



# colomboType

## #001

This was presented at colomboType #001  
on 7th April 2018, Colombo

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Hi, I am  
**Sumanthri**

I love to research on typography

# Why?

i wanted to design a font - Sinhala font

[more... to the Why?](#)

i am a lecturer ----- what about Sinhala script?  
it was time to do my higher studies ----- it was time!

# PhD

i was searching for data - scientifically speaking - Researching

every where I go

ended at a dead end - a white wall!

# PhD

i was searching for data - scientifically speaking - Researching

ONLY WAY OUT WAS TO dig in

found letters - but some were already found - up to the 15th Century



# the letters after the 16th century

this is me!

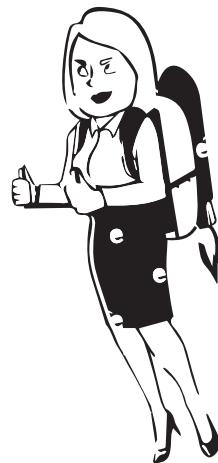


The start of the typographic era in Sinhala script

“So, if someone wanted to design a Sinhala font.... wat aspects  
should i address”

the root letters for Sinhala  
the distinguished Characteristics of each letter  
the visual variations of Sinhala fonts  
the historical aspect  
the technological changes, the designers - the meta data

This is what I did!



It was a start of a new Journey

# Root letters for Sinhala: Minimal letters with maximum properties

Dr. Sumanthri Samarawickrama

Dept. Integrated Design, University of Moratuwa, Sri Lanka.

# Concept of Root letters

‘root letters’ communicate an Indian philosophic concept of ‘*bijakshara*’

(*bija* meaning seed and *akshara* meaning letter); and hypothesizes a set of primordial letters which contain the germ of an entire font (G. Dalvi 2010: 238).

## Derivation of letters

ଇ → ଈ ଙ  
ନ୍ତ୍ର → ନ୍ତ୍ର ନ୍ତ୍ର  
ମୁଁ → ମୁଁ  
ରୁଁ → ରୁଁ

Devanagari Script

h - l n m u

Latin Script

The composition of other letters derived from one single letter derivation

Dalvi's calculation method is a pioneer experiment and the only proposal applied to Indic script; therefore the author testes it on the Sinhala script

hamburgere-  
fontsv

Hamburgefontsv

finnii nantier

hamburgefon

burgef

Hamburgefonts

Hamburgewon  
cip es  
i ee

Hamburgewon

ADHESION THIN  
ADHESION ROMAN  
ADHESION BOLD  
ADHESION BLACK  
ADHESION ROUND

ORIGINAL TYPEFACE | ALLONE

Adhesion

# Dalvi's theory

'Minimal letters with maximum properties'  
used to generate root letters for Devanagari

# Dalvi's model

Tests on semi experts, letter properties and a  
scoring mechanism to calculate a score for each  
letter.

# objective

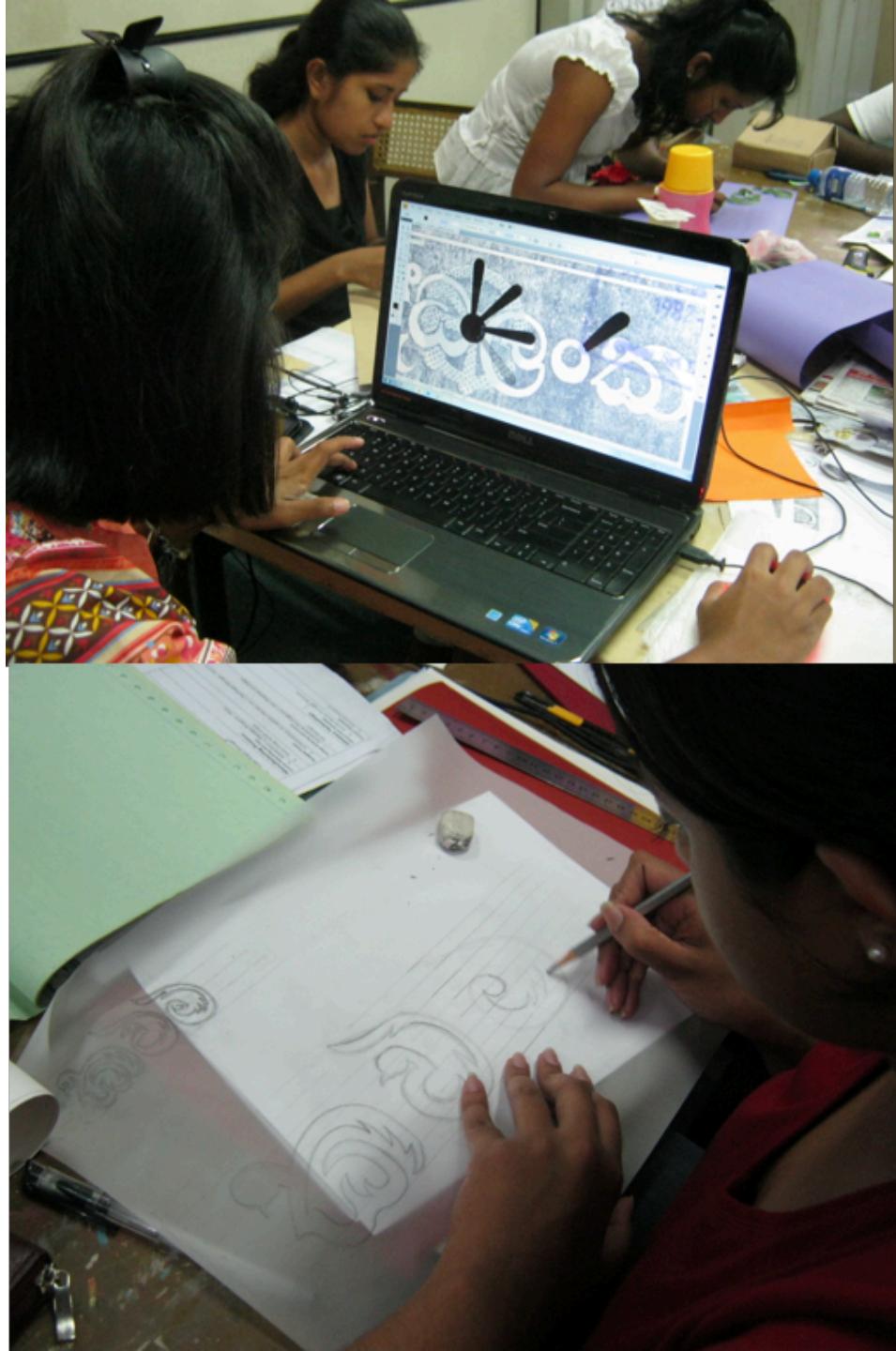
To identify the root letters for the Sinhala Script.

The sub-objectives :

- To understand how much Dalvi's calculation method is effective when applying for Sinhala.
- What are the factors associated with Dalvi's calculation method and its influence on the final result.

# Sinhala Script

- The type design process had evolved within a limited number of **self-taught professionals.**
- The letter properties were **not identified.**



# Variables

The letters? the visual features?

# Variables according to Dalvi

- Arrived at observing 50 font samples.
- Typefaces were partially random and partially selective,
- The concluding variables were based on clusters that were interpreted by experts and non-experts and the selected variables: counters, turns, knots, grey value, vertical terminals, contrast, axis, broad/tall, tool and the inclinations.

Dalvi describes these properties as **composite properties** as the variables are conceptualized according to the findings (in an initial study) through a visual survey.

