

# ISO/IEC JTC 1/SC 2/WG 2 N3087

## PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646<sup>1</sup>

Please fill all the sections A, B and C below.

Please read Principles and Procedures Document (P & P) from <http://www.dkuug.dk/JTC1/SC2/WG2/docs/principles.html> for guidelines and details before filling this form.

Please ensure you are using the latest Form from <http://www.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html>.

See also <http://www.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html> for latest Roadmaps.

### A. Administrative

1. Title:	<i>Rumi Numeral System Symbols</i>
2. Requester's name:	<i>Azzeddine LAZREK</i>
3. Requester type (Member body/Liaison/Individual contribution):	<i>Member body</i>
	<i>Cadi Ayyad University Marrakech-Morocco</i>
4. Submission date:	<i>2006-03-30</i>
5. Requester's reference (if applicable):	<i>lazrek@ucam.ac.ma</i>
6. Choose one of the following:	
This is a complete proposal:	<i><a href="http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/amosl.pdf">http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/amosl.pdf</a></i>
(or) More information will be provided later:	

### B. Technical – General

1. Choose one of the following:	
a. This proposal is for a new script (set of characters):	
Proposed name of script:	
b. The proposal is for addition of character(s) to an existing block:	<i>addition of characters to existing blocks</i>
Name of the existing block:	
2. Number of characters in proposal:	<i>31</i>
3. Proposed category (select one from below - see section 2.2 of P&P document):	
A-Contemporary	<input type="checkbox"/>
B.1-Specialized (small collection)	<input checked="" type="checkbox"/>
B.2-Specialized (large collection)	<input type="checkbox"/>
C-Major extinct	<input type="checkbox"/>
D-Attested extinct	<input type="checkbox"/>
E-Minor extinct	<input type="checkbox"/>
F-Archaic Hieroglyphic or Ideographic	<input type="checkbox"/>
G-Obscure or questionable usage symbols	<input type="checkbox"/>
4. Proposed Level of Implementation (1, 2 or 3) (see Annex K in P&P document):	<i>1</i>
Is a rationale provided for the choice?	<i>Yes</i>
If Yes, reference:	
5. Is a repertoire including character names provided?	<i>Yes</i>
a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document?	<i>Yes</i>
b. Are the character shapes attached in a legible form suitable for review?	<i>Yes</i>
6. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard?	<i>True Type and LaTeX package</i>
If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used:	<i><a href="http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/rumi.ttf">http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/rumi.ttf</a> <a href="http://www.ucam.ac.ma/fssm/rydarab/system/zip/rumi.zip">http://www.ucam.ac.ma/fssm/rydarab/system/zip/rumi.zip</a></i>
7. References:	
a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided?	<i>Yes</i>
b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached?	<i>Yes</i>
8. Special encoding issues:	
Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)?	<i>Yes</i>

### 9. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at <http://www.unicode.org> for such information on other scripts. Also see <http://www.unicode.org/Public/UNIDATA/UCD.html> and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

<sup>1</sup> Form number: N3002-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10)



### C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before?	No
If YES explain	
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)?	Yes
If YES, with whom?	
If YES, available relevant documents: <a href="http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/rumibib.doc">http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/rumibib.doc</a>	
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included?	About 100 million of people
Reference: Arabic scripts	
4. The context of use for the proposed characters (type of use; common or rare)	rare
Reference:	
5. Are the proposed characters in current use by the user community?	No
If YES, where? Reference:	
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP?	No
If YES, is a rationale provided?	
If YES, reference:	
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)?	Yes
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence?	No
If YES, is a rationale for its inclusion provided?	
If YES, reference:	
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters?	No
If YES, is a rationale for its inclusion provided?	
If YES, reference:	
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character?	No
If YES, is a rationale for its inclusion provided?	
If YES, reference:	
11. Does the proposal include use of combining characters and/or use of composite sequences?	No
If YES, is a rationale for such use provided?	
If YES, reference:	
Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?	
If YES, reference:	
12. Does the proposal contain characters with any special properties such as control function or similar semantics?	No
If YES, describe in detail (include attachment if necessary)	
13. Does the proposal contain any Ideographic compatibility character(s)?	No
If YES, is the equivalent corresponding unified ideographic character(s) identified?	
If YES, reference:	

