

Gurmukhi Script LGR Proposal

Introduction, Current Analysis and Next Steps

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Introduction to Gurmukhi Script

- ⦿ Population: While there are 130 million speakers of the Punjabi language, Gurmukhi script is only used by Indian Punjabis, around 30 million speakers.
- ⦿ Geographical area: Gurmukhi is heavily used as a script in Northern India; particularly: Punjab, Haryana and Delhi.
- ⦿ Languages written in Gurmukhi script: Punjabi
- ⦿ The word Gurmukhi is the compound form of Guru (Master) and Mukh (Mouth). It is commonly translated as utterance from the Mouth of the Master.

Classification of Characters: Consonants

In Gurmukhi, all consonants have an implicit vowel sign schwa /ə/ within them. But these consonants are also used to represent consonant sounds where /ə/ vowel is not incorporated with them without any modification. As per traditional classification, consonants are categorized according to their phonetic properties.

Varga	Fricatives				
				Dental	Glottal
Mul Varga				ਸ U+0A38	ਰ U+0A39

Table 2: Mul varga

Non Varga	ਯ U+0A2 F	ਰ U+0A30	ਲ U+0A32	ਵ U+0A35	ੜ U+0A5C

Table 4: Non-Varga consonants

Pairim Bindi Varga	ਸ U+0A 36	ਖ U+0A5 9	ਗ U+0A5 A	ਜ U+0A5 B	ਫ U+0A5 E	ਲ U+0A3 3

Table 5: Pairr bindi consonants

Varga	Unvoiced		Voiced		Nasal
	_Asp	+Asp	_Asp	+Asp	
Velar	ਕ U+0A15	ਖ U+0A16	ਗ U+0A17	ਘ U+0A18	ਙ U+0A19
Palatal	ਚ U+0A1A	ਛ U+0A1B	ਜ U+0A1C	ਝ U+0A1D	ਞ U+0A1E
Retroflex	ਟ U+0A1F	ਠ U+0A20	ਡ U+0A21	ਢ U+0A22	ਣ U+0A23
Dental	ਤ U+0A24	ਥ U+0A25	ਦ U+0A26	ਧ U+0A27	ਨ U+0A28
Bi-labial	ਪ U+0A2A	ਫ U+0A2B	ਬ U+0A2C	ਭ U+0A2D	ਮ U+0A2E

Table 3: Varga classification of consonants

Classification of Characters: Vowels

Gurmukhi has ten vowels:

ਅ(ə) }
ਇ(I) } Short Vowels
ਉ(U) }

ਆ(a) }
ਈ(i) }
ਊ(u) } Long Vowels
ਏ(e) }
ਐ(ɛ) }
ਓ(o) }
ਔ(ɔ) }

To indicate a Vowel sound after a consonant other than the implicit one that is / ə /, a Vowel sign (Matra) is attached to the consonant. Since the consonant has a built in schwa, there are equivalent Matras for all vowels excepting the ਅ. So Punjabi has ten vowels but it has signs for only nine of them.

Classification of Characters: Matra

Gurmukhi script has three supra-segmental signs; bindi, tippi and adhak which are used with Gurmukhi vowel signs to represent the supra-segmental phonemes nasality, gemination and stress.

- ◉ Bindi (◌̣-U+0A02)

Represents a homo-organic nasal and is used with the Mātrās of long vowels/ ਾ, ੀ, ੇ, ੈ, ੋ, ੌ as – ਰਾਂ, ਟੀਂ, ਪੇਂਟ, ਦੈਂਤ, ਤੇਂ, ਜੇਂ. and with Mātrās of ੁ and ੂ only when used with ਓ vowel carrier as ਉਂ and ਉਂ like in words - ਉਂਗਲ, ਉਂਘ.