## Scoring system

Variables	Property 01	Pr. 02	Pr. 03	Pr. 04	Pr. 05
Letters					
A					
B					
C					
D					
E					
F					

Sample

# Variables: for Sinhala?

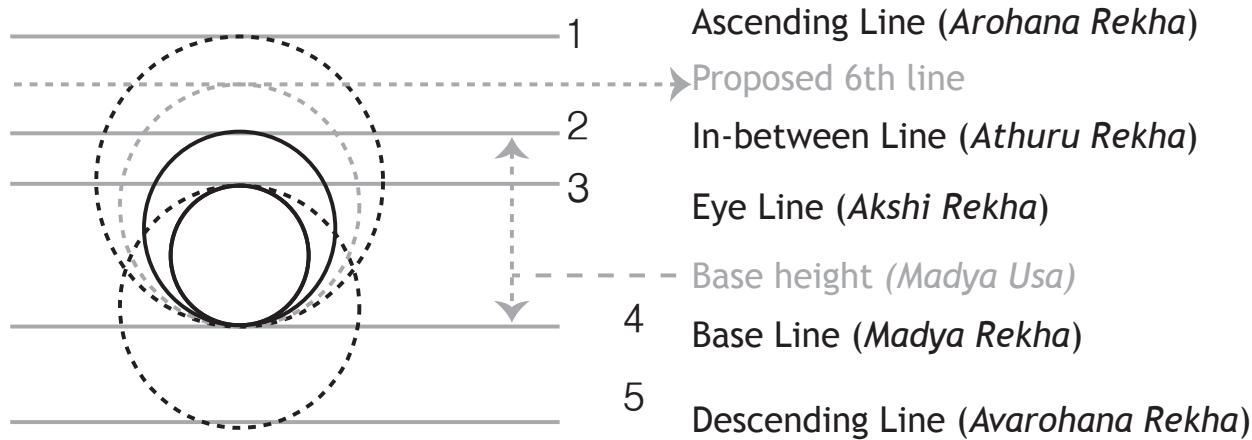
- The type design process had evolved within a limited number of **self-taught professionals**.
- The letter properties were **not identified**.



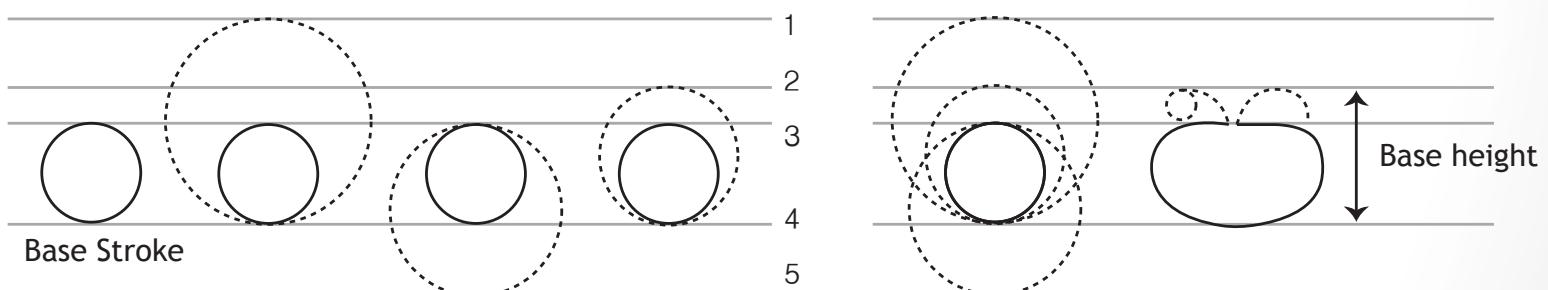
# Variables based: proposed grid

Identified by the author and published  
(Face Forward Conference, Dublin- Dec 2015).

- Visual survey- using an action research spiral.  
Which listed out distinguished features (DF) on  
the five guidelines.
- One typeface -The typeface introduced in the  
NIE publication (2005)