# Rumi Numeral System Symbols,

Additional characters proposed to Unicode

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## 1 Introduction

A special numeral system *rumi*<sup>1</sup> has been in use in North Africa since the X<sup>e</sup> century. It remained in use until the XVII<sup>e</sup> century. This system has been especially used in the administration of the city of Fez in Morocco. It has also been used in Al-Andalusians, Spain, starting from the XII<sup>e</sup> century. The forms of the digits are quite different from the Arabic<sup>2</sup> or the Arabic-Indic<sup>2</sup> digits in use today. The system of numeration was decimal, but not really positional. *rumi* use some special symbols (see Table 1, Table 2, Table 3 and Table 4). Some examples are available (see Table 5, Table 6 and Table 7). This system is also known as "zimam letters, Roman, Fez letters" (namely *Hrwf al-zmAm*, *al-rumi*, *Hrwf fAs* or also *rasm al-zmam*, *Qalam al-rumi*, *Qalam al-fAsy*).

## 2 Description

*rumi* numeral system has been described by many researchers and there is many studies about it. A detailed bibliography is presented in Figure 1 (see some figures from this bibliography in the end). We have adopted the one

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<sup>1</sup>using Transtec Transliteration

<http://www.ucam.ac.ma/fssm/rydarab/doc/communic/transtec.pdf>



<sup>2</sup>the identifier name used by The Unicode Consortium <http://www.unicode.org>

described by the mathematician Ibn Al-Banna (1256-1321, Marrakech) in his famous book [1] "Abstract of using rumi in calculus" in Arabic (namely Al-YqtDAb mn al-Eml b-al-rwmI fl al-HsAb).

rumi use some special symbols for digits:

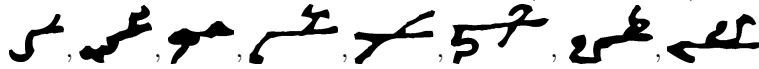
- rumi ones are (see Table 1): 
- rumi tens are (see Table 2): 
- rumi hundreds are (see Table 3): 

Multiples of thousand are represented by adding a slash under the based number:

- rumi thousands are noted by one bar under the number (see Table 5) (ex.,  for three thousands);
- rumi million are noted by two bars under the number (see Table 6) (ex.,  for three million);
- and so on.

Fraction is represented by adding a slash symbol separating the numerator from the denominator:

- rumi fractions are generally noted by (see Table 7):



- Some special fractions are also noted by (see Table 4): 

### 3 proposition

These symbols are proposed to be included in Unicode Standard. There names are desriped in rumi ones digits (see Table 8), rumi tens digits (see Table 9) rumi handreds digits (see Table 10) and rumi specila fractions (see Table 11).

As many manuscripts in studying use these symbols, we need to encode them. We are working on studying and translating to english the Ibn Al-Banna manuscript Al-YqtDAb mn al-Eml b-al-rwmI fl al-HsAb. A computer

system for transforming numbers from and to rumi numeral system is also in development.

The **rumi** and **AntiSym** fonts available, includes all these characters. In **rumi** font, used here, the shapes of the reference glyphs are scanned from [1]. It's in OpenType format [3] and converted in METAFONT as a  $\text{\LaTeX}$  package [4]. In **AntiSym** font, glyphs are drawing by hand in METAFONT as a  $\text{\LaTeX}$  package [2].

The shapes of the reference glyphs used are not frozen. They are continually being improved in *Multilingual scientific e-document processing* Project at Al-khawarizmi Atelier.

Some boxes are add to some symbols in Figures in order to emphases them and understand the purpose of the samples.

More information about this presentation is available in [5].

## References

- [1] Ibn Al-Banna (1256-1321, Marrakech), *Abstract of using rumi in calculus*, in Arabic.
- [2] Arabic mathematical old symbols package antisym for  $\text{\LaTeX}$ , <http://www.ucam.ac.ma/fssm/rydarab/system/zip/antisym.zip>.
- [3] rumi numeral system font in OpenType, <http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/rumi.ttf>.
- [4] rumi numeral system as a package for  $\text{\LaTeX}$ , <http://www.ucam.ac.ma/fssm/rydarab/system/zip/rumi.zip>.
- [5] Azzeddine Lazrek, *Arabic mathematical symbols for Unicode*, <http://www.ucam.ac.ma/fssm/rydarab/english/unicode.htm>.