- ◉ Tippi (◌̣̣-U+0A70)

Used to nasalize short vowels /ə/ and /i/ at all places and /U, and u/ after a consonant as - ਅੰਗ ਇੰਜ ਲੰਘ ਹੁੰਦਾ ਬੂੰਦ . Also used in gemination for nasal consonants ਙ, ਞ, ਨ and ਮ as - ਬੰਨ੍ਹ ਥੰਮ.

- ◉ Addak (◌̣̣̣-U+0A71)

Usually comes with mukta, aunkar (ੁ) and sihari (ਿ), the vowel signs of /ə, u and i/ and short vowels and geminates the consonant which follows it. Examples - ਅੰਗ ਇੱਕ ਲੱਗ ਮੁੱਕਾ

Repertoire Included - 1

Sr. No.	Unicode Code Point	Glyph	Character Name	Unicode General Category (gc)	Indic Syllabic Category	Reference	Wide spread used? (Y/N)
1.	0A05	ਅ	GURMUKHI LETTER A =aira	Lo	Vowel/Vowel Carrier	[INSCRIPT]	Y
2.	0A06	ਆ	GURMUKHI LETTER AA	Lo	Vowel	[INSCRIPT]	Y
3.	0A07	ਇ	GURMUKHI LETTER I	Lo	Vowel	[INSCRIPT]	Y
4.	0A08	ਈ	GURMUKHI LETTER II	Lo	Vowel	[INSCRIPT]	Y
5.	0A09	ਉ	GURMUKHI LETTER U	Lo	Vowel	[INSCRIPT]	Y
6.	0A0A	ਊ	GURMUKHI LETTER UU	Lo	Vowel	[INSCRIPT]	Y
7.	0A0F	ਏ	GURMUKHI LETTER EE	Lo	Vowel	[INSCRIPT]	Y
8.	0A10	ਐ	GURMUKHI LETTER AI	Lo	Vowel	[INSCRIPT]	Y
9.	0A13	ਓ	GURMUKHI LETTER OO	Lo	Vowel	[INSCRIPT]	Y
10.	0A14	ਔ	GURMUKHI LETTER AU	Lo	Vowel	[INSCRIPT]	Y

Repertoire Included - 2

Sr. No.	Unicode Code Point	Glyph	Character Name	Unicode General Category (gc)	Indic Syllabic Category	Reference	Wide spread used? (Y/N)
11.	0A38	ਸ	GURMUKHI LETTER SA	Lo	Consonant	[INSCRIPT]	Y
12.	0A39	ਹ	GURMUKHI LETTER HA	Lo	Consonant	[INSCRIPT]	Y
13.	0A15	ਕ	GURMUKHI LETTER KA	Lo	Consonant	[INSCRIPT]	Y
14.	0A16	ਖ	GURMUKHI LETTER KHA	Lo	Consonant	[INSCRIPT]	Y
15.	0A17	ਗ	GURMUKHI LETTER GA	Lo	Consonant	[INSCRIPT]	Y
16.	0A18	ਘ	GURMUKHI LETTER GHA	Lo	Consonant	[INSCRIPT]	Y
17.	0A19	ਙ	GURMUKHI LETTER NGA	Lo	Consonant	[INSCRIPT]	N
18.	0A1A	ਚ	GURMUKHI LETTER CA	Lo	Consonant	[INSCRIPT]	Y
19.	0A1B	ਛ	GURMUKHI LETTER CHA	Lo	Consonant	[INSCRIPT]	Y
20.	0A1C	ਜ	GURMUKHI LETTER JA	Lo	Consonant	[INSCRIPT]	Y