Ascender and Descender Stroke in relation to the Base Stroke



ć ć ć

ć ć ć

Line 1 - 2



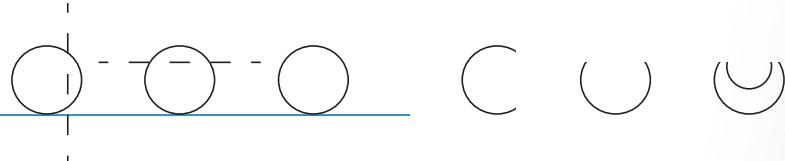
ć ć ć

Line 2 - 3



ć ć ć

Line 3-4



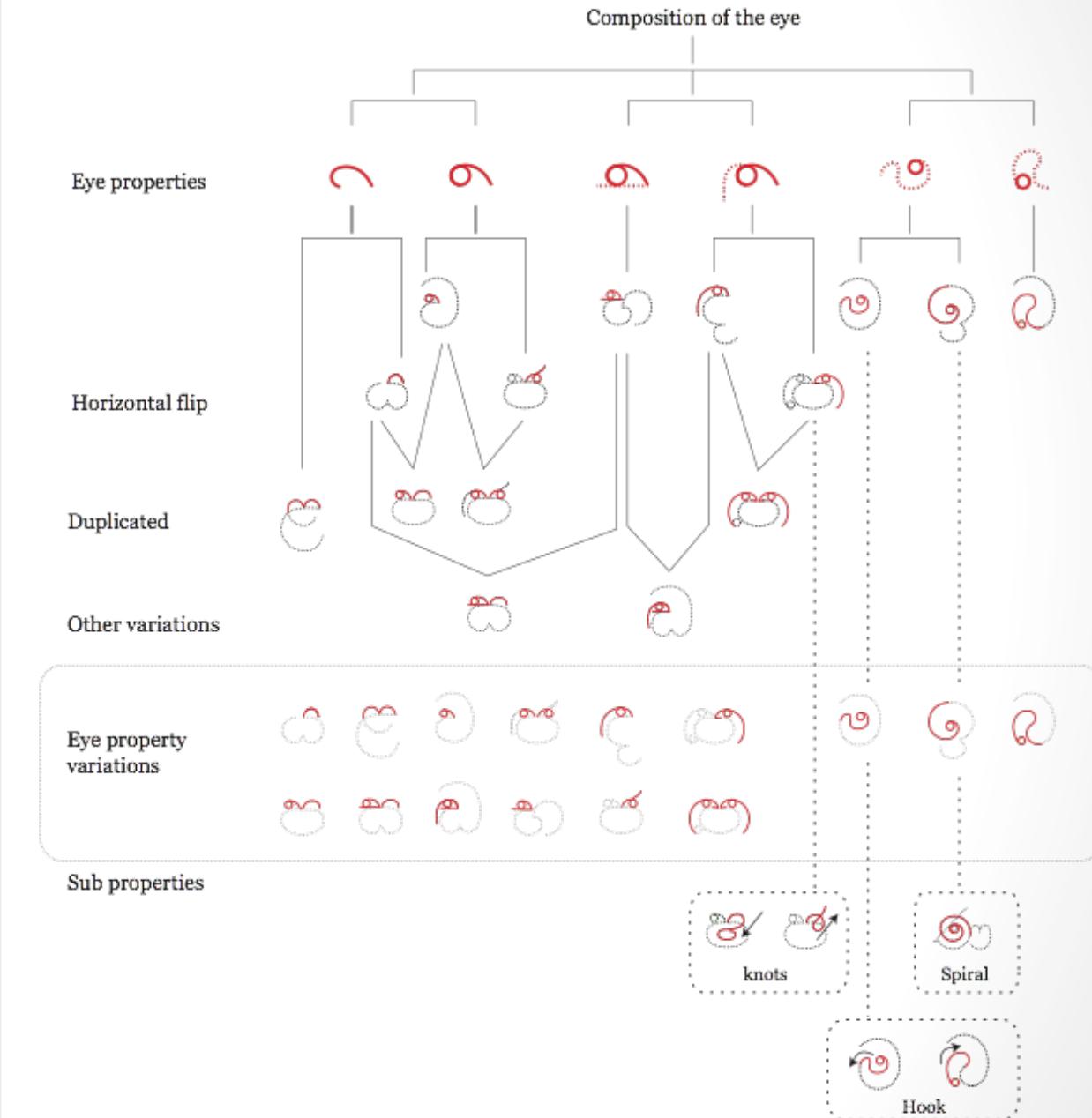
ć ć ć

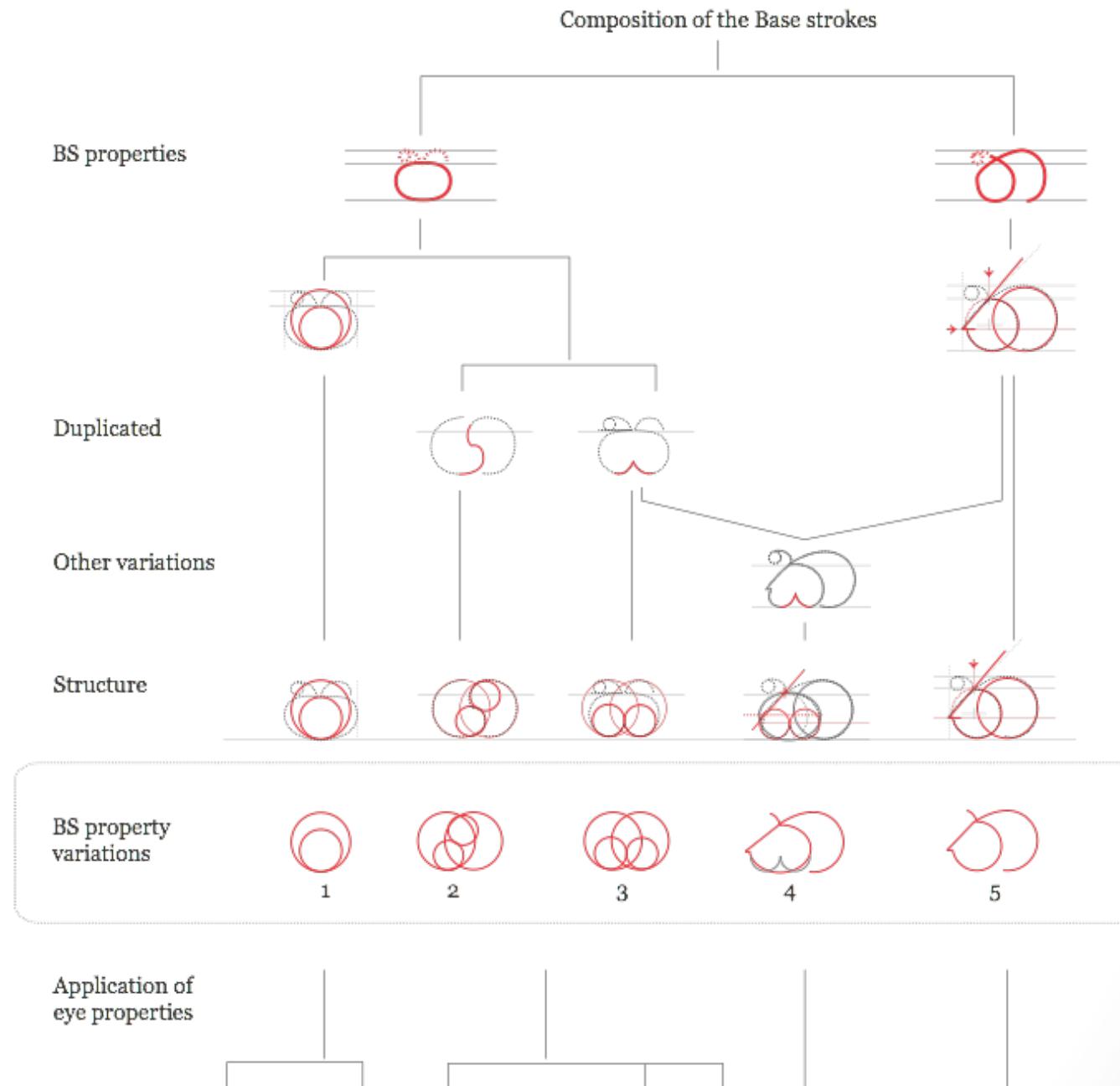