1	2	3	4	5	6	7	8	9
								

Table 1: rumi ones symbols










10	20	30	40	50	60	70	80	90
								

Table 2: rumi tens symbols










100	200	300	400	500	600	700	800	900
								

Table 3: rumi hundreds symbols





1/2	1/4	1/3	2/3
			

Table 4: rumi special fractions symbols




























1000	2000	3000	4000	5000	6000	7000	8000	9000
								
10000	20000	30000	40000	50000	60000	70000	80000	90000
								
100000	200000	300000	400000	500000	600000	700000	800000	900000
								

Table 5: rumi thousands examples

1000000	2000000	3000000	4000000	5000000	6000000	7000000	8000000	9000000
10000000	20000000	30000000	40000000	50000000	60000000	70000000	80000000	90000000
100000000	200000000	300000000	400000000	500000000	600000000	700000000	800000000	900000000

Table 6: rumi millions examples

1/2	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10

Table 7: rumi fractions examples

	RUMI DIGIT ONE ≈ 0031 1 digit one ≈ 0661 ١ Arabic-Indic digit one
	RUMI DIGIT TWO ≈ 0032 2 digit two ≈ 0662 ٢ Arabic-Indic digit two
	RUMI DIGIT THREE ≈ 0033 3 digit three ≈ 0663 ٣ Arabic-Indic digit three
	RUMI DIGIT four ≈ 0034 4 digit four ≈ 0664 ٤ Arabic-Indic digit four
	RUMI DIGIT FIVE ≈ 0035 5 digit five ≈ 0665 ٥ Arabic-Indic digit five
	RUMI DIGIT SIX ≈ 0036 6 digit six ≈ 0666 ٦ Arabic-Indic digit six
	RUMI DIGIT SEVEN ≈ 0037 7 digit seven ≈ 0667 ٧ Arabic-Indic digit seven
	RUMI DIGIT EIGHT ≈ 0038 8 digit eight ≈ 0668 ٨ Arabic-Indic digit eight
	RUMI DIGIT NINE ≈ 0039 9 digit nine ≈ 0669 ٩ Arabic-Indic digit nine

Table 8: RUMI ones digits



١٠	RUMI DIGIT TEN	• used as a symbol with a numeric value of 10
٢٠	RUMI DIGIT TWENTY	• used as a symbol with a numeric value of 20
٣٠	RUMI DIGIT THIRTY	• used as a symbol with a numeric value of 30
٤٠	RUMI DIGIT FORTY	• used as a symbol with a numeric value of 40
٥٠	RUMI DIGIT FIFTY	• used as a symbol with a numeric value of 50
٦٠	RUMI DIGIT SIXTY	• used as a symbol with a numeric value of 60
٧٠	RUMI DIGIT SEVENTY	• used as a symbol with a numeric value of 70
٨٠	RUMI DIGIT EIGHTY	• used as a symbol with a numeric value of 80
٩٠	RUMI DIGIT NINETY	• used as a symbol with a numeric value of 90
١٠٠	RUMI DIGIT HUNDRED	• used as a symbol with a numeric value of 100

Table 9: RUMI tens digits

٢٠٠	RUMI DIGIT TWO HUNDRED	• used as a symbol with a numeric value of 200
٣٠٠	RUMI DIGIT TREE HUNDRED	• used as a symbol with a numeric value of 300
٤٠٠	RUMI DIGIT FOUR HUNDRED	• used as a symbol with a numeric value of 400
٥٠٠	RUMI DIGIT FIVE HUNDRED	• used as a symbol with a numeric value of 500
٦٠٠	RUMI DIGIT SIX HUNDRED	• used as a symbol with a numeric value of 600
٧٠٠	RUMI DIGIT SEVEN HUNDRED	• used as a symbol with a numeric value of 700
٨٠٠	RUMI DIGIT EIGHT HUNDRED	• used as a symbol with a numeric value of 800
٩٠٠	RUMI DIGIT NINE HUNDRED	• used as a symbol with a numeric value of 900

Table 10: RUMI hundreds digits



#### RUMI FRACTION ONE HALF

- used as an other symbol with a numeric value of  $1/2$   
 $\approx$  00BD  $1/2$  vulgar fraction one half



#### RUMI FRACTION ONE QUARTER

- used as a symbol with a numeric value of  $1/4$   
 $\approx$  00BC  $1/4$  vulgar fraction one quarter