Repertoire Included - 3

Sr. No	Unicode Code Point	Glyph	Character Name	Unicode General Category (gc)	Indic Syllabic Category	Reference	Wide spread used? (Y/N)
21.	0A1D	ਝ	GURMUKHI LETTER JHA	Lo	Consonant	[INSCRIPT]	Y
22.	0A1E	ਞ	GURMUKHI LETTER NYA	Lo	Consonant	[INSCRIPT]	N
23.	0A1F	ਟ	GURMUKHI LETTER TTA	Lo	Consonant	[INSCRIPT]	Y
24.	0A20	ਠ	GURMUKHI LETTER TTHA	Lo	Consonant	[INSCRIPT]	Y
25.	0A21	ਡ	GURMUKHI LETTER DDA	Lo	Consonant	[INSCRIPT]	Y
26.	0A22	ਢ	GURMUKHI LETTER DDHA	Lo	Consonant	[INSCRIPT]	Y
27.	0A23	ਣ	GURMUKHI LETTER NNA	Lo	Consonant	[INSCRIPT]	Y
28.	0A24	ਤ	GURMUKHI LETTER TA	Lo	Consonant	[INSCRIPT]	Y
29.	0A25	ਥ	GURMUKHI LETTER THA	Lo	Consonant	[INSCRIPT]	Y
30.	0A26	ਦ	GURMUKHI LETTER DA	Lo	Consonant	[INSCRIPT]	Y

Repertoire Included - 4

Sr. No	Unicode Code Point	Glyph	Character Name	Unicode General Category (gc)	Indic Syllabic Category	Reference	Wide spread used? (Y/N)
31.	0A27	ਧ	GURMUKHI LETTER DHA	Lo	Consonant	[INSCRIPT]	Y
32.	0A28	ਨ	GURMUKHI LETTER NA	Lo	Consonant	[INSCRIPT]	Y
33.	0A2A	ਪ	GURMUKHI LETTER PA	Lo	Consonant	[INSCRIPT]	Y
34.	0A2B	ਫ	GURMUKHI LETTER PHA	Lo	Consonant	[INSCRIPT]	Y
35.	0A2C	ਬ	GURMUKHI LETTER BA	Lo	Consonant	[INSCRIPT]	Y
36.	0A2D	ਭ	GURMUKHI LETTER BHA	Lo	Consonant	[INSCRIPT]	Y
37.	0A2E	ਮ	GURMUKHI LETTER MA	Lo	Consonant	[INSCRIPT]	Y
38.	0A2F	ਯ	GURMUKHI LETTER YA	Lo	Consonant	[INSCRIPT]	Y
39.	0A30	ਰ	GURMUKHI LETTER RA	Lo	Consonant	[INSCRIPT]	Y
40.	0A32	ਲ	GURMUKHI LETTER LA	Lo	Consonant	[INSCRIPT]	Y

Repertoire Included - 5

Sr. No	Unicode Code Point	Glyph	Character Name	Unicode General Category (gc)	Indic Syllabic Category	Reference	Wide spread used? (Y/N)
41.	0A35	ਵ	GURMUKHI LETTER VA	Lo	Consonant	[INSCRIPT]	Y
42.	0A5C	ੜ	GURMUKHI LETTER RRA	Lo	Consonant	[INSCRIPT]	Y
43.	0A3E	ਾ	GURMUKHI VOWEL SIGN kanna	Mc	Matra	[INSCRIPT]	Y
44.	0A3F	ਿ	GURMUKHI VOWEL SIGN sihari	Mc	Nukta	[INSCRIPT]	Y
45.	0A40	ੀ	GURMUKHI VOWEL SIGN bihari	Mc	Matra	[INSCRIPT]	Y
46.	0A41	ੁ	GURMUKHI VOWEL SIGN aunkar	Mn	Matra	[INSCRIPT]	Y
47.	0A42	ੂ	GURMUKHI VOWEL SIGN dulainkar	Mn	Matra	[INSCRIPT]	Y
48.	0A47	ੇ	GURMUKHI VOWEL SIGN lanvan	Mn	Matra	[INSCRIPT]	Y
49.	0A48	ੈ	GURMUKHI VOWEL SIGN dulavan	Mn	Matra	[INSCRIPT]	Y
50.	0A4B	ੌ	GURMUKHI VOWEL SIGN hora	Mn	Matra	[INSCRIPT]	Y