Line 4-5



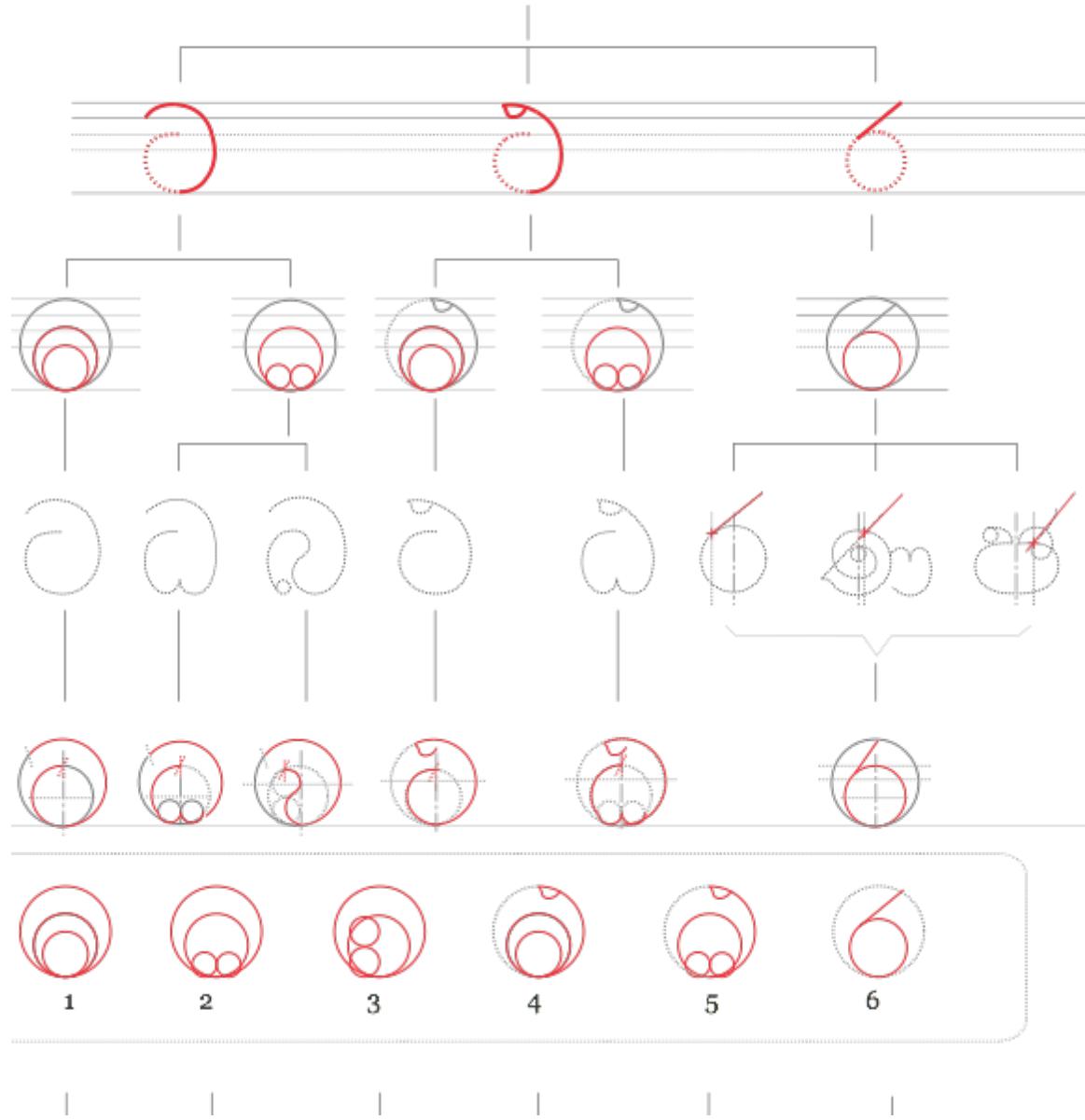
# THE EYE

Eye between line 2-3 and base line

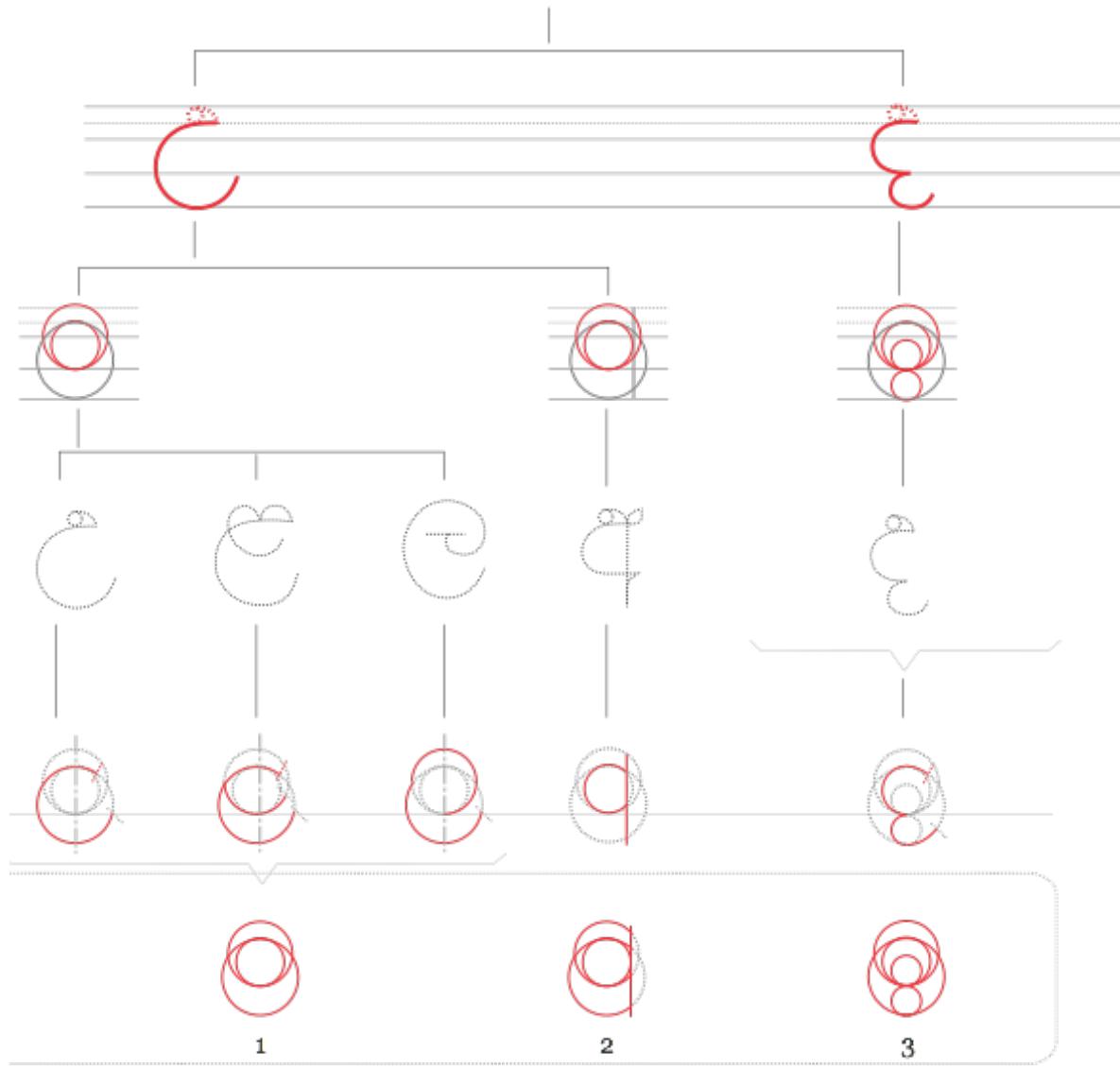




### Composition of the Ascender strokes



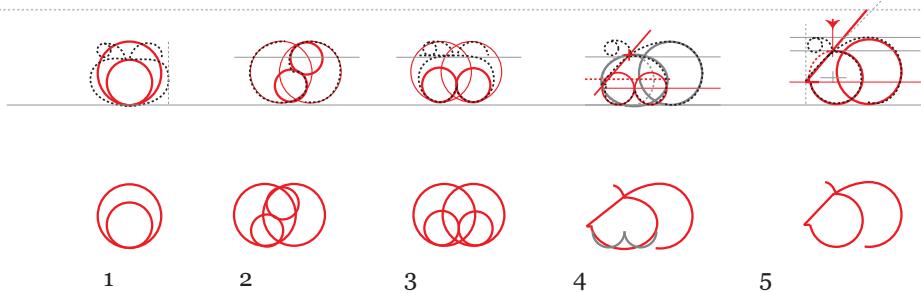
### Composition of the Descender strokes