#### RUMI FRACTION ONE THIRD

- used as a symbol with a numeric value of  $1/3$   
 $\approx$  2153  $1/3$  vulgar fraction one third



#### RUMI FRACTION TWO THIRDS

- used as an other symbol with a numeric value of  $2/3$   
 $\approx$  2154  $2/3$  vulgar fraction two thirds

Table 11: RUMI special fractions

- [2] ابن البنا المراكشي، انقصاب في العمل بالرومي، مخطوط بالخزانة الوطنية بالرباط تحت رقم ف 416 مجموعة ص 425-432
- [3] أحمد ابن الصباغي مكي، إرشاد المتعلم والناسي في صفة أشكال القلم الناسي، طبعة فاس، 1316هـ (المكتبة الوطنية 17000989)
- [4] قاسم بن أحمد السامرائي، الأرقام في المشرق عربة التجار وفي الغرب الأوربي سنسكريتية هندية الدثار، عالم الكتب، المجلد التاسع عشر، العدد الخامس والسادس مزدوجين عن الرقم العربي، 1998.
- [10] S. Bartina, *Cifras coptas y cultura árabe*, Studia Papyrologica 7 (1968), 199-210.
- [11] Georges S. Colin, *De l'origine grecque des "chiffres de Fès" et de nos "chiffres arabes"*, Journal Asiatique 222 (1933), 193-215.  
<http://laportj.club.fr/maghreb/Journalasiatique.doc>  
<http://phrontistery.info/nnsbib.html>
- [12] Rosa Comes, *Arabic, Rûmî, Coptic, or merely Greek Alphanumerical Notation? The case of a Mozarabic 10th Century Andalusî Manuscript*. Suhayl 3 (2002-2003), 157-185.  
[http://chama.fltr.ucl.ac.be/chama2/newsletter\\_3.htm](http://chama.fltr.ucl.ac.be/chama2/newsletter_3.htm)  
<http://www.ub.es/arab/librevs/index3.htm>
- [13] A. González Palencia, *Los mozárabes de Toledo en los siglos XII y XIII*. 4 vols., Madrid, 1926-1930.  
<http://www.filosofia.org/ave/001/a042.htm>  
<http://www.architoleado.org/catedral/archivos/textoarchivo.htm>
- [14] Youcef Guergour, *Les différents systèmes de numérotation au Maghreb à l'époque ottomane: l'exemple des chiffres rûmî*. E. Ihsanoglu, A. Djebbar et F. Günergun, eds. Burlington, Science, Technology and Industry in the Ottoman World. Proceedings of the XXth International Congress of History of Science, Liège, 20-26 July 1997, Vol. VI. Brepols. Turnhout, 2000, 67-74.  
[http://www.math.buffalo.edu/mad/AMU/amu\\_chma\\_23a.html](http://www.math.buffalo.edu/mad/AMU/amu_chma_23a.html)  
<http://phrontistery.info/nnsbib.html>  
[www.math.buffalo.edu/mad/AMU/amuchmapdf/amuchma23.pdf](http://www.math.buffalo.edu/mad/AMU/amuchmapdf/amuchma23.pdf)
- [15] Ana Labarta y Carmen Barceló, *Números y cifras en los documentos árabe-hispanos*. Córdoba, 1988.  
<http://www.islamyal-andalus.org/control/noticia.php?id=477>  
<http://museoedeamerica.mcu.es/pdf/anales13/capitulo14.pdf>  
<http://www.porticolibrenas.es/c/PS627ARA.pdf>  
[http://www.porticolibrenas.es/dept\\_estudios\\_arabes\\_valencia.htm](http://www.porticolibrenas.es/dept_estudios_arabes_valencia.htm)
- [16] G. Levi della Vida, *Appunti e quesiti di storia letteraria araba: Numerali greci in documenti arabo-spagnoli*, Rivista degli studi orientali 14 (1933), 249-283.  
<http://web.uni-frankfurt.de/fb13/igaw/publication/mathematic.html>  
<http://cura.free.fr/quinq/04bezza.html>  
<http://web.uni-bamberg.de/unibib/melcom/Sagaria%20Rossi-1.html>
- [17] J.A. Sánchez Pérez, *Sobre las cifras rûmîes*, Al-Andalus 3 (1935), 97-125.  
<http://www.islamyal-andalus.org/control/noticia.php?id=477>
- [18] Abel REY, *A propos de l'origine grecque des "chiffres de Fès" et de nos "chiffres arabes"*, Revue des Etudes Grecques. Tome 48, 1935, pp. 525-538.
- [19] Driss Lamrabet, *Aperçu sur les systèmes de numération en usage au Maghreb au XVIIe siècle*, Publications de la Faculté des Lettres et des Sciences Humaines, Rabat ; Si Colloques et Séminaires n° 104, 2003, pp. 23-37.
- [20] Adam Gacek, *The Arabic Manuscript Tradition: A Glossary of Technical Terms and Bibliography*, Brill Academic Pub Published, 2001  
<https://bookweb.kinokuniya.co.jp/guest/cgi-bin/booksea.cgi?ISBN=9004120610>