Repertoire Included - 6

Sr. No	Unicode Code Point	Glyph	Character Name	Unicode General Category (gc)	Indic Syllabic Category	Reference	Wide spread used? (Y/N)
51.	0A4C	ੴ	GURMUKHI VOWEL SIGN kanaura	Mn	Matra	[INSCRIPT]	Y
52.	0A02	ੴ	GURMUKHI SIGN BINDI	Mn	Matra	[INSCRIPT]	Y
53.	0A70	ੴ	GURMUKHI SIGN TIPPI	Mn	Matra	[INSCRIPT]	Y
54.	0A71	ੴ	GURMUKHI SIGN ADDAK	Mn	Matra	[INSCRIPT]	Y
55.	0A4D	ੴ	GURMUKHI SIGN VIRAMA	Mc	Virama/ Halant	[INSCRIPT]	Y
56.	0A3C	ੴ	GURMUKHI SIGN NUKTA = pairin bindi	Mn	Nukta	[INSCRIPT]	Y

Repertoire Excluded

- Code Points in MSR-2 but excluded because they are either not in common use or used for special purpose only (Used as vowel carrier):

Code Point	Glyph	Type	Notes
0A03	◌◌	GURMUKHI SIGN VISARGA	Limited or declining use
0A51	◌	GURMUKHI SIGN UDAAT	Limited or declining use
0A72	ੲ	GURMUKHI IRI	Does not occur alone
0A73	ੳ	GURMUKHI URA	Does not occur alone
0A75	◌	GURMUKHI SIGN YAKASH	Limited or declining use

	0A0	0A1	0A2	0A3	0A4	0A5	0A6	0A7
0		ਐ 0A10	ਠ 0A20	ਰ 0A30	ੀ 0A40			ੰ 0A70
1	ੳ 0A01		ਡ 0A21		ੳ 0A41	ੳ 0A51		ੱ 0A71
2	ਂ 0A02		ਢ 0A22	ਲ 0A32	ੳ 0A42			ੲ 0A72
3	ੰ 0A03	ੳ 0A13	ਣ 0A23	ਲ 0A33				ੳ 0A73
4		ਐ 0A14	ਤ 0A24					ੳ 0A74
5	ਅ 0A05	ਕ 0A15	ਬ 0A25	ਵ 0A35				ੳ 0A75
6	ਆ 0A06	ਖ 0A16	ਦ 0A26	ਸ਼ 0A36			ੳ 0A66	
7	ਇ 0A07	ਗ 0A17	ਧ 0A27		ੇ 0A47		ੳ 0A67	
8	ਈ 0A08	ਘ 0A18	ਨ 0A28	ਸ 0A38	ੈ 0A48		ੳ 0A68	
9	ਉ 0A09	ਙ 0A19		ਹ 0A39		ਖ 0A59	ੳ 0A69	
A	ੳ 0A0A	ਚ 0A1A	ਪ 0A2A			ਗ 0A5A	ੳ 0A6A	
B		ਛ 0A1B	ਫ 0A2B		ੳ 0A4B	ਜ਼ 0A5B	ੳ 0A6B	
C		ਜ 0A1C	ਬ 0A2C	ੳ 0A3C	ੳ 0A4C	ੳ 0A5C	ੳ 0A6C	
D		ਝ 0A1D	ਞ 0A2D		ੳ 0A4D		ੳ 0A6D	
E		ਞ 0A1E	ਮ 0A2E	ਾ 0A3E		ਫ 0A5E	ੳ 0A6E	
F	ੳ 0A0F	ਟ 0A1F	ਯ 0A2F	ਿ 0A3F			ੳ 0A6F	