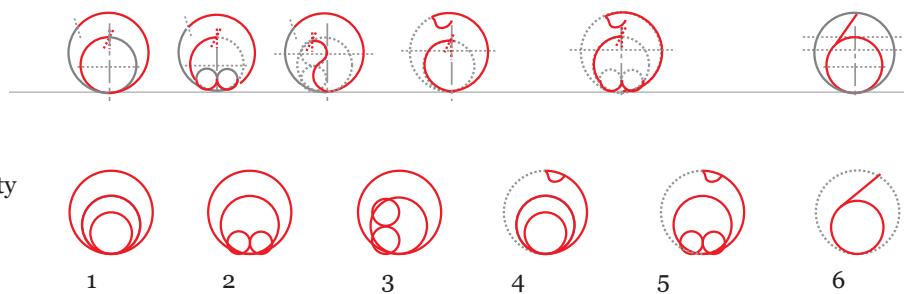
Eye property variations



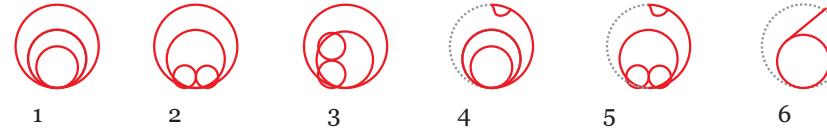
Structure



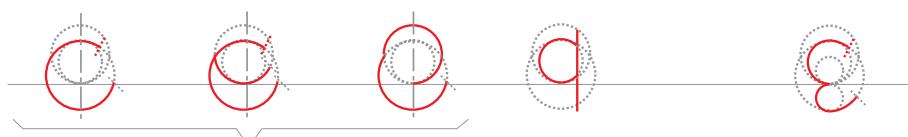
Structure



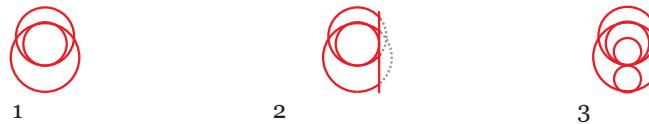
Ascender property variations



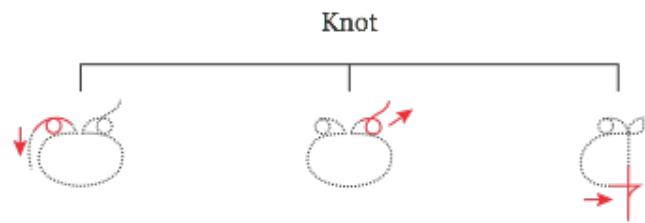
Structure



Descender property variations



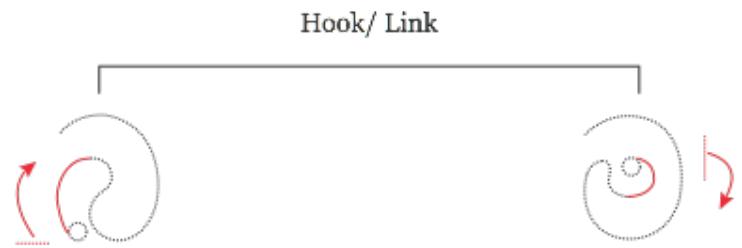
### Visual properties of the DF : Knot



### Variables composed with the DF : Knot



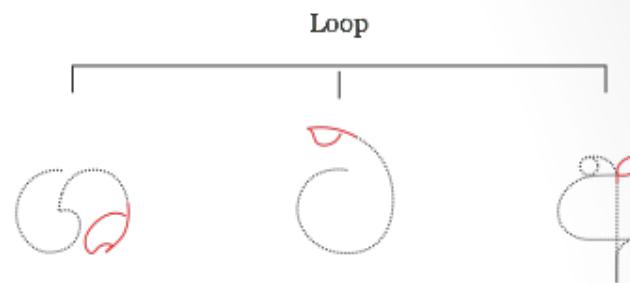
### Visual properties of the DF : Hook/ Link



### Variables composed with the DF : Hook/ Link



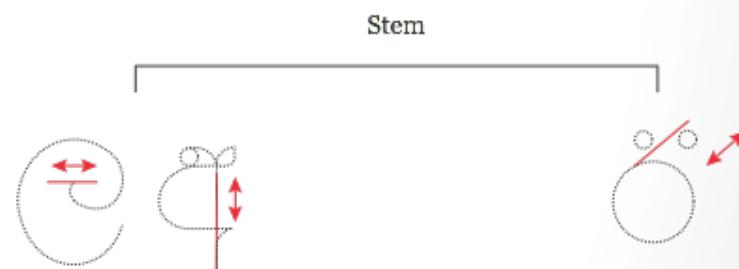
### Visual properties of the DF : Loop



### Variables composed with the DF : Loop



### Visual properties of the DF : Stem



### Variables composed with the DF : Stem



## List of distinguished features/ properties and the variables

DF	Properties	Variables
1. Eye	Eye o1	සිං සි ප ය සි ල ප්‍රා
	Eye o2	සිං අ උ කේ ර ර ද ත ග කි ත න එ ව ජ
	Eye o3,o4	ව ක ව ඔ ඩ ඩ බ ග ග   ග ද ජ ජ ඔ ද
	Eye o5,o6	ම ම ම   ඉ තු බ බ බ
2. Base Stroke	BS o1, o2, o3	ග ප ප ප   ග ග ග ග ග   සිං සි ය සි ය
	BS o4, o5	ක ති දු   ත ත
3. Ascender Stroke	AS o1, o2, o3, o4	ව ව ම ව   ම ම ම ම ම ම   බ බ
	AS o5 As o6	ඩ ඩ ඩ ඩ   ඊ ඊ ඊ ඊ ඊ
4. Descender Stroke	DS o1, o2, o3,	ල ල ල   ආ   ඉ ඉ ඉ ඉ
5. Knot	o1, o2, o3,	ඛ   ඕ ඕ ඕ ඕ   ඇ

List of distinguished features/ properties and the variables

DF	Properties	Variables
1. Eye	Eye o1	සිං ති පි ය ති ල එම්මු
	Eye o2	යිප අලු කර පදු සිහ කිනාව එම්මු
	Eye o3,o4	එක ව බ ද සිං ය නි   ගැකු ජේ බ ද
	Eye o5,o6	ඡම බ   ඉතු බබ බ
2. Base Stroke	BS o1, o2, o3	ඛ ප පී   ග ත ග ග ග   ඩි ති ය ඩි ග
	BS o4, o5	ඩ කියු   ත ත
3. Ascender Stroke	AS o1, o2, o3, o4	ඇ ඇ ඉ ඉ   ග ම බ බ කි බ බ   බ බ
	AS o5 As o6	ච ච ච ච   ඊ ඊ ඊ ඊ ඊ   ඊ ඊ
4. Descender Stroke	DS o1, o2, o3,	උ උ උ   ආ   ඉ ඉ ඉ ඉ
5. Knot	o1, o2, o3,	ග   ප ප ප ප   ආ
6. Hook/ Link	o1, o2,	ඡ ම බ   බ බ බ
7. Nose/ Point	o1, o2,	න ණ න ක කි කු බ   න
8. Hump	o1, o2,	හ   ම
9. Stem	o1, o2, o3	ල ඇ   ඊ ඊ ඊ ඊ ඊ ඊ   ඊ ඊ
10. Spiral	o1, o2,	ං   ග
11. Shoulder	o1, o2, o3	ග   ය නු   දු ප න බ කු
12. Loop	o1, o2, o3	ග ය ප ප ප බ   ඊ එ එ එ   ආ

No.	Variables	DF	eye						Base Stroke					Ascender		
			Properties	cyc 1	cyc 2	cyc 3	cyc 4	cyc 5	cyc 6	BS 1	BS 2	BS 3	BS 4	BS 5	Ax 1	Ax 2
1	፩				1											
2	፪										1					
3	፫															
4	፬				1											
5	፭			1		1							1			
6	፮						1				1					
7	፯					1										
8	፰							1								
9	፱			1										1		
10	፲									1						
11	፳											1				
12	፴			1		1							1			
13	፵										1					
14	፶											1				
15	፷					1									1	
16	፸			1	1											
17	፹					1										
18	፺						1							1		

The composition of other letters derived from one single letter derivation

# The unique letters (UL)

The total score of the properties were summoned up and placed in ascending order.

The properties that have the lowest score were isolated, as those atomic properties would only be relevant to the letters that had the lowest score.

## 1.0 Unique letters in Sinhala

අ, ස, ඩ, ර, ම, ඉ, එ, ග, උ, න

Root letters for Sinhala: evaluation	Unique letters	Max letters - range	Max properties
<b>RL 01 – initial calculation</b>	3	05 -15	NA
RL 01 <i>nya</i> (න්යා), <i>nja</i> (ඇ), <i>iru</i> (ඒං), <i>nda</i> (එ), <i>kha</i> (ඁ), <i>tha</i> (ත), <i>o</i> (ඖ), <i>ndha</i> (ඉං), <i>da</i> (උ), <i>bha</i> (ඃ)	0	20 -30	40/49

# Letters derived from the Root letter : 1

d.



ද ක ක් පත්‍ර ඉදින නුබල සාකච්ඡා

ද දු දු දු දු දු දු දු දු

ක යු යු යු යු යු යු යු යු

ක් යු යු යු යු යු යු යු යු

ජ යු යු යු යු යු

ජ් යු යු යු යු යු

ඇ යු යු යු යු යු

d.