Handwritten text in a script, likely a form or ledger, with multiple lines of entries. The text is written in a cursive style, possibly a form of Urdu or Persian script, and is organized into columns and rows, suggesting a structured record-keeping system.

وشكل التفرار خضرة تحت العدة وهذه صورة ذلك كله  
 وكذا الألف الألام وعشراتها ومثلها ترجع إلى شئ  
 التي قبلها والبر وفيه التفرار لكل نوع ما ياتي له منه  
 كذلك إلى غير نهاية وأما شئ الكسور فمثل العدة  
 الذي يشتمل منه الكسر ويخط بوجه خط يسمى خط  
 ويكتب بوجه عود الآخر التي تشتمل منه وكذا كسور  
 الكسور وهي أمثلة منها شئ يقسم على شئ وتسمى  
 الشئ الذي يقسمه بالاسم والاسم هو

9



In the name of The God, the most Merciful, the most Compassionate  
The God prayed on Mohammed reigned and on his family and accompanied him  
and peace of delivery

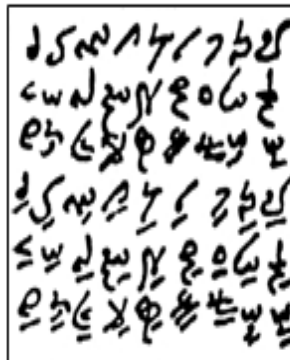
The shortening from the work in the Rwny in the calculation, formation of the participant virtuous of the magnificent jurist generous associated complete Abou AIEbas Ahmed Ben Mohammed Ben Othman al'azdy. He was introduced as mason's son numerical Alhruakshy. The God sanctified went him and his uterus in his blessing and his casual dress and lengthens him.

The God praised neither his break-off for acne nor his end for border and the prayer on Mohammed is discerning and worshipped him and on his family and his peace and honor a lot. After, so this shortening from the work in the Rwny in the account on towards what choice of the heads from the laborers fell, and from The God asks the good success.

Chapter in names ranks of the numbers and prescription glyphs in Rwny.












Knows that the rank first is the ones nine and the second is the tens nine and the third is the hundreds nine and the fourth is the thousands nine and the fifth is the tens of thousands nine and the sixth is the hundreds of thousands nine and the seventh is the thousands thousands nine and so on until the infinite one.



For each number of the first three numbers ranks a sign witch distinguishes it, the first is one and the last is nine hundred. The draws of thousands and its tens and its hundreds are the same as the draws of ones and tens and hundreds and the difference between them is the repetition. The form of the repetition is a bar under the number and these images for all them:




Likewise thousands of thousands and its tens and its hundreds return to glyphs before them and the difference between them the repetition. For each kind what be necessary for him likewise so on until the infinite one.

When the fractions are to be drawn, we write the base number which derives the fraction and draws above him a line called chair and writes above him the parts which

derives from him, and as the fraction's fraction. Here are examples of draw: one half , two thirds , tree quarters , four fifths , five sixths , six sevenths , seven eighths , eight ninths , nine tenths . And leads the man working in make up provided that draw the one half in this way , and one quarter in this way 

and one third in this way  and the two third in this way . They don't use fractions which there based are more than ten. If they arrive to have some of them they transform them to what you will know in the addition chapter after this one.

