




Title: Proposal to includes Malayalam Numbers as distinct characters
Source: Centre for Linguistic Computing Keralam @ C-DIT
Action: For consideration by UTC and ISO/IEC JTC 1/SC 2/WG 2
Distribution: ISO/IEC JTC 1/SC 2, ISO/IEC JTC 1/SC 2
Contact: linguafranka@yahoo.com

1. Introduction

Unicode Malayalam range encodes Malayalam numerals. The numbers of TEN, HUNDRED and THOUSAND had not been included as separate characters even though Malayalam facilitates separate characters for those.

1.1. Characters Proposed in this Document

No	Shape of the character	Proposed Name	Proposed Character Position
1		MALAYALAM NUMBER TEN	U+0D70
2		MALAYALAM NUMBER HUNDRED	U+0D71
3		MALAYALAM NUMBER THOUSAND	U+0D72

1.2. About Centre for Linguistic Computing Keralam@ C-DIT

Centre for Linguistic Computing Keralam, known as CLiCK @ C-DIT is a joint venture of Kerala State IT Mission, Government of Kerala; Department of Linguistics, University of Kerala and Computational Linguistic Team @ C-DIT for the development research, facilitation and dissemination of Malayalam Language Computing in Keralam and the Malayalee speech communities around the world. www.clickeralam.org

1.3. Demographics

Malayalam is the language of the state of Kerala in India. Total population of Malayalam language speakers around the world is estimated to be around three cores (1999 Census)

2. Malayalam Numeric

With the representation of ten hundred, thousand by one, and zero Malayalam numeric system, possess separate symbols for the above

2.1. Malayalam number system

Ancient Malayalam number system did not include the digit zero. It had distinctive glyphs for numbers 10, 100, 1000. However, in modern practice, Malayalam numerals are used in the same way as decimal number, with a zero that looks similar to the digit zero in international form of Indian numerals but not as represented in the Unicode Malayalam character map

2.2. Compatibility between other Indian scripts

Malayalam numbers in the proposed form is available in all Indic script encoded in Unicode explicitly in most related language Tamil also, see Tamil Unicode chart

2.3 Usage of proposed Malayalam Numbers

Malayalam old numerals is not being widely used because it belongs to the minor extinct category of character, but the adapted Indian glyph form of zero is widely used with modern Arabic numerals. However, it necessary for the digitization of old Malayalam texts.(see cdac Link)

3. Published Usage Example

3.1 The existing Malayalam Numerals: The following document named കണക്കധികാരം (*kanakkadhikaaram*) is the mathematics text in Malayalam, which describes this.

Malayalam number thousand	Malayalam number hundred	Malayalam number ten	
ആയിരം നൂ = 1000	നൂറ് നൂ = 100	പത്തു പ = 10	ഒന്ന് ഒ = 1
രണ്ടു ര = 2	മൂന്നു മൂ = 3	നാലു നാ = 4	അഞ്ച് അ = 5
ആറു ആ = 6	ഏഴു ഏ = 7	എട്ടു എ = 8	ഒമ്പതു ഒമ്പ = 9
മൂന്നു മൂ = $\frac{3}{4}$	അര അ = $\frac{1}{2}$	കാലു കാ = $\frac{1}{4}$	അരകാലു അകാ = $\frac{1}{8}$
രണ്ടു മാ രമാ = $\frac{1}{10}$	മാ കാണി മാകാ = $\frac{1}{16}$	ഒരു മാ രുമാ = $\frac{1}{20}$	അര മാ രുമാ = $\frac{1}{40}$
കാണി കാ = $\frac{1}{80}$	അരകാണി അകാ = $\frac{1}{160}$	മൂന്നിരി മൂന്നി = $\frac{1}{320}$	കീഴ് കാലു കീ = $\frac{1}{320}$ ($\frac{1}{4}$)
മൂന്നു കാണി കാ = $\frac{3}{80}$	നാലു മാ നാമാ = $\frac{1}{5}$	മൂന്നു മാ നാമാ = $\frac{3}{20}$	അരകാണി മൂന്നിരി അകാ = $\frac{3}{320}$ $\frac{1}{160} + \frac{1}{320}$

4. References

Manavan Mapila () കണക്കധികാരം
 L.A Ramavarma (1971) പ്രാചീനകേരള ലിപികളു്: Kerla Sahithy Academy
 K.C Musaad (1980) പ്രാചീന ഗണിതം മലയാളത്തിൽ: State Institute of Language
 P.K Narayana Pillai (1951) *Pracheena malayaala grandhaa mathrakal*