ද ක ස ප හ බ ඉ ඊ න එ අ ඒ ඔ ඊ උ

ද	දද	දු	දද	දුද	දුදද	දුදු	දදද
ක	කද	කද	කද	කද	කදද	කදද	කදදද
ස	සද	සද	සද	සද	සදද	සදද	සදදද
ජ	ජද	ජද	ජද	ජද	ජදද	ජදද	ජදදද
ර	රද	රද	රද	රද	රදද	රදද	රදදද
ඒ	ඒද	ඒද	ඒද	ඒද	ඒදද	ඒදද	ඒදදද
ං	ංද	ංද	ංද	ංද	ංදද	ංදද	ංදදද
ආ	ආද	ආද	ආද	ආද	ආදද	ආදද	ආදදද
ඇ	ඇද	ඇද	ඇද	ඇද	ඇදද	ඇදද	ඇදදද
ඈ	ඈද	ඈද	ඈද	ඈද	ඈදද	ඈදද	ඈදදද
ඉ	ඉද	ඉද	ඉද	ඉද	ඉදද	ඉදද	ඉදදද
ඌ	ඌද	ඌද	ඌද	ඌද	ඌදද	ඌදද	ඌදදද
ඍ	ඍද	ඍද	ඍද	ඍද	ඍදද	ඍදද	ඍදදද
ඏ	ඏද	ඏද	ඏද	ඏද	ඏදද	ඏදද	ඏදදද
ඓ	ඓද	ඓද	ඓද	ඓද	ඓදද	ඓදද	ඓදදද
ඔ	ඔද	ඔද	ඔද	ඔද	ඔදද	ඔදද	ඔදදද
ඕ	ඕද	ඕද	ඕද	ඕද	ඕදද	ඕදද	ඕදදද
ඖ	ඖද	ඖද	ඖද	ඖද	ඖදද	ඖදද	ඖදදද
඘	඘ද	඘ද	඘ද	඘ද	඘දද	඘දද	඘දදද
඙	඙ද	඙ද	඙ද	඙ද	඙දද	඙දද	඙දදද

Root letter : 1 selection of first three letters

ද ක ස

# Root letter : 1

---

a.



Eye 04, Base stroke 04,  
Nose/Point 01, Shoulder 03

---

Eye joint 04, Curve to C Joint 02,  
Right angular J, Curve andgular J 01,  
Intersection 02, Terminal 08

---

b.

Eye 04



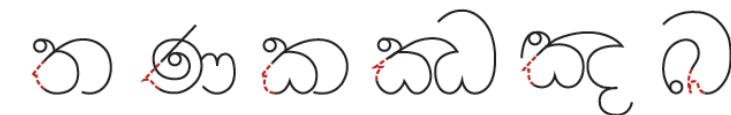
Base Stroke



Descender  
Stroke



Nose/ Point



Shoulder



## Root letter : 1

a.



Eye o4, Base stroke o4,  
Nose/Point o1, Shoulder o3

Descending stroke o3,

Eye joint o4, Curve to C Joint o2,  
Right angular J, Curve andgular J o1,  
Intersection o2, Terminal o8

b.

Eye o4



କ୍ନା କ୍ନା ଅ ପ ତ ଦ

Base Stroke



କ୍ନା କ୍ନା କ୍ନା

Descender  
Stroke



କ୍ନା କ୍ନା କ୍ନା

Nose/ Point



କ୍ନା କ୍ନା କ୍ନା କ୍ନା କ୍ନା

Shoulder



କ୍ନା କ୍ନା କ୍ନା କ୍ନା

Eye Joint o4



କ୍ନା କ୍ନା ଅ ପ ତ ଦ

Curve to Curve Jt o2



କ୍ନା କ୍ନା କ୍ନା କ୍ନା କ୍ନା

Curve to Curve Jt o4



କ୍ନା କ୍ନା କ୍ନା କ୍ନା

Right angular Jt



କ୍ନା କ୍ନା

Curve angular Jt o1



କ୍ନା କ୍ନା କ୍ନା କ୍ନା

Intersection o1



କ୍ନା କ୍ନା ଅ ପ ତ ଦ

Intersection o2



କ୍ନା କ୍ନା କ୍ନା

Terminal o8



କ୍ନା କ୍ନା କ୍ନା

c. Letters derived from the Root letter : 1

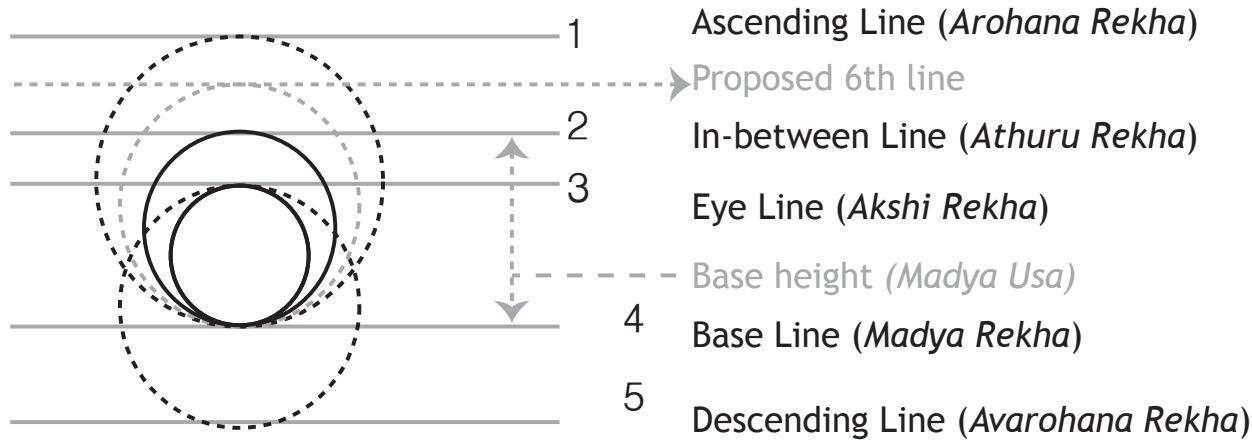


କ୍ନା କ୍ନା ଅ ପ ତ ଦ କ୍ନା କ୍ନା

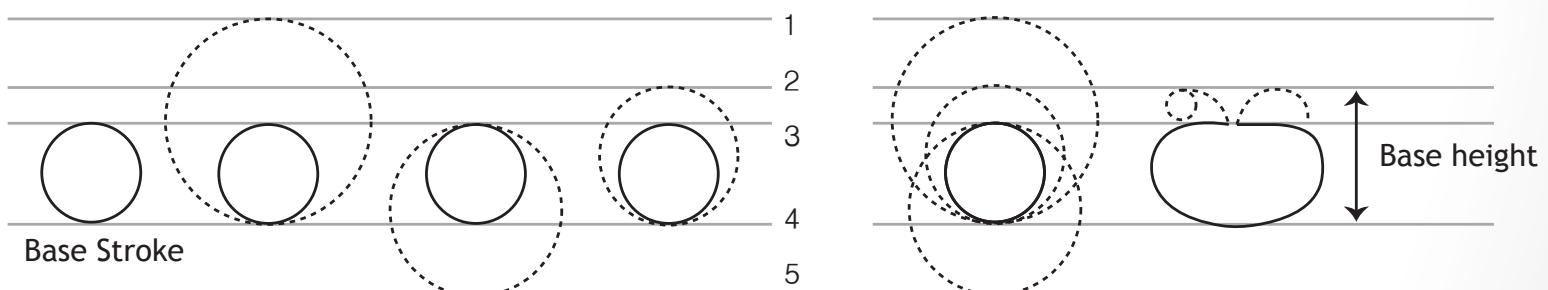
Sample card of root letter *kna*:  
its visual properties and common letters

# Testing the Distinct features

With the proposed grid method



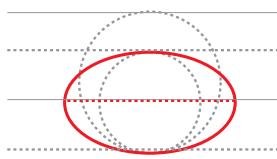
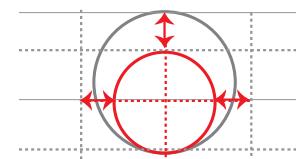
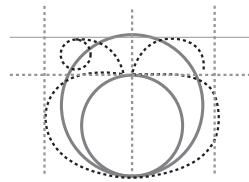
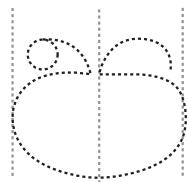
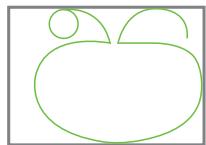
Ascender and Descender Stroke in relation to the Base Stroke



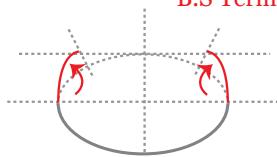
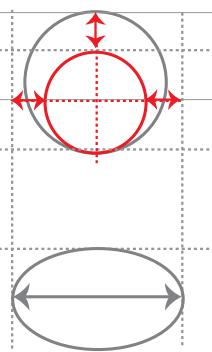
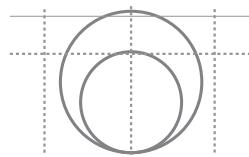
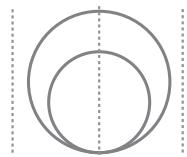
# Composition of the Base stroke o1

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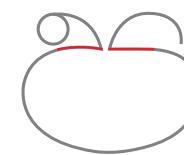
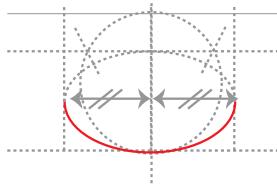
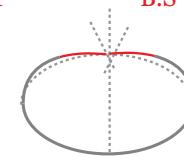
ga ration



B.S Terminal o1



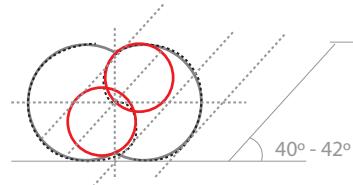
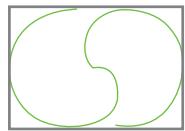
B.S Terminal o2



## composition of the Base stroke primitive o2 an o3

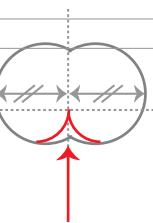
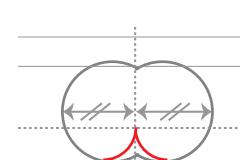
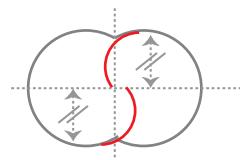
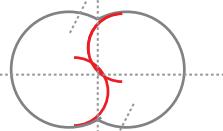
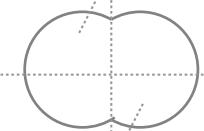
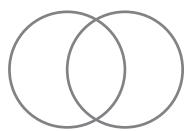
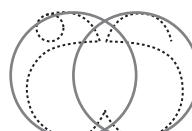
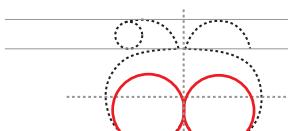
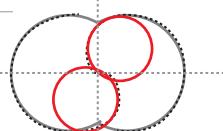
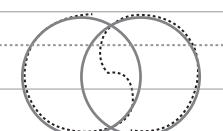
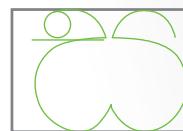
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ga ration



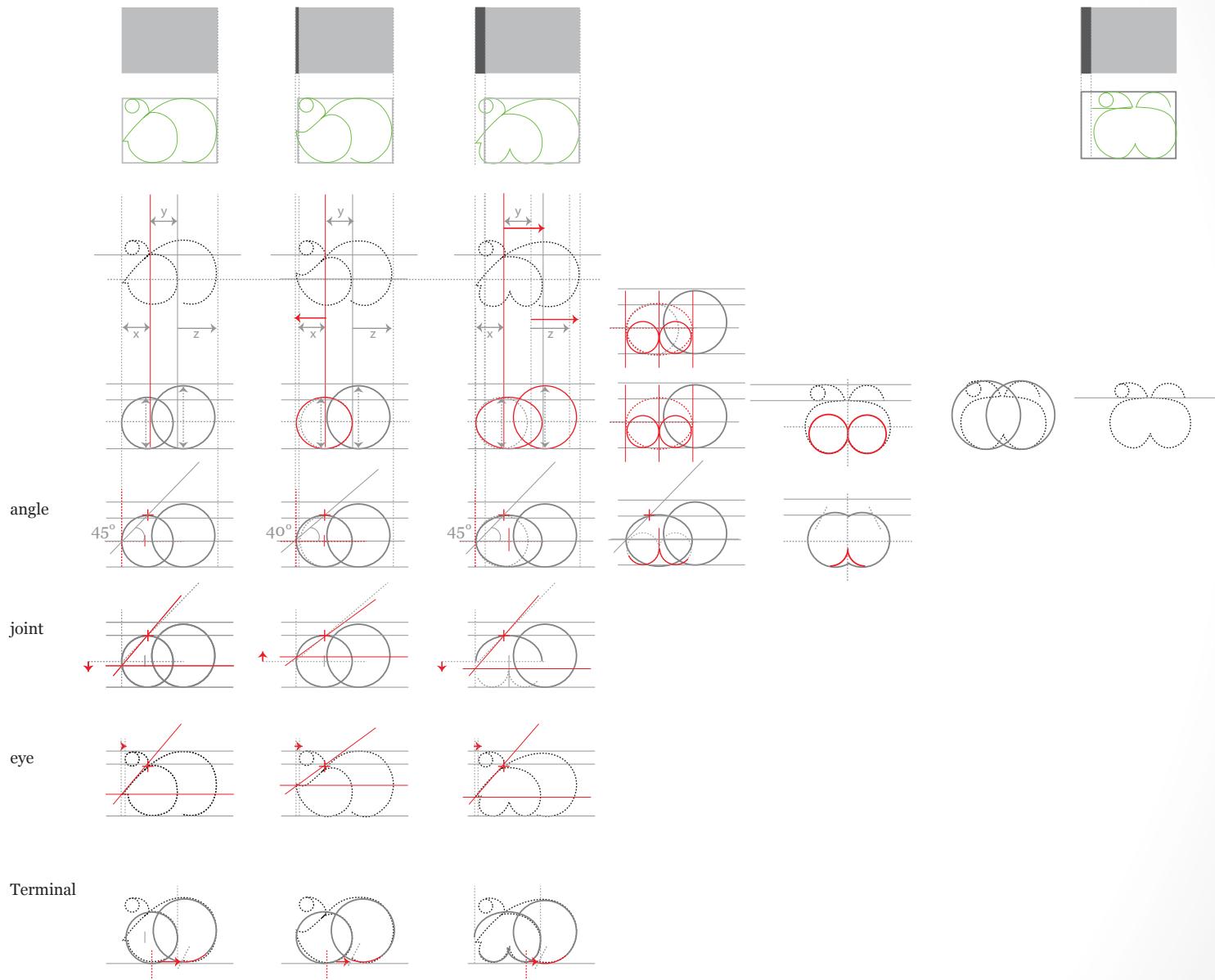
extreme point

ga ration



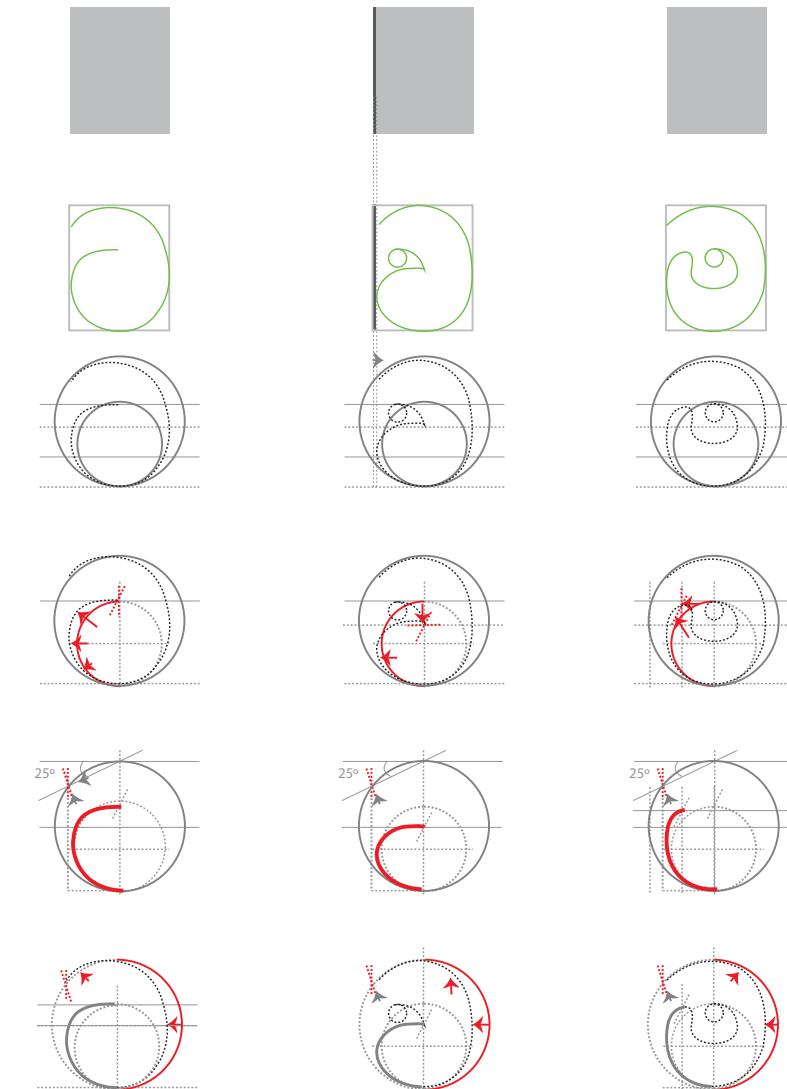
## Composition of the Base stroke primitive o3 and o5

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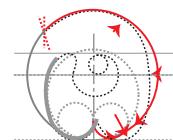
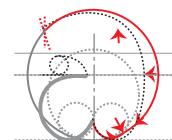
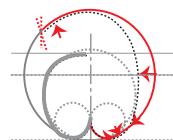
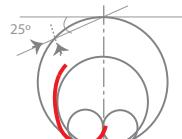
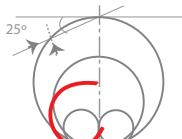
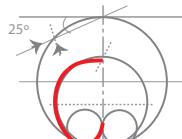
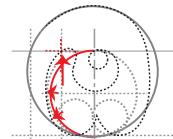
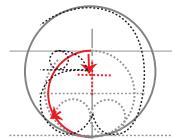
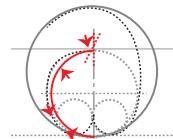
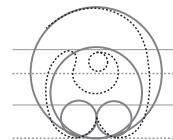
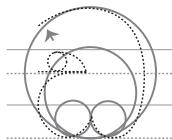
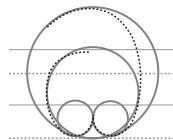
## Composition of the ascender stroke primitive o1

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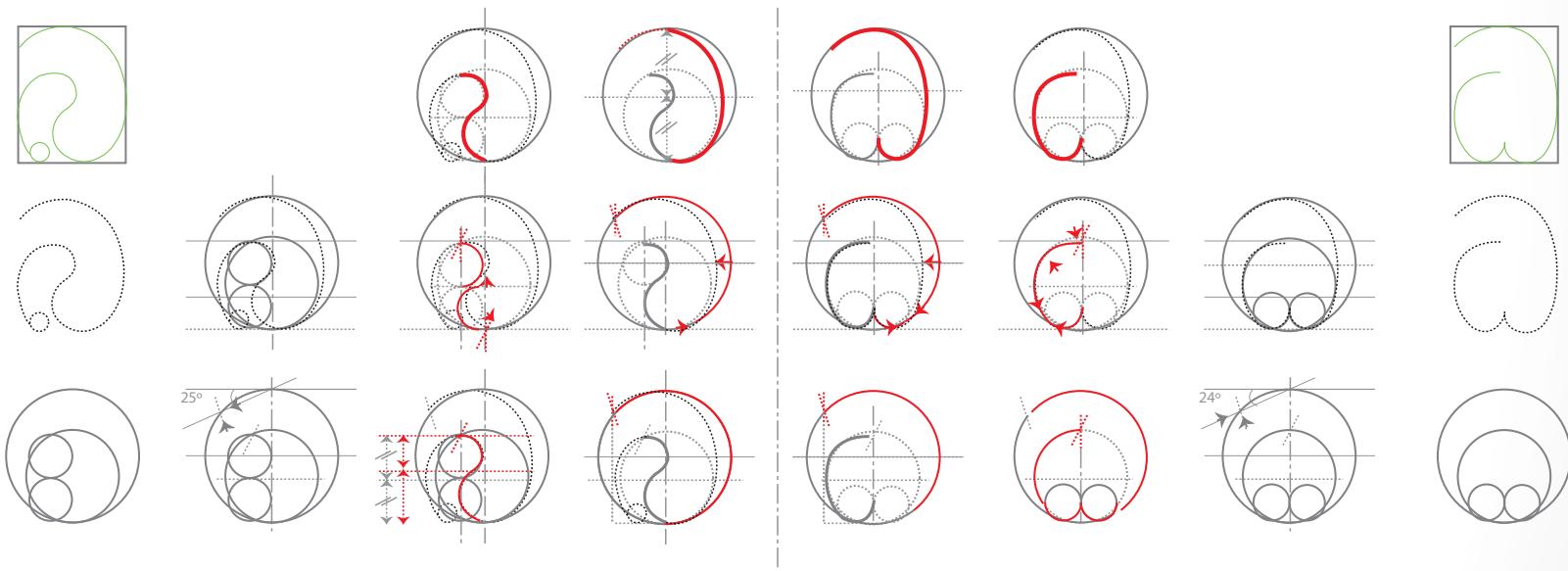


## Composition of the ascender stroke primitive o2

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## Composition of the ascender stroke primitive o2 and o3



Root letters for Sinhala: evaluation	Unique letters	Max letters - range	Max properties
RL 02 <i>pa (ප), g a(ඁ), ka (ක), ma (ම), nda (ං), ba (ඃ), ta (ත), ra (ර), u (උ), da (ඇ).</i>	0	20 -30	41/49

	Unique letters	Max letters - range	Max properties
RL 01 –initial calculation	3	05 -15	NA
RL 01	0	20 -30	40/49
RL 02	0	20 -30	41/49

Root letters for Sinhala: evaluation	Unique letters	Max letters - range	Max properties
<b>RL 01 – initial calculation</b>	3	05 -15	NA
RL 01 <i>nya</i> (න්යා), <i>nja</i> (ඇඟා), <i>iru</i> (ඒරා), <i>nda</i> (ංඩා), <i>kha</i> (ඁභා), <i>tha</i> (තා), <i>o</i> (ඖ), <i>ndha</i> (ංඩ්ඩා), <i>da</i> (උඳා), <i>bha</i> (ඊභා)	0	20 -30	40/49
RL 02 <i>pa</i> (පා), <i>g a</i> (ගා), <i>ka</i> (කා), <i>ma</i> (මා), <i>nda</i> (ංඩා), <i>ba</i> (ඊඩා), <i>ta</i> (තා), <i>ra</i> (රා), <i>u</i> (ු), <i>da</i> (උඳා).	0	20 -30	41/49

# Findings and observations

- Root letters
- Dalvi's calculation method
- The proposed grid method
- Unique letters for Sinhala
- Appropriate set of root letters for Sinhala,  
type design process