The fractions they used stubborn two kinds added and different. So for added fraction, the fraction whose based is great advances and the little about right and little low from him,

example five eighth and three eighth and third eighth in this way . As for different fraction, parts are under others parts example five eighths and six sevenths in this way

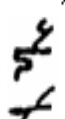


Figure 4: rumi numeral system in [1] page 1 translated in english

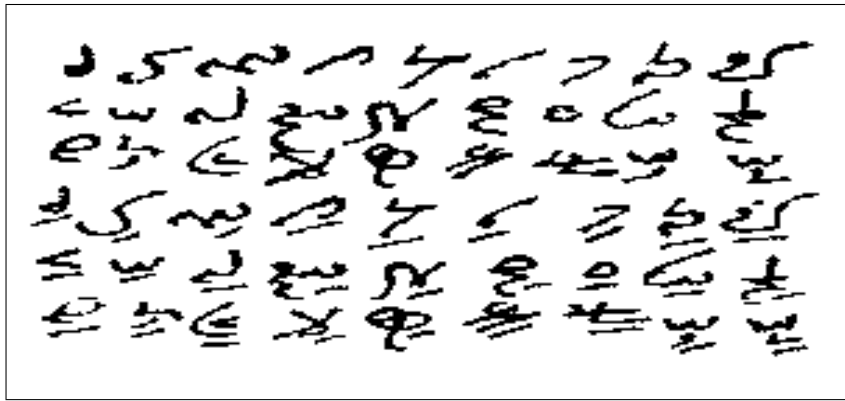


Figure 5: Integer rumi symbols in [1]



Figure 6: Fraction rumi symbols in [1]

١	٢	٣	٤	٥	٦	٧	٨	٩	١٠
١١	١٢	١٣	١٤	١٥	١٦	١٧	١٨	١٩	٢٠
٢١	٢٢	٢٣	٢٤	٢٥	٢٦	٢٧	٢٨	٢٩	٣٠
٣١	٣٢	٣٣	٣٤	٣٥	٣٦	٣٧	٣٨	٣٩	٤٠
٤١	٤٢	٤٣	٤٤	٤٥	٤٦	٤٧	٤٨	٤٩	٥٠
٥١	٥٢	٥٣	٥٤	٥٥	٥٦	٥٧	٥٨	٥٩	٦٠
٦١	٦٢	٦٣	٦٤	٦٥	٦٦	٦٧	٦٨	٦٩	٧٠
٧١	٧٢	٧٣	٧٤	٧٥	٧٦	٧٧	٧٨	٧٩	٨٠
٨١	٨٢	٨٣	٨٤	٨٥	٨٦	٨٧	٨٨	٨٩	٩٠
٩١	٩٢	٩٣	٩٤	٩٥	٩٦	٩٧	٩٨	٩٩	١٠٠

Figure 7: Examples in [3]

الحجوة هذه نهايته ما اتصل عليه كتاب (المراد من المصنف)

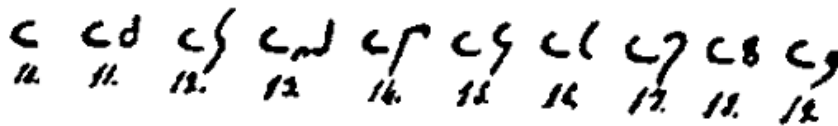
باب ١	في أصل الشعر	باب ١	في أصل الشعر
باب ٢	في رتبة الشعر ووزنه	باب ٢	في رتبة الشعر ووزنه
باب ٣	في مال الشعر وكيفية	باب ٣	في مال الشعر وكيفية
باب ٤	في غير الشعر	باب ٤	في غير الشعر
باب ٥	في الشعر في الفبا	باب ٥	في الشعر في الفبا
باب ٦	في المشاكيم من الشعر	باب ٦	في المشاكيم من الشعر
باب ٧	في رغب وشرع في الشعر	باب ٧	في رغب وشرع في الشعر
باب ٨	في حيل الشعر ونيتة	باب ٨	في حيل الشعر ونيتة
باب ٩	في اللجوع والمضوع	باب ٩	في اللجوع والمضوع
باب ١٠	في الفعل	باب ١٠	في الفعل
باب ١١	في الترخ وارتجيد	باب ١١	في الترخ وارتجيد
باب ١٢	في البعوتة والجمال	باب ١٢	في البعوتة والجمال
باب ١٣	في عمل الشعر	باب ١٣	في عمل الشعر
باب ١٤	في المعنوا والمخرج والنهاية	باب ١٤	في المعنوا والمخرج والنهاية
باب ١٥	في راجح	باب ١٥	في راجح
باب ١٦	في التفسير	باب ١٦	في التفسير
باