ and /h/ respectively in Kiswahili.

(19)	/q/ →	[k]		
	waqf	→	wakfu	/wak.fu/ ‘religious endowment’
	wa:faq	→	afiki	/a.fi.ki/ ‘to agree with’
	aqd	→	akidi	/a.ki.di/ ‘celebrating a wedding’
	aql	→	akili	/a.ki.li/ ‘intelligence’
	usqf	→	askofu	/a.sko.fu/ ‘bishop’
	ibri:q	→	birika	/bi.ri.ka/ ‘kettle’, ‘cistern’
	ta:ri:kh	→	tarehe	/ta.re.he/ ‘date’, ‘chronology’, ‘annals’
	waqt	→	wakati	/wa.ka.ti/ ‘time’
	ya:qu:t	→	yakuti	/ya.ku.ti/ ‘ruby’, ‘sapphire’

/ kh/ → [h]
 akhar → ahirisha /a.hi.ri.sha/ ‘postpone’
 bakht → bahati /ba.ha.ti/ ‘luck’, ‘fortune’

We can use the constraint IDENT-IO (place) together with the others introduced earlier to show the changes that have taken place here.

Input: /waqt/	*COMPLEX	NOCODA	IDENT-IO(place)	DEP-IO
a.  wa.ka.ti			*	* *
b. waqt	*!	*		
c. wakt	*!	*	*	
d. wak.ti		*!	*	*

Conclusion

This paper has done an analysis of Kiswahili loanwords from Arabic using the collection of words in Bosha (1993). A point that has clearly manifested itself is that Kiswahili prefers vowel epenthesis to vowel syncope or acope in the resyllabification of loanwords. The analysis has also shown that Kiswahili has two main epenthetic vowels, /i/ and /u/, which to some extent are contextually predictable. Though Kiswahili is an open syllable language, I have shown that loanwords have forced it to take up closed syllables so as not to violate the sonority hierarchy within the syllable. It is difficult to explain this in phonology without going into sociolinguistics. It seems that Kiswahili as a borrowing language was at the substratum in comparison to the lending languages which were at the superstratum. This made it prestigious to retain the phonotactics of the lending language. This means that, although the language has a mechanism of adapting new words, sometimes not all syllables or words are repaired; there is a high level of tolerance.

Generally, this paper has also shown that Optimality Theory can be effectively used to analyze nativization of loanwords without having to resort to rule based phonology. This has been done by looking at the interplay between faithfulness and markedness in the syllable repair process.

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Appendix

Kiswahili words with Arabic and English translations replicated from Bosha(1993)

<i>Arabic Word</i>	<i>Swahili Word</i>	<i>Formal Transcription</i>	<i>English Word</i>
adhuhr	adhuhuri	aḏu ^h huri	midday
wa:faq	afiki	a ^f fiki	to agree with
ahd	ahadi	a ^h hadi	promise
ahl	ahali	a ^h hali	relatives, family
akhar	ahirisha	ah ⁱ riša	postpone
aib	aibu	a ⁱ ibu	shame
aqd	akidi	a ^k kidi	celebrating a wedding
aql	akili	a ^k kili	intelligence
alahr	alahr	ala ^h siri	afternoon
ammar	amiri	a ^m miri	begin
amm	amu	a ^m mu	uncle
unwan	anwani	a ⁿ nwani	address

urs	arusi	a ^l rusi	wedding
asl	asili	a ^l sili	root, source
usquf	askofu	as ^l kofu	bishop
assubh	asubuhi	asu ^l buhi	morning
bakht	bahati	ba ^l hati	luck, fortune
baia	bei	^l bei	price
ibni Adamu	binadamu	bina ^l damu	human being
ibn amm	binamu	bi ^l namu	* cousin
ibri:q	birika	bi ^l rika	kettle, cistern
budd	budi	^l budi	alternative
iddaaa	dai	^l dai	claim, demand
dain	deni	^l deni	claim, debt
izz	enzi	^l enzi	rule, power, dominion
fihris	faharasa	faha ^l rasa	index
ghass	ghasia	ya ^l sia	confusion, bustle
hadd	hadi	^l hadi	until
ibli:s	ibilisi	ibi ^l lisi	devil, satan
iara:b	irabu	i ^l rabu	vowel
jaash	jasho	^l jašo	sweat
ja:su:s	jasusi	ja ^l susi	spy
kaid	kaidi	ka ^l idi	obstinate, disobedient
maadin	madini	ma ^l dini	mine, mineral
du:d	mdudu	m ^l dudu	insect
milk	miliki	mi ^l liki	property, possession
naam	naam	^l naam	yes, certainly
raad	radi	^l radi	thunder
saffa:	safi	^l safi	become clear, clarify
sulta:n	sultani	sul ^l tani	king, ruler, chief
taab	taabu	ta ^l abu	trouble
ta:ri:kh	tarehe	ta ^l rehe	date, chronology
waqt	wakati	wa ^l kati	time
ya:qu:t	yakuti	ya ^l kuti	ruby, sapphire
za:id	zaidi	za ^l idi	more, besides
waqf	wakfu	^l wakfu	religious endowment