Designing A Devanagari Font

Communication Design Project 2

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Guide:
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IDC School of Design,
Indian Institute of Technology, Bombay

Approval Sheet

This project entitled “Designing a Devanagari Font” by Sanket Gonte is approved, in partial fulfillment of the requirements for Masters of Design Degree in Communication Design.

Guide: 

Chairperson: 

Internal Examiner: 

External Examiner: 

Date: 13/12/18

Declaration

I hereby declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea, data, fact, source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Signature: 

Date: 13/12/18

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Acknowledgement

I would like to express my heartfelt gratitude to those who have been a part of my design journey at IDC.

My guide, Prof. G. V. Sreekumar for sharing his invaluable experience and knowledge in typography and giving me a positive energy, constant encouragement and guidance along every step of the project.

Prof. Mandar Rane, Prof. Raja Mohanty, Prof. Sudesh Balan and Prof. Prasad Bokil of Communication Design for their constructive opinions and criticism; Prof. Girish Dalvi, for giving encouragement and guidance in the project.

The staff and administration at IDC (library and office) for support and making available the facilities at hand.

Most importantly, Mr. Manoj Gopinath, Joint Director & Head of the Department, Media & Communications, Centre for Development of Advanced Computing (CDAC), Pune, for introducing me to type design, his invaluable guidance along the way and having faith in me to take this project forward.

Last, but not least, I would like to thank my mother, Vijayshree Gonte for always being the pillar of strength and support to me.

Signature: 

Date: 13/12/18

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Abstract

Aim of this project is to design a multi purpose-mono linear Devanagari font, which can be scaled to be used as a variable font in opentype format.

After initial form iterations in weight and width axis with emphasis on readability, it was decided to create a form which is not too roundish or too squarish, but to go with a form which is in between the two styles.

The final font follows a unique visual form which is unique and finds a peculiar blend of round and square visual primitive. The final output is currently in single weight, which can be used for text as well as display purposes. The final form provides a good outline structure, for further development as an Opentype Variable font in multiple weights and width.

Contents

Introduction

Type design is a prolonged process which requires a copious amount of hard work, patience and a keen attention to intricate details. My encounter with type design occurred during the summer internship project (May - June, 2018) after second semester.

I worked on the project titled 'Variable Font Design for Devanagari Script', a new and relatively unexplored area in world of type design, under the distinguished guidance of Mr. Manoj Gopinath.

This project is the continuation of the aforementioned project. This report briefly captures the overall work process which includes initial study, ideation, designing, analysing, redesigning, testing and further refining of the font.

Preface

When it comes to Latin typefaces, there is a plethora of choices one can choose from for any purpose and context there possible. The number of Indic script typefaces is quite less as compared to that of Latin typefaces. With advent of Variable Fonts, which are resultant of OpenType font format version 1.8, door to exciting possibilities in type design was opened.

OpenType is a new standard for digital type fonts, developed jointly by Adobe and Microsoft. An OpenType font is a single file, which can be used on both Macintosh and Windows platforms without conversion. These fonts have many advantages over previous font formats because they contain more glyphs, support more languages and support rich typographic features such as small caps, old style figures, and ligatures — all in a single font.

Version 1.8 of OpenType font format specification introduced a new extension to the format known as OpenType Font Variations. Fonts that use these extensions are known as OpenType variable fonts.

An OpenType variable font is a single font that can behave like several fonts by using continuous interpolation between different designs, all defined within the single font.

The initial brief was to create a variable typeface in Devanagari which should be multipurpose, monolinear, aesthetically pleasant and appealing to all ages. To give it a modern feel, it should be neither too roundish nor too squarish as many of the Devanagari letterforms have a characteristic curviness. It was important not to let this feature affect the legibility of the letters.

After careful consideration and discussion with the guides, owing to the limited time for Project 2, it was decided to restrict the focus on completion of one weight of the font being designed.

Aim

The aim of the project is to design a monolinear Devanagari font.
This is an attempt to contribute to the realm of Devanagari typefaces while learning the process of type design.

Previous Project:
Designing a Variable Devanagari Typeface

This project titled 'Designing a Devanagari Font' was started as a summer internship project 'Designing a Variable Devanagari Typeface'. It has been documented in detail in the corresponding report.
The steps involved in the design process of the font from the very inception till the start of Project 2 (May- June, 2018) are enumerated in brief as follows:

- Study of parameters considered in Devanagari typeface design
- Comparative study of some monolinear Devanagari and Latin typefaces
- Sketching letters in order to come up with a different design
- Rendering the finalised sketches in Illustrator
- Getting acquainted with FontLab Studio, working on the glyphs in FontLab
- Printing samples, analysing them and refining the glyphs
- Getting acquainted with Variable fonts and how they are rendered in FontLab
- Completion of 12 consonents, 14 vowels & the corresponding maatras subject to further modifications
- Completion of the initial variable version of one character (Ka)

A few of the following pages show glimpses of the process.

Image 1

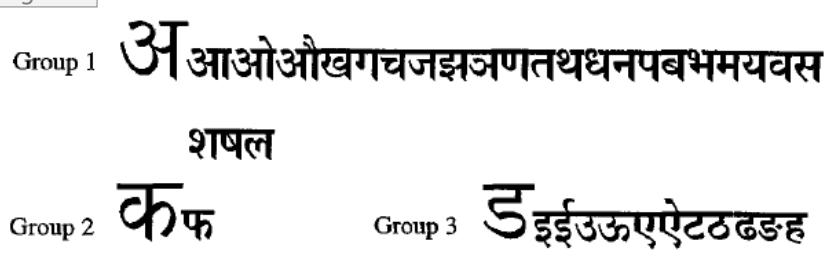
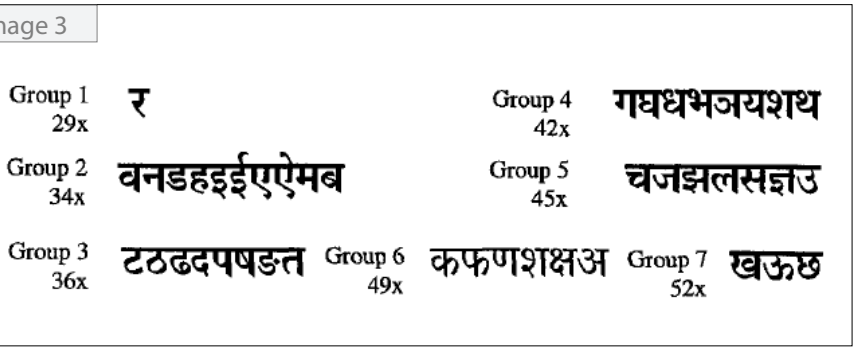


Image 2

Image 3



In order to ease up the typeface design process, letters are classified into different groups with respect to a shared feature among them. They are called design parameters, which are as follows:

1. Character Parameter

   Letters in any script have to be analyzed in order to identify the groups with respect to the typical common characteristics of the letters, here, position of vertical bar. (See Image 1)

2. Structural Parameter

   Letters are categorised on the basis of some common basic shapes which form the characters. (See Image 2)

3. Width Parameter

In any script all the letters are to be analyzed according to their actual width and the groups of letters having equal width are to be identified. (See Image 3)

Similarly, letters are categorised on the basis of joinery parameters and proportional parameters (See image 4).

Image 4

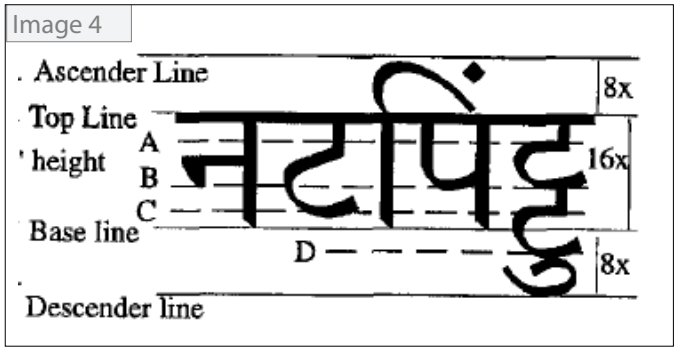
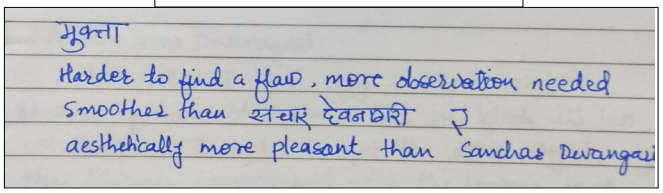


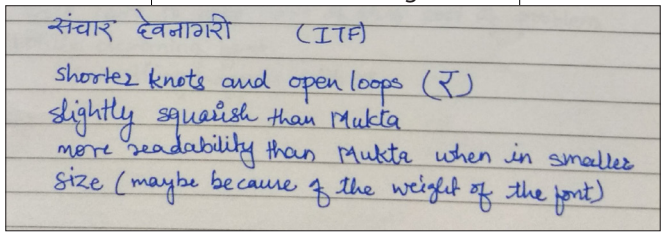
Image Source (Images 1- 4) : Mohanty, S. K. The Formulation of Parameters for Type Design of Indian Scripts

Image 5 : An example of Comparative Study of a few Monolinear Typefaces

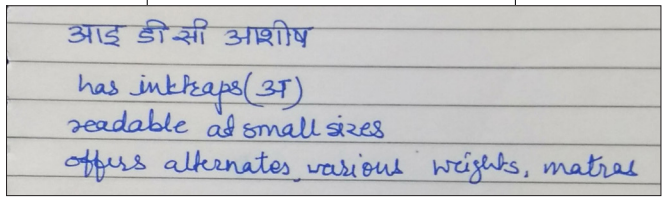
Mukta



Sanchar Devanagari



IDC Aashish



Font Sources:

Mukta: EkType

Sanchar Devanagari: Indian Type Foundry

IDC Aashish: Ashish Kumar, Designing A Monolinear Devanagari Font

Image 6: Sketching the Letters to come up with different designs

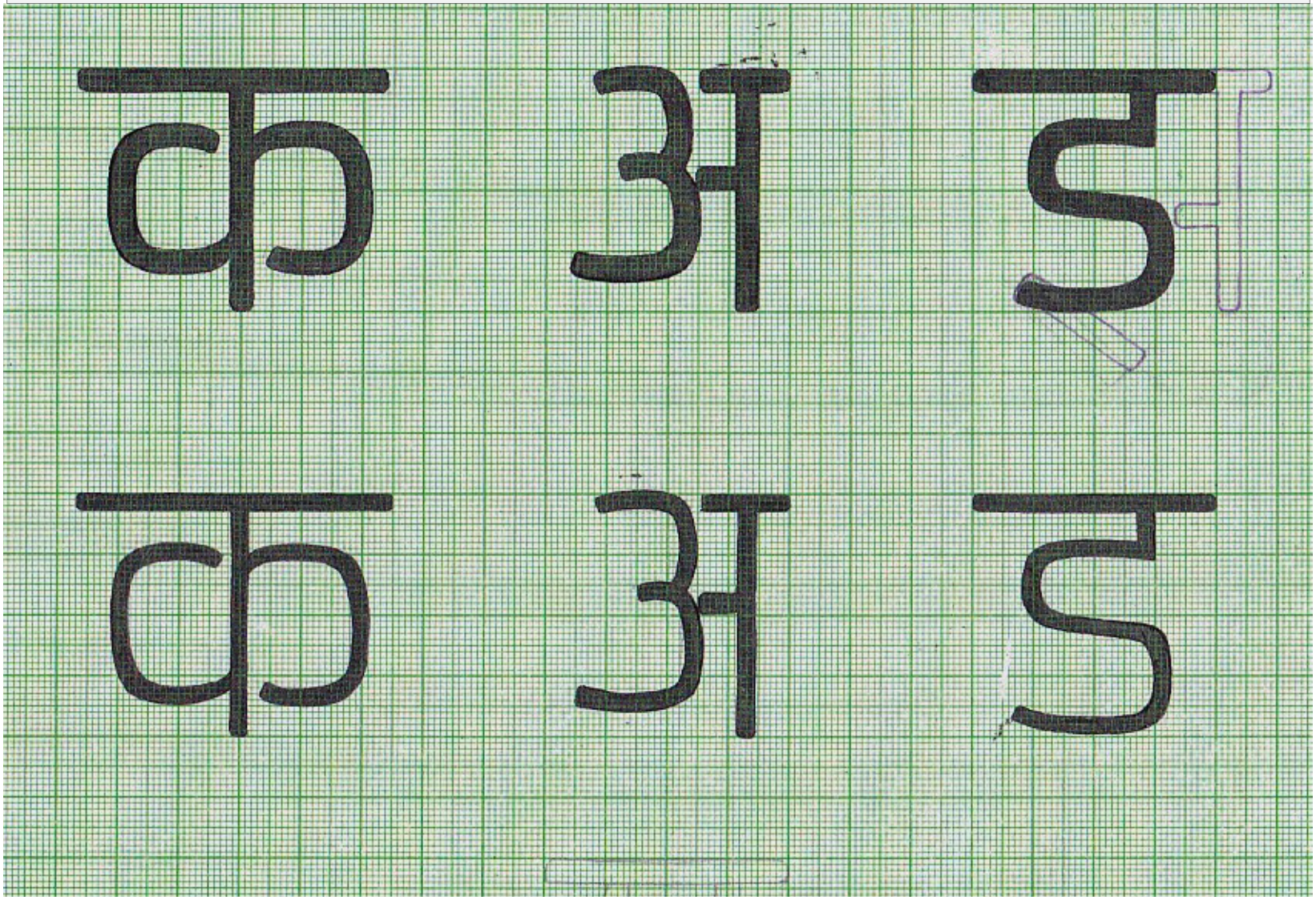


Image 7: Rendering the finalised designs in Illustrator

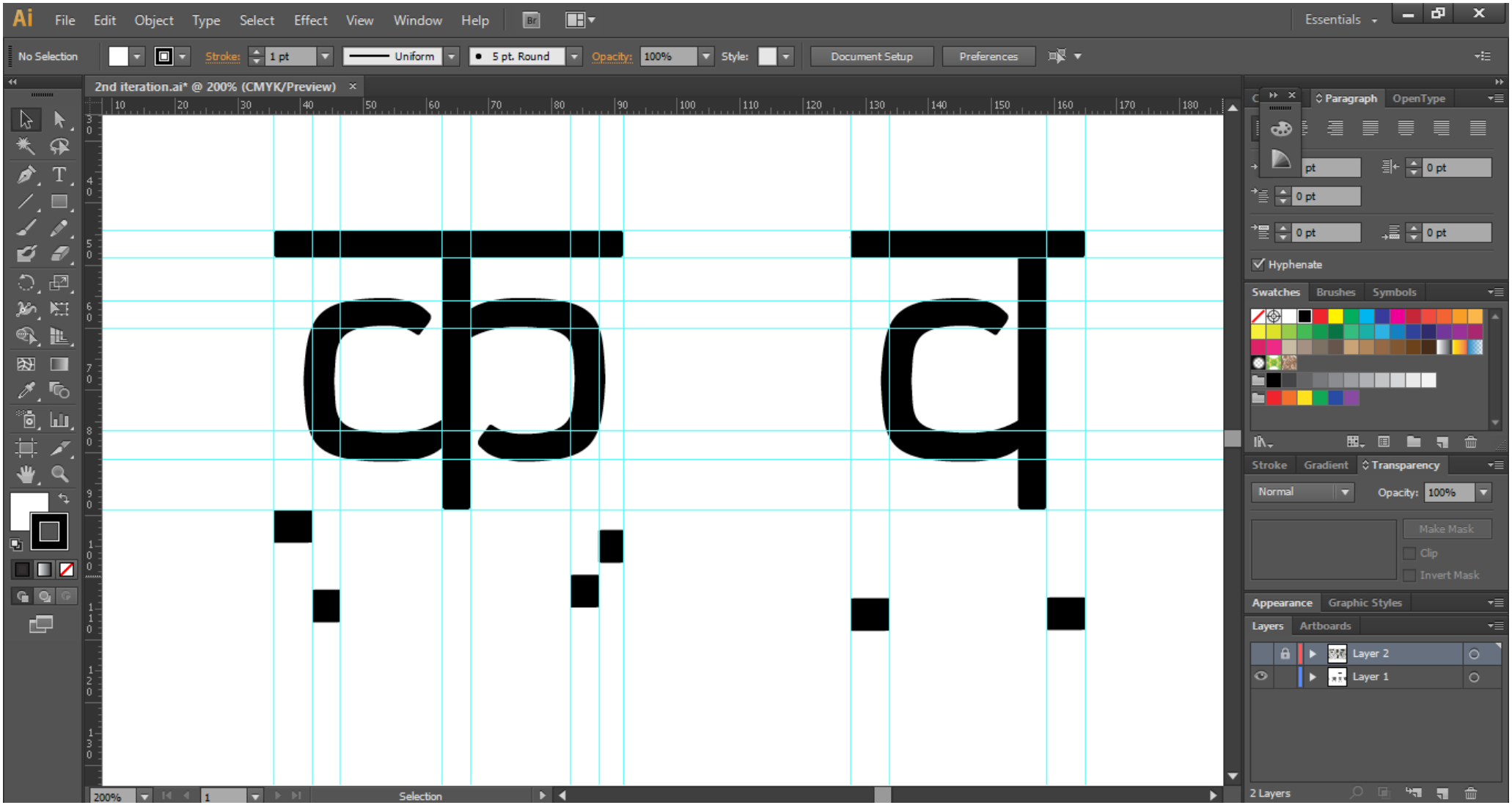


Image 7: Getting acquainted with FontLab Studio

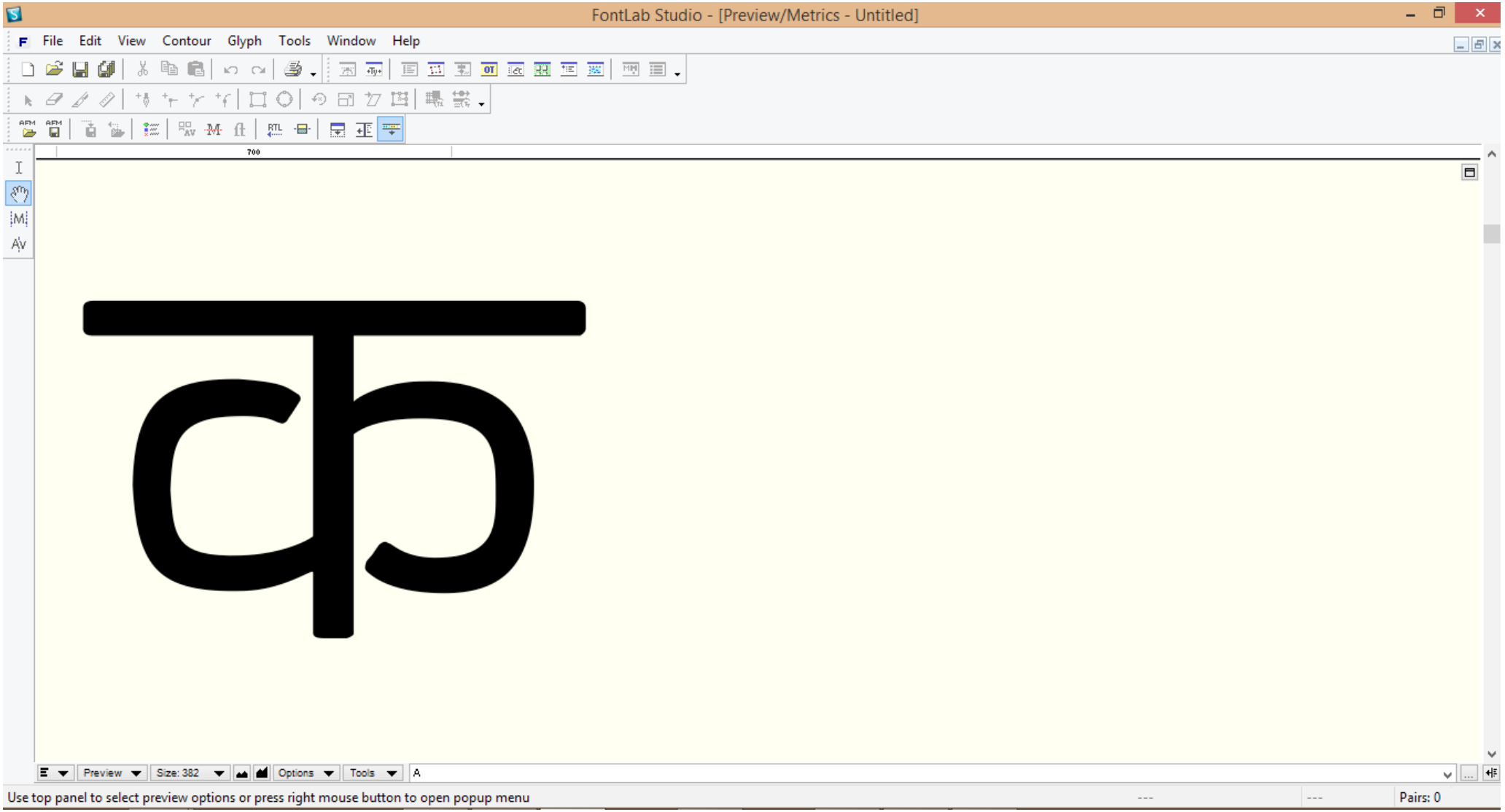


Image 8: Rendering Glyphs in FontLab

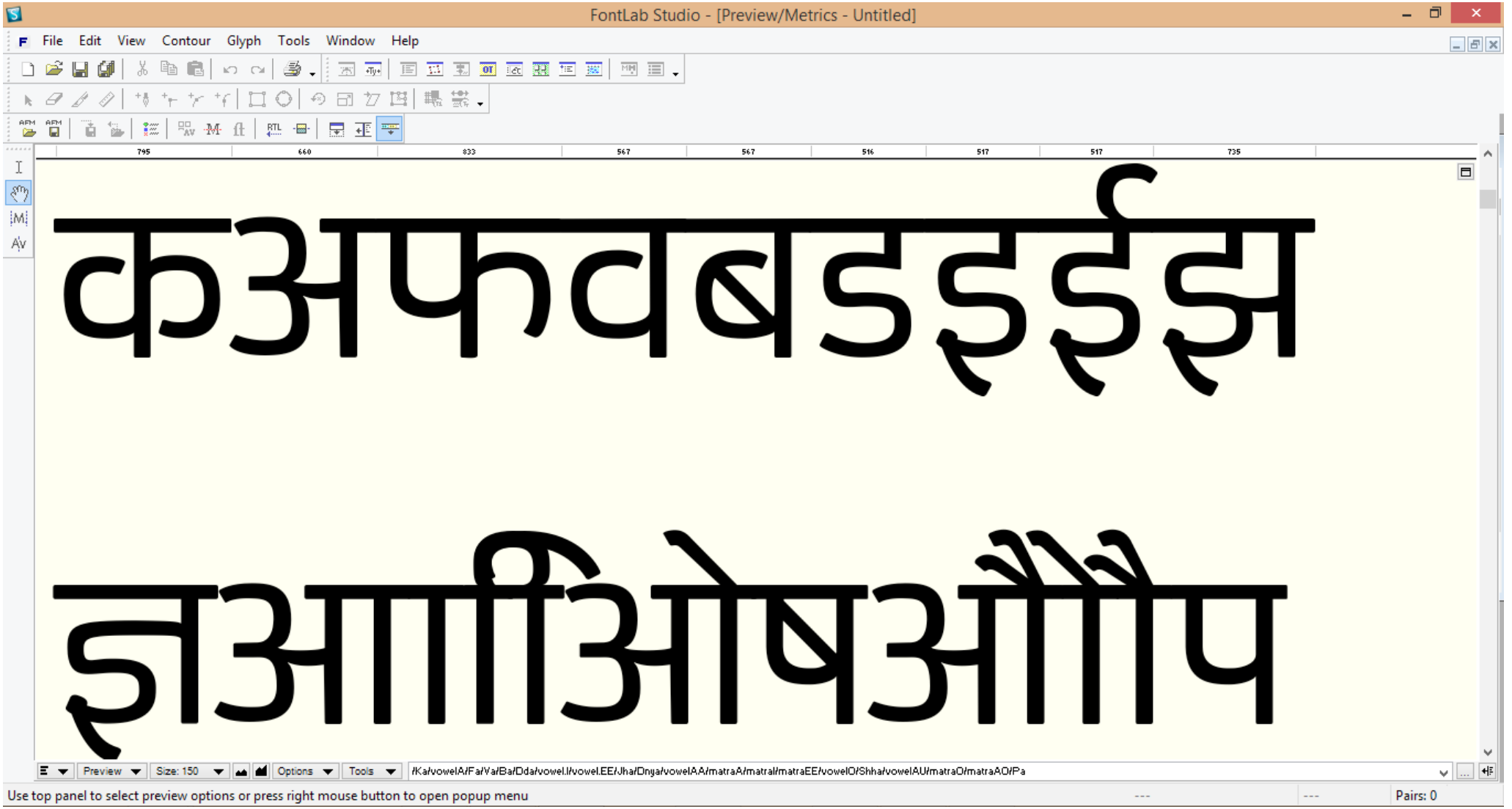


Image 9: Printing Samples

Font: Unnamed

06/19/18 09:07:58

String: A,a,C,c,E,F,K,P,V,Z,[,],;,z

Sizes: 10,15,20,25,30,35, 40, 42, 48, 56, 64, 72

10. अआओऔइफकपवझाैज्ञ

15. अआओऔइफकपवझाैज्ञ

20. अआओऔइफकपवझाैज्ञ

25. अआओऔइफकपवझाैज्ञ

30. अआओऔइफकपवझाैज्ञ

35. अआओऔइफकपवझाैज्ञ

40. अआओऔइफकपवझाैज्ञ

42. अआओऔइफकपवझाैज्ञ

48. अआओऔइफकपवझाैज्ञ

56. अआओऔइफकपवझाैज्ञ

64. अआओऔइफकपवझाैज्ञ

72. अआओऔइफकपवझाैज्ञ

Image 10: Analysing the Samples

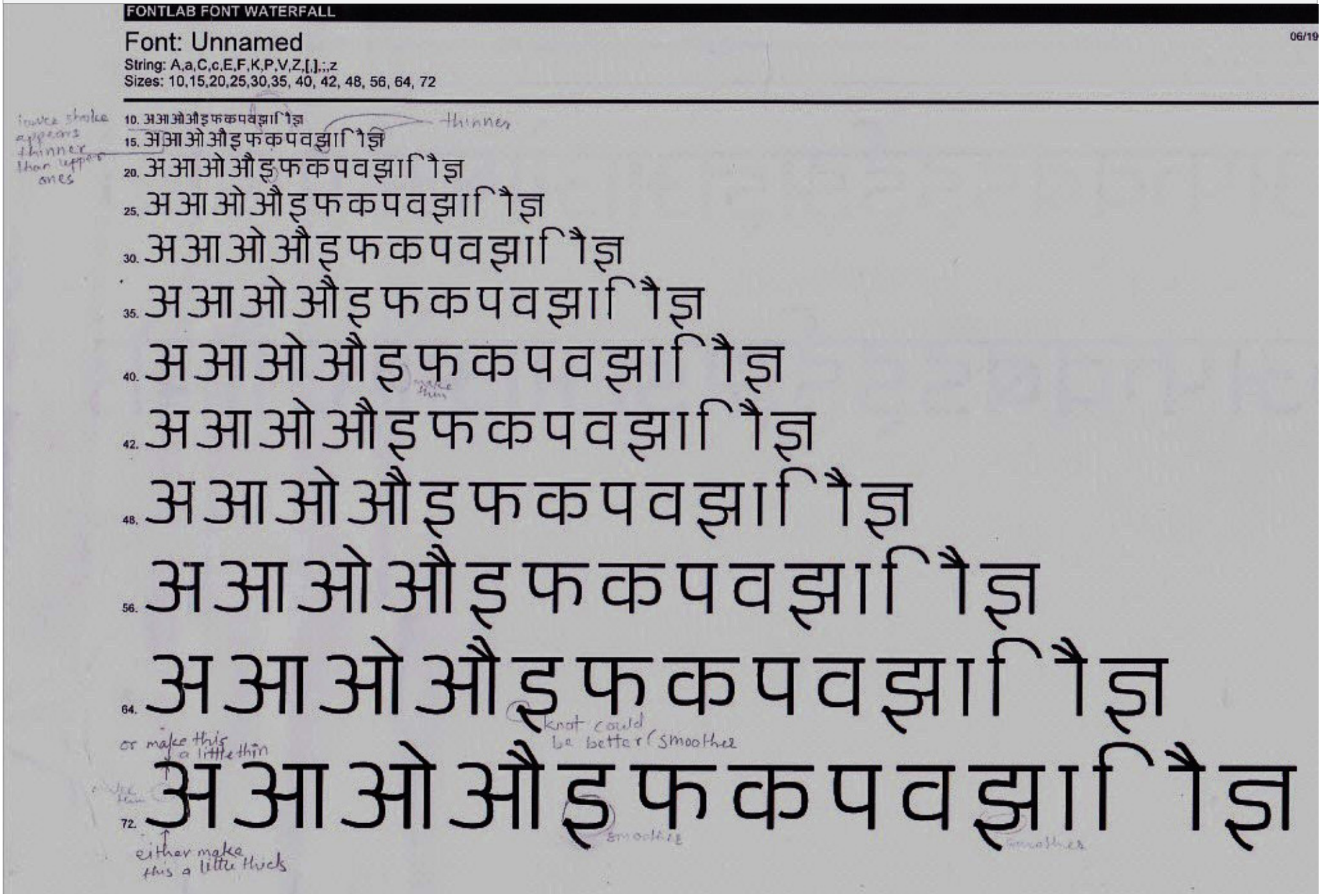


Image 11: Refining the glyphs and Printing samples

Font: Unnamed

06/20/18 18:20:19

String: /Ka/vowelA/Fa/Va/Ba/Dda/vowel.I/vowel.EE/Jha/Dnya/vowelAA/vowelO/Shha/vowelAU/Pa/matraO/Dda/matraI/Ka/matraAO/Dda/matraA/Pa/matraEE/Shha/matraEE

Sizes: 10,15,20,25,30,36, 40,48, 56, 64, 72

10. कअफवबडइईझज्ञआओषऔपोडकौडापीषी

15. कअफवबडइईझज्ञआओषऔपोडकौडापीषी

20. कअफवबडइईझज्ञआओषऔपोडकौडापीषी

25. कअफवबडइईझज्ञआओषऔपोडकौडापीषी

30. कअफवबडइईझज्ञआओषऔपोडकौडापीषी

36. कअफवबडइईझज्ञआओषऔपोडकौडापीषी

40. कअफवबडइईझज्ञआओषऔपोडकौडापीषी

48. कअफवबडइईझज्ञआओषऔपोडकौडापीषी

56. कअफवबडइईझज्ञआओषऔपोडकौडापी

Image 12: Working on making the glyph Ka variable

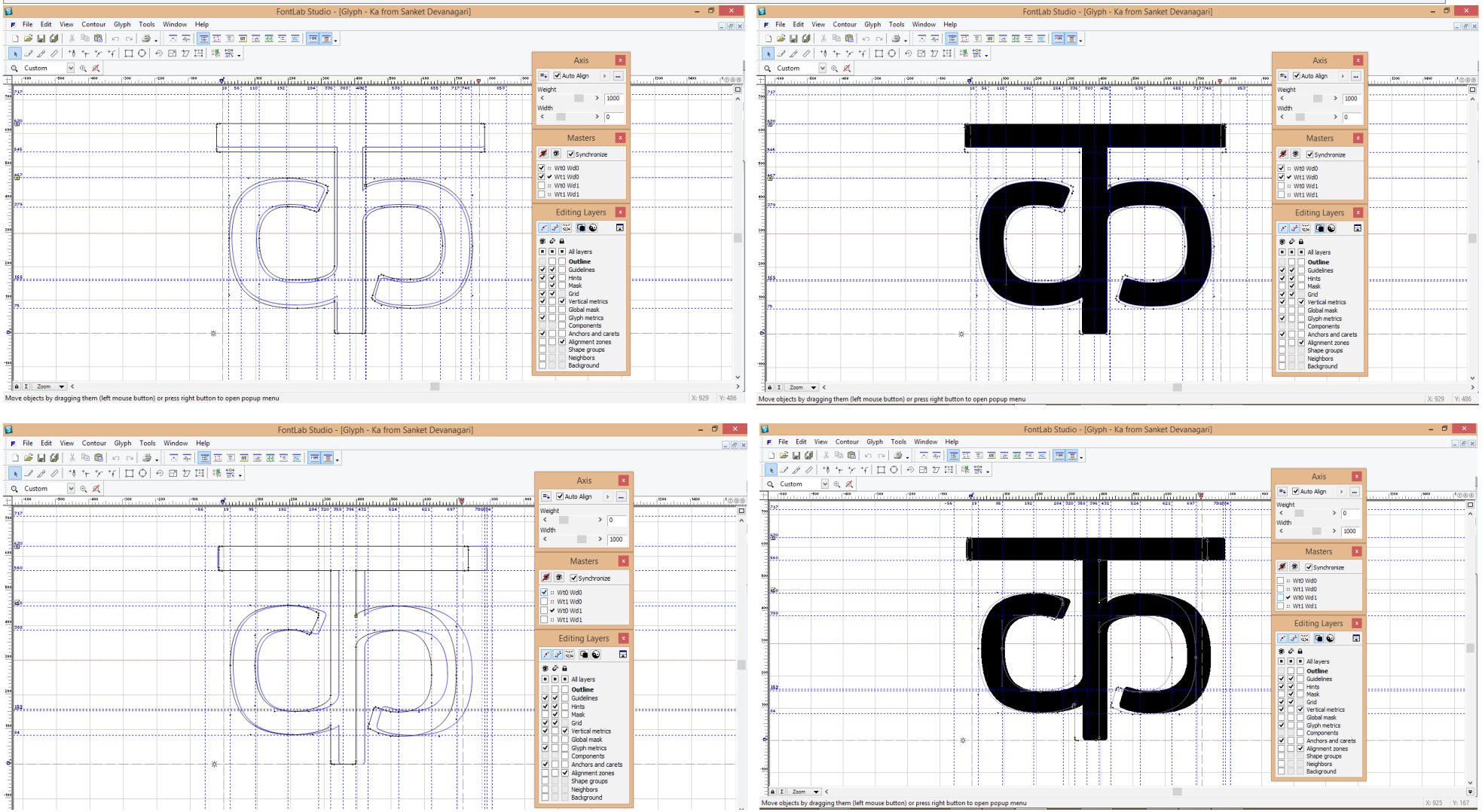
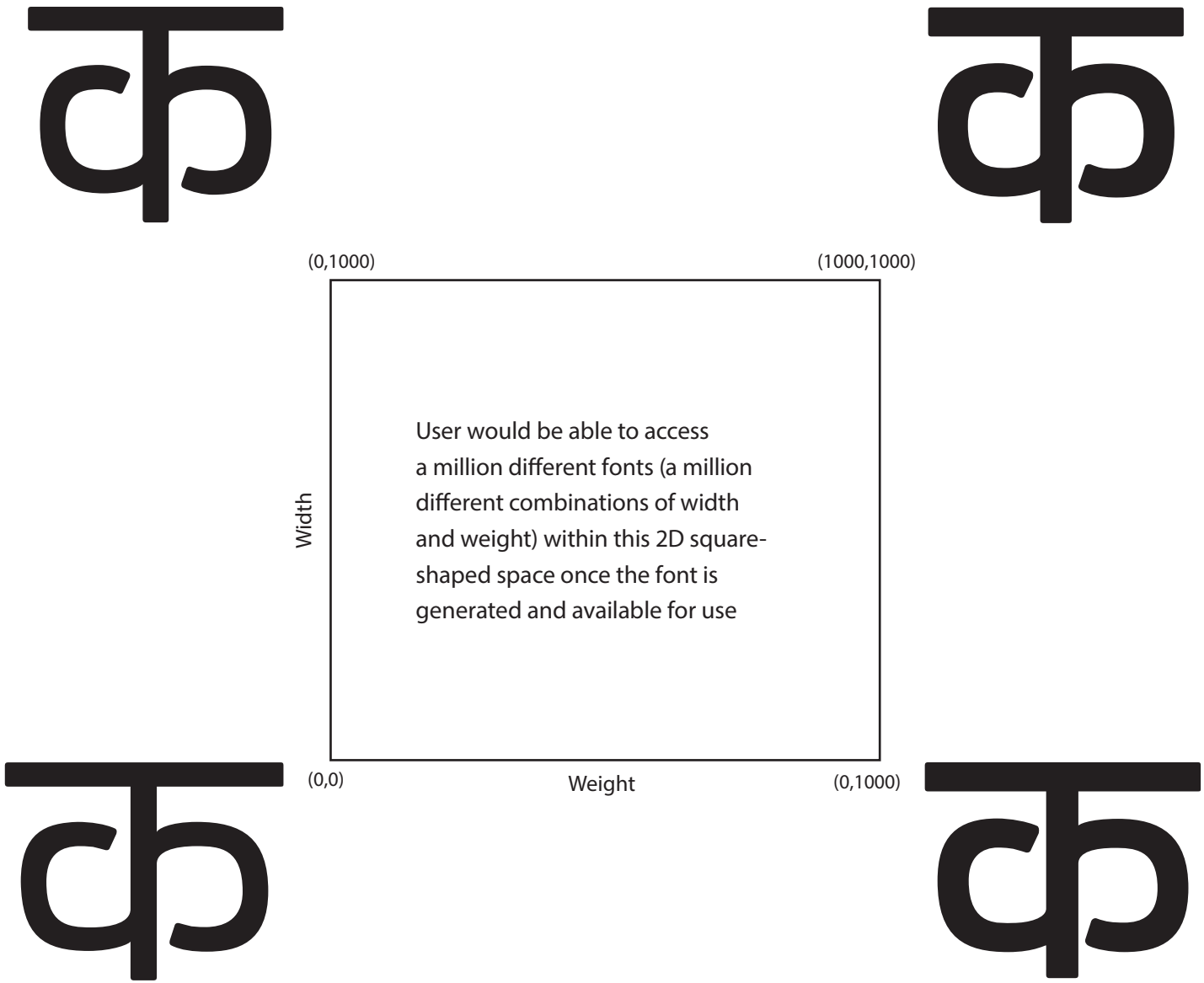


Image 13


(0,1000)
(1000,1000)
User would be able to access a million different fonts (a million different combinations of width and weight) within this 2D square-shaped space once the font is generated and available for use
Width
(0,0)
Weight
(0,1000)

Continuing the Project

As I proceeded with project, the approach towards design of glyphs became more systematic. The design process broadly involves following steps:

- Studying Anatomy of Devanagari Letterforms
- Creation of grid
- Further Classification of letters
- Identification of Primitives
- Identification of problems and further refinements
- Creating samples of Font
- Classification of characters according to width
- Kerning and spacing

Anatomy of Devanagari Letterforms

To have a system which depicts structure of letters, helps determine proportion, key features or primitives was necessary for Devanagari Type design process. Attempts to categorize Devanagari letters like Roman were started around 1961, notably by S. V. Bhagawat, followed by Bapurao Naik.

Mukund Gokhale created a vocabulary for Devanagari in 1975-76. Gokhale uses 'body' paradigm to describe the various proportion for Devanagari letter. The body is used as a reference for the vertical proportion of the letters.

He uses the thickness of pen stroke as the base unit. According to him—for upper matra sign we need minimum four stroke thickness, four strokes for bottom matra and eight strokes for the main characters. A total of sixteen strokes can be consider as a primary parameter for the total height. (See Image 14)

Image 14

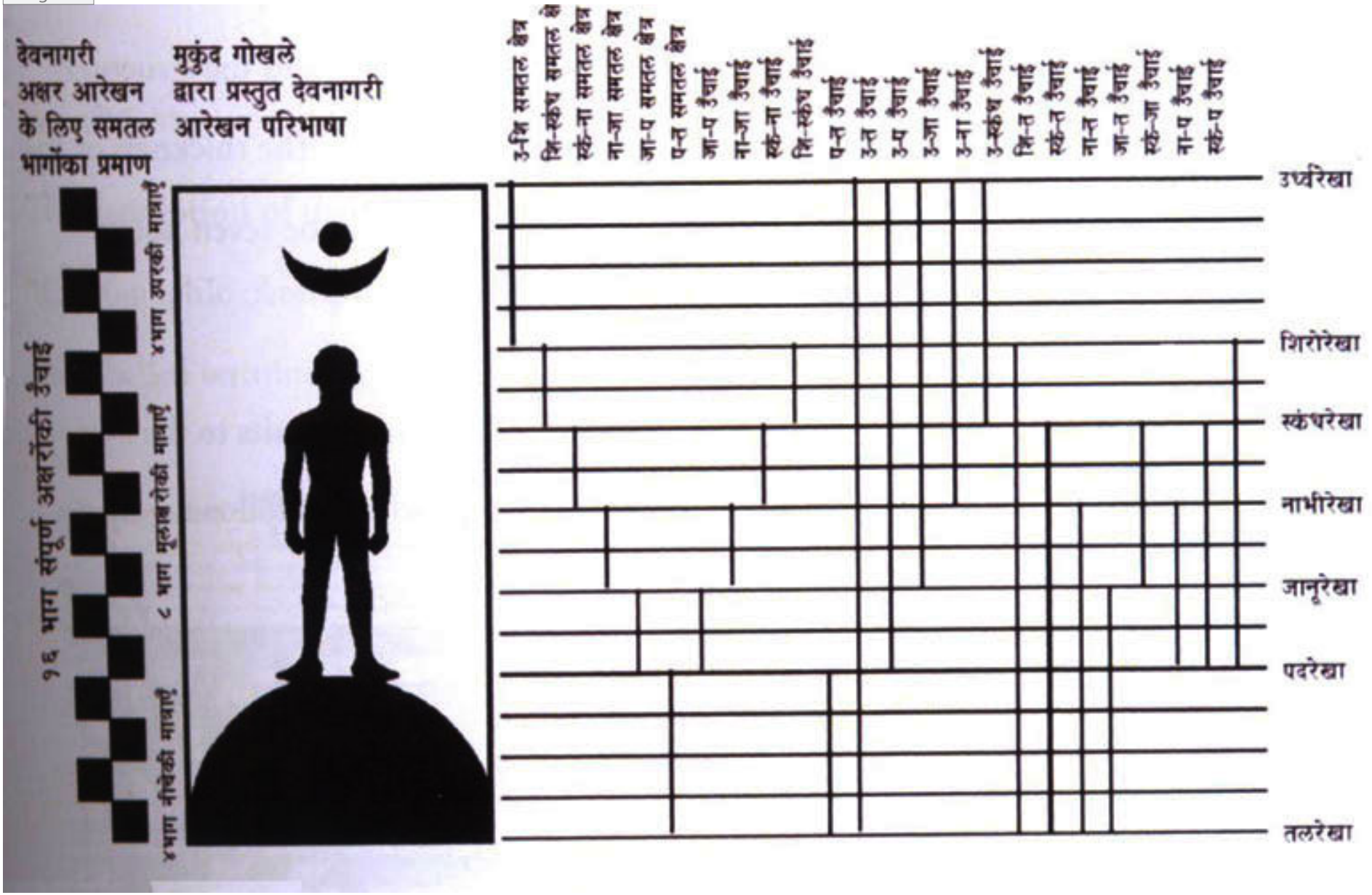


Image source: Dalvi, Girish. Conceptual mpodel for Devanagari typefaces.

Ratio between upper Matra (total length of first four stroke thickness from top), Kana height (total length of following eight stroke thickness) and lower Matra (total length of last four stroke thickness) is 0.5: 1: 0.5 as described by Ghokhale. (See Image 15)

Image 15

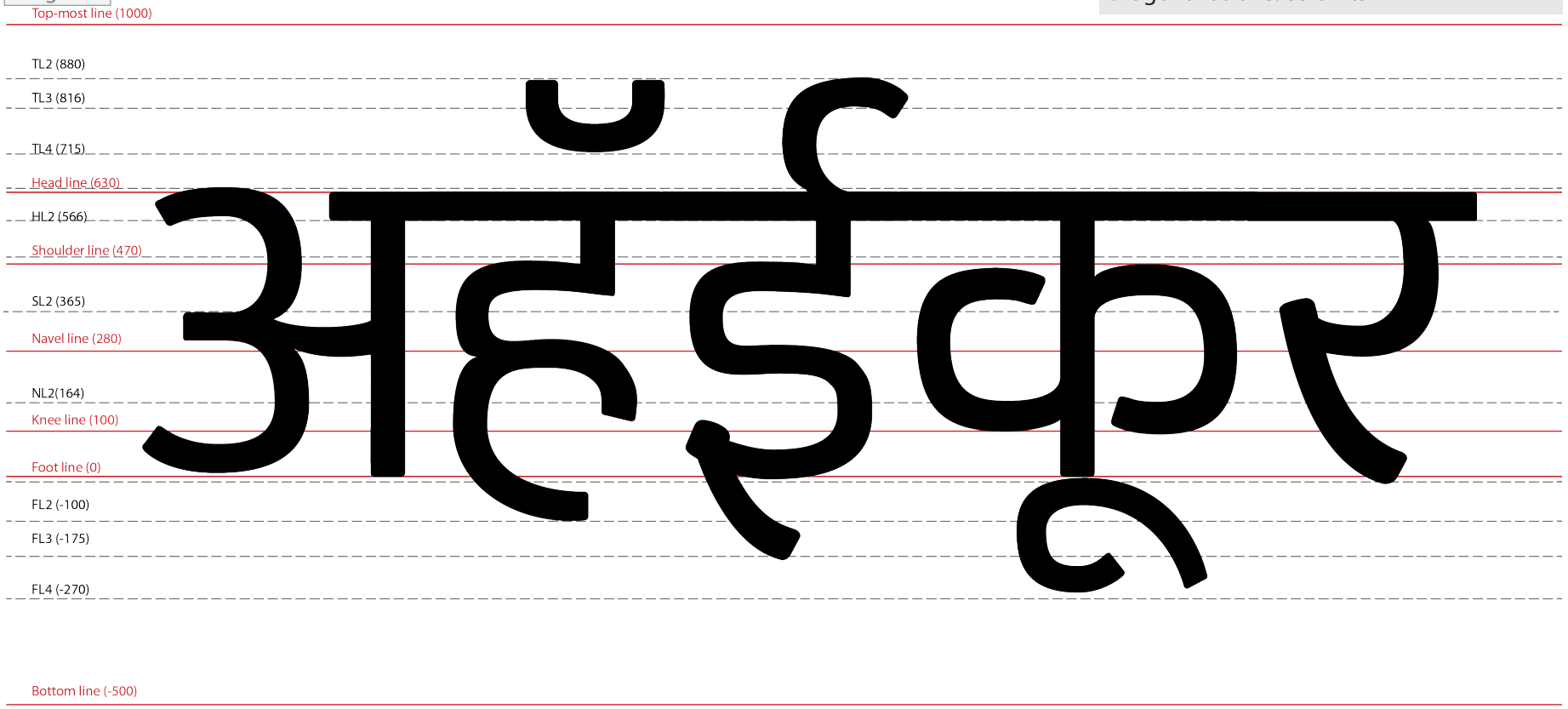
Image source: Dalvi, Girish. Conceptual mpodel for Devanagari typefaces.

Creating the Grid

In order to maintain the consistency in designs of glyphs, a uniform grid is necessary. After examining the letters designed so far and studying anatomy of Devanagari letterforms, following grid was created.

Horizontal Stroke (H): 64 units
Vertical Stroke (V): 76 units
V to H ratio: 1.1875
Diagonal Stroke: 65 units

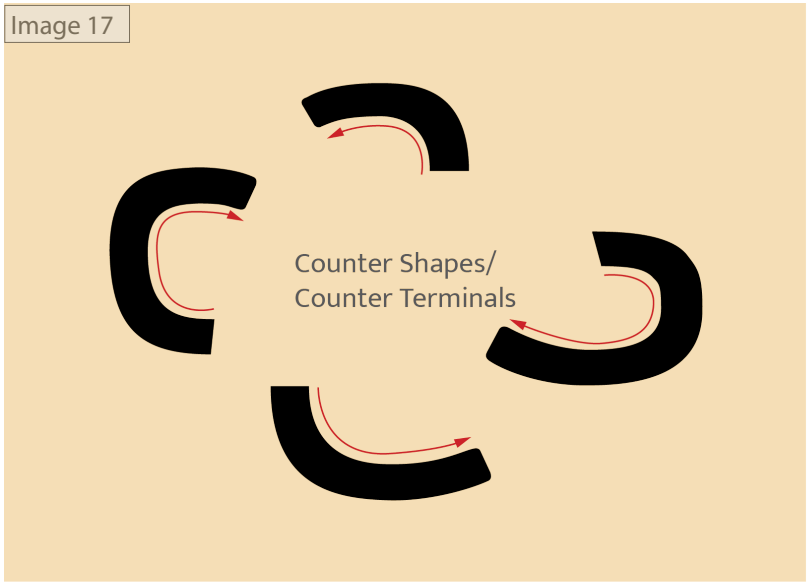
Image 16

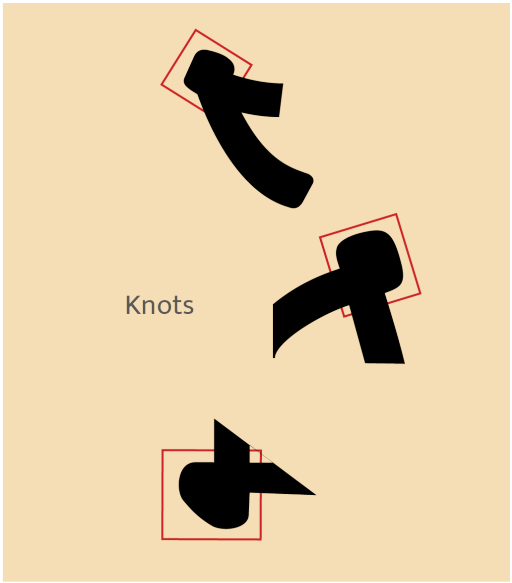


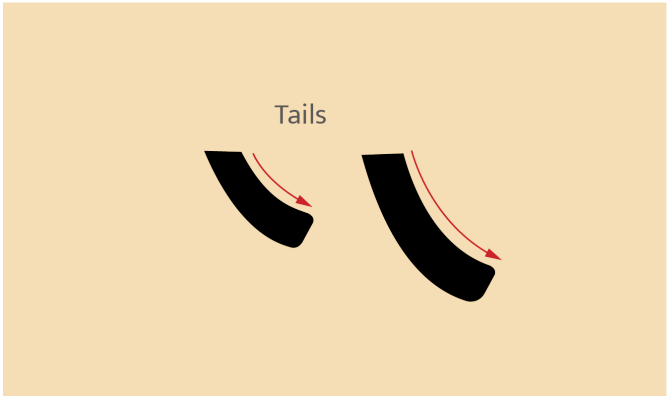
Identifying Primitives

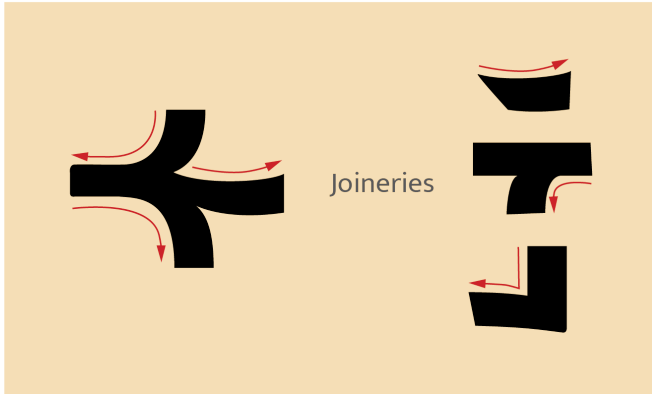
Determining primitives is essential to maintain the consistency in entire font. It helps in construction of every individual letter.
(See Image 17)

Image 17





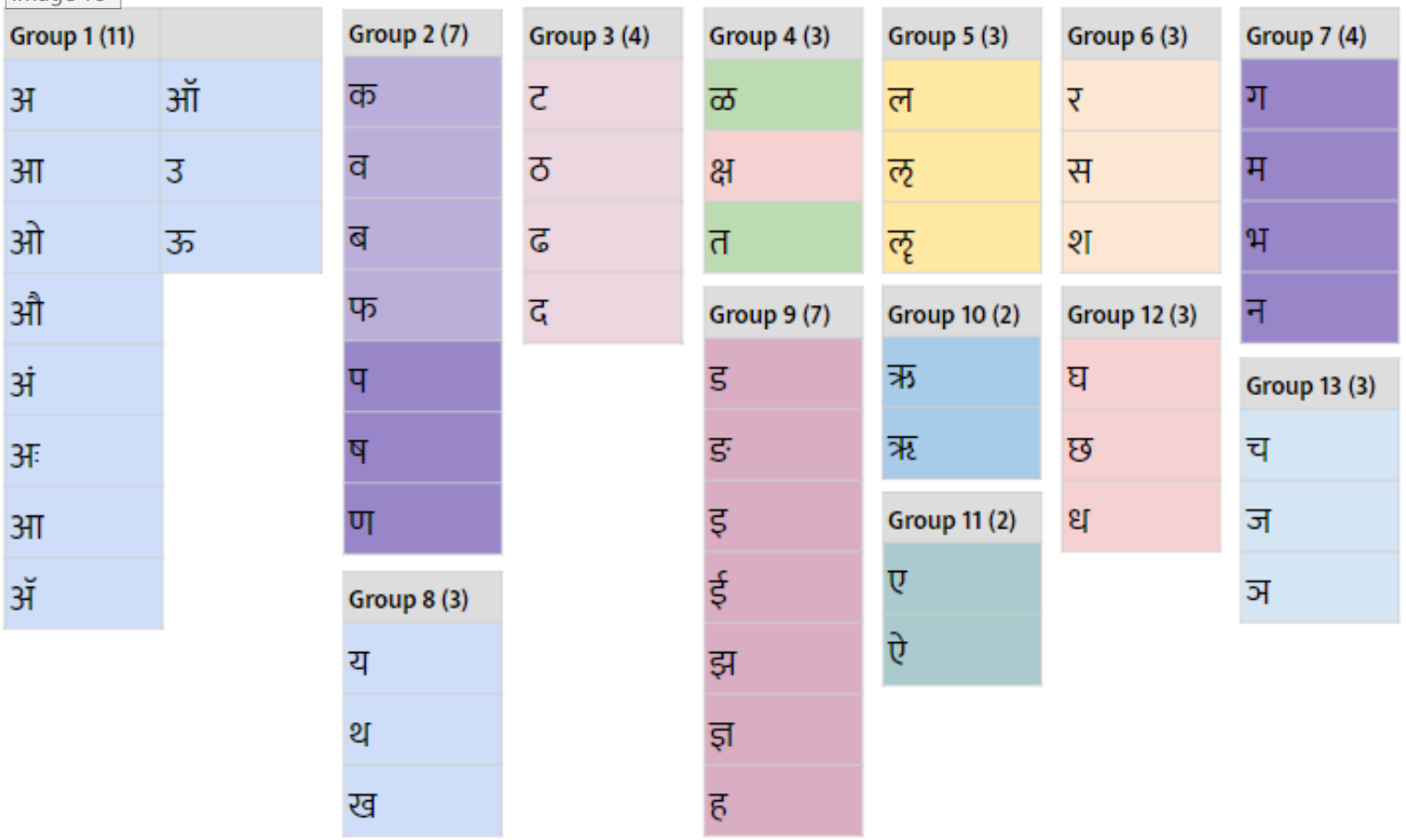




Classification of Letters

Letters were classified according to structural similarities after identification of primitives. (See Image 18)

Image 18



Refining Glyphs

Creation of grid and primitives led to some refinements of glyphs.
A few were very subtle, while a few were pretty evident.
(See Image 19)

Image 19

Glyphs designed so far

54 basic letters, 14 matras, 5 conjuncts

कअफवबडइईझज्ञआओषऔपए

अःऑॉॅछधघऐउअंऊऋलॠहस

थमरटष्ट्रङ॰तणठलृढदळक्षनभ

चजञयखशगप्रत्रस्थल्पद्यलृ

Creation of Samples of the Font

Samples are created in order to find the inconsistencies in the design of glyphs so that they can be rectified.

Sample 1

12 pt

माझं नाव संकेत आहे. संकेत कपूर गोंटे. मी एका देवनागरी टंकाचा अभिकल्प करत आहे. मी अभिकल्प विद्यालय, भारतीय प्रौद्योगिकी संस्थान,मुंबई येथे संप्रेषण अभिकल्प शिकतोय. श्रीकुमार सर माझे मार्गदर्शक आहेत.

24 pt

माझं नाव संकेत आहे. संकेत कपूर गोंटे. मी एका देवनागरी टंकाचा अभिकल्प करत आहे. मी अभिकल्प विद्यालय, भारतीय प्रौद्योगिकी संस्थान,मुंबई येथे संप्रेषण अभिकल्प शिकतोय. श्रीकुमार सर माझे मार्गदर्शक आहेत.

32 pt

माझं नाव संकेत आहे. संकेत कपूर गोंटे. मी एका देवनागरी टंकाचा अभिकल्प करत आहे. मी अभिकल्प विद्यालय, भारतीय प्रौद्योगिकी संस्थान,मुंबई येथे संप्रेषण अभिकल्प शिकतोय. श्रीकुमार सर माझे मार्गदर्शक आहेत.

48 pt

माझं नाव संकेत आहे. संकेत कपूर गोंटे. मी ए का देवनागरी टंकाचा अभिकल्प करत आहे. मी अभिकल्प विद्यालय, भारतीय प्रौद्योगिकी संस्था न,मुंबई येथे संप्रेषण अभिकल्प शिकतोय. श्रीकु मार सर माझे मार्गदर्शक आहेत.

Sample 2
32 pt

नंदिनी भोसले, हर्षिता बांदोडकर, शिवानी नायक, प्रियांका पूर्ती, प्रेम सोनार, संकेत गोंटे, मयुर चौरे, हसन कुमार गुंडू, पी. राजेश, सिद्धार्थ अरेडत, मृणाल बिश्बास, उन्मेष नायक, ईशू कर्दम

Further Scope

Process of type design takes a lot of hard work, patience and a lot of time. Working on this project helped me understand the type design process. However, further work can be done on refining the characters, designing the remaining ones, and testing with users.

To make it usable, font engineering for matra positioning, OTF encoding for conjunct ligatures and suitable hinting for on–screen needs to be done. Furthermore, the project can be aimed towards the design of full functioning typeface with at least 3 weights.

The font would be an addition to the group of Devanagari typefaces, help fill up the gap between the number of Latin and Devanagari typefaces.

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