	0A0	0A1	0A2	0A3	0A4	0A5	0A6	0A7
0		ਐ 0A10	ਠ 0A20	ਰ 0A30	ੀ 0A40			ੰ 0A70
1	ੳ 0A01		ਡ 0A21		ੳ 0A41	ੳ 0A51		ੱ 0A71
2	ਂ 0A02		ਢ 0A22	ਲ 0A32	ੳ 0A42			ੲ 0A72
3	ੰ 0A03	ੳ 0A13	ਣ 0A23	ਲ 0A33				ੳ 0A73
4		ਐ 0A14	ਤ 0A24					ੳ 0A74
5	ਅ 0A05	ਕ 0A15	ਬ 0A25	ਵ 0A35				ੳ 0A75
6	ਆ 0A06	ਖ 0A16	ਦ 0A26	ਸ਼ 0A36			ੳ 0A66	
7	ਇ 0A07	ਗ 0A17	ਧ 0A27		ੇ 0A47		ੳ 0A67	
8	ਈ 0A08	ਘ 0A18	ਨ 0A28	ਸ 0A38	ੈ 0A48		ੳ 0A68	
9	ਉ 0A09	ਙ 0A19		ਹ 0A39		ਖ 0A59	ੳ 0A69	
A	ੳ 0A0A	ਚ 0A1A	ਪ 0A2A			ਗ 0A5A	ੳ 0A6A	
B		ਛ 0A1B	ਫ 0A2B		ੳ 0A4B	ਜ਼ 0A5B	ੳ 0A6B	
C		ਜ 0A1C	ਬ 0A2C	ੳ 0A3C	ੳ 0A4C	ੳ 0A5C	ੳ 0A6C	
D		ਝ 0A1D	ਞ 0A2D		ੳ 0A4D		ੳ 0A6D	
E		ਞ 0A1E	ਮ 0A2E	ਾ 0A3E		ਫ 0A5E	ੳ 0A6E	
F	ੳ 0A0F	ਟ 0A1F	ਯ 0A2F	ਿ 0A3F			ੳ 0A6F	

Within Script Variants for Gurmukhi - 1

- List of code points which are variants
Group 1: Visually similar Gurmukhi characters

Code Point 1 + Glyph 1	Code Point 2 + Glyph 2	Type (allocatable or blocked)
ਟ (0A1F)	ਦ (0A26)	
ਬ (0A2C)	ਥ (0A25)	
ਚ (0A1A)	ਰ (0A30)	
ਢ (0A22)	ਦ (0A26)	
ਢ (0A22)	ਫ (0A2B)	
ਤ (0A24)	ਭ (0A2D)	
ੇ (0A47)	ੈ (0A4B)	

Within Script Variants for Gurmukhi - 2

- List of code points which are variants
Group 2: visually similar Gurmukhi character combinations, due to presence dots and other characters

Code Point 1 + Glyph 1	Code Point 2 + Glyph 2	Type(allocatable or blocked)
ਖ (0A16 + 0A3C)	ਖ (0A16)	They are not identical therefore the GP decided they are not variants.
ਗ (0A17 + 0A3C)	ਗ (0A17)	
ਫ (0A2B + 0A3C)	ਫ (0A2B)	
ਓ (0A13 + 0A02)	ਓ (0A13)	
ਈ (0A08 + 0A02)	ਈ (0A08)	
ਐ (0A10 + 0A02)	ਐ (0A10)	
ਐ (0A14 + 0A02)	ਐ (0A14)	
ਗੰ (0A17 + 0A70)	ਗੀ (0A30 + 0A40)	
ਨੁ (0A28 + 0A41)	ਠ (0A20)	

Cross-Script Variants for Gurmukhi and Devanagari

Code Point 1 + Glyph 1	Code Point 2 + Glyph 2	Type(blocked)
ਕ (0A15)	र (0930)	blocked
ਗ (0A17)	ग (0917)	blocked
ਫ (0A2B)	ढ (0922)	blocked
ਤ (0A24)	उ (0909)	blocked
ਟ (0A1F)	ट (091F)	blocked
ਠ (0A20)	ठ (0920)	blocked
ਸ (0A38)	म (092E)	blocked
ਖ (0A2E)	भ (092D)	blocked
ਧ (0A27)	य (092F)	blocked
ੰ (0A02)	ं (0902)	blocked
ਿ (0A3F)	ि (093F)	blocked
ੀ (0A40)	ी (0940)	blocked
ੇ (0A47)	े (0947)	blocked
ੈ (0A48)	ै (0948)	blocked

Whole Label Evaluation Rules (in plain English) - 1

C	→	Consonant
M	→	Matra
V	→	Vowel
B	→	Bindi
D	→	Tippi
H	→	Halant / Virama
N	→	Nukta
S	→	{ ि(U+0A3F), ु(U+0A41) } (Short matras)
L	→	M - S (Long matras)
T	→	{ ऋ (U+0A05), ॠ (U+0A0F), ॡ (U+0A09) } (Short Vowels)
U	→	V - T (Long Vowel)

Whole Label Evaluation Rules (in plain English)

- ⦿ Rule 1: N must be preceded only by a specific set of Cs
- ⦿ Rule 2: H must be preceded by C or CN and followed by specified Cs only
- ⦿ Rule 3: M must be preceded by C or CN
- ⦿ Rule 4: B must be preceded by specific V or M
- ⦿ Rule 5: D must be preceded by, C, N or a specified set of Vs or Ms
- ⦿ Rule 6: A must be preceded by C, N or specific V or M

Whole Label Evaluation Rules (in plain English)

- **Rule 1: N must be preceded only by a specific set of Cs**
- The specific Cs are:
 - ਖ (U+0A16)
 - ਗ (U+0A17)
 - ਸ (U+0A38)
 - ਜ (U+0A1C)
 - ਫ (U+0A2B)
 - ਲ (U+0A32)
- **Valid:**
 - ਗਜ਼ਲ ਜਿੱਦ ਸ਼ੀ
- **Invalid:**
 - ਰਧ, ਖੀਜ਼ਲ

Whole Label Evaluation Rules (in plain English)

- **Rule 2: H must be preceded by C or CN and followed by specified Cs only**

- The specific Cs are:

- ਰ (U+0A30)
- ਵ (U+0A35)
- ਹ (U+0A39)

- **Valid:**

- ਸ੍ਰ ਗੜ੍ਹ ਸ਼੍ਰੀ
- ਸ਼੍ਰੀ = ਸ (U+0A36)+ ੍ਰ (U+0A3C)+ ੍ਰ (U+0A4D) + ਰ (U+0A30) + ੀ (U+0A40)

- **Invalid:**

- ੍ਰੀ ਤ੍ਰਖ

Whole Label Evaluation Rules (in plain English)

- ⦿ **Rule 3: M must be preceded by C or CN**
- ⦿ **Valid:**
 - ਜਿੱਦ ਸ਼ੀ ਸੁੱਕੀ
- ⦿ **Invalid:**
 - ਸੁੱਕੀ ਤੁਕ ਿਰੜ

Whole Label Evaluation Rules (in plain English)

- ⦿ **Rule 4: B must be preceded by specific V or M**
- ⦿ The specific Vs are:
 - Long Vowels
 - ਉ (U+0A09)
- ⦿ The specific Ms are:
 - Long Matras – { ੂ (U+0A42)}
- ⦿ **Valid:**
 - ਗੇਂਦ ਨਹੀਂ ਉਂਜ ਬੈਂਡ
- ⦿ **Invalid:**
 - ਰੰਗ ਇੰਗ

Whole Label Evaluation Rules (in plain English)

- ⦿ **Rule 5: D must be preceded by C, N or a specified set of V or M**
- ⦿ The specific Vs are:
 - ਅ (U+0A05), ਇ (U+0A0F)
- ⦿ The specific Ms are:
 - { ਿ(U+0A3F), ੁ(U+0A41), ੁ (U+0A42)}
- ⦿ **Valid:**
 - ਇੰਗ ਅੰਗ ਸੰਗ ਸੁੰਘ
- ⦿ **Invalid:**
 - ਉੰਗ ਰਾਂਤ ੰਰਲ

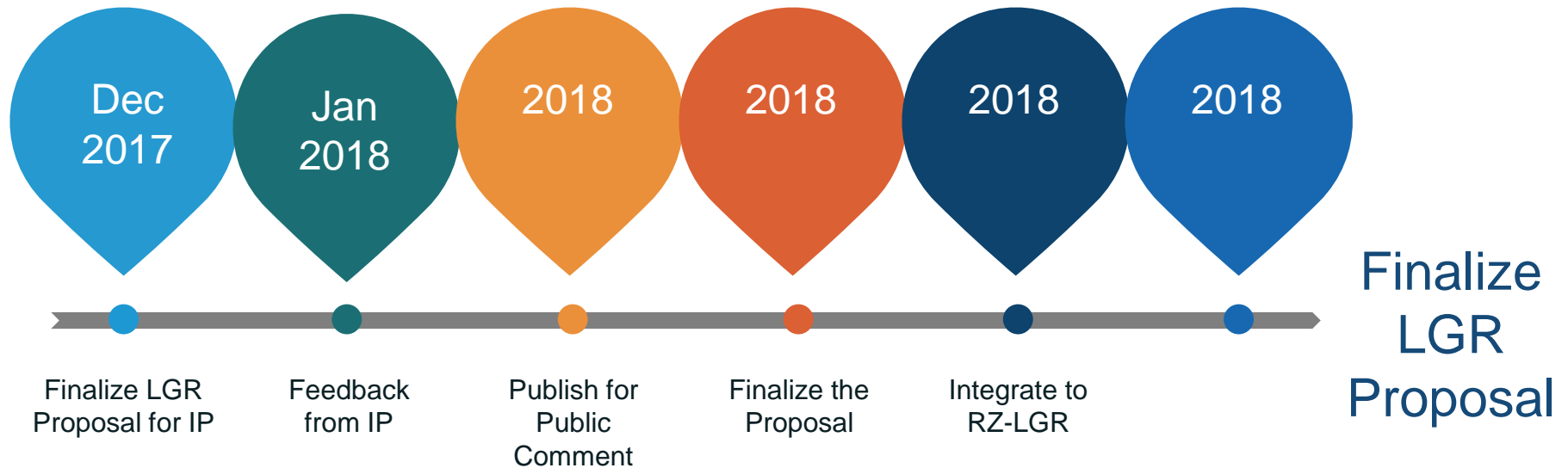
Whole Label Evaluation Rules (in plain English)

- **Rule 6: A must be preceded by C, N or specific V or M and followed by a C**
- The specific Vs are:
 - { ਅ (U+0A05), ਇ (U+0A0F), ਉ (U+0A09) } //Short vowels
 - ਐ (U+0A10)
- The specific Ms are:
 - { ਿ (U+0A3F), ੁ (U+0A41) } //Short matras
 - ੈ (U+0A48)
- **Valid:**
 - ਅੱਗ ਸ਼ੱਕ ਇੱਕ ਉੱਕਾ
- **Invalid:**
 - ੱੱਫ ਖੁੱਦ ਵੱੱਦ

Current Status

Section in Google Doc	Status (To be initiated / In Progress / Completed / Reviewed)	Additional Notes
Description of Script and use	Completed	
Languages using Script	Completed	
Classification of characters	Completed	
Repertoire Analysis	Completed	
Within-script Variants	In Progress	
Cross-script Variants	In Progress	Devanagari
WLE Rules	Completed	
References	Completed	

Timeline Till Completion of Work



To Summarize

The LGR proposal for Gurmukhi script is progressing as most of the components have been completed, particularly just the variants part is still being worked upon. Ideally, we are expecting a final proposal by end of December for feedback from the Integration Panel.

Thank You and Question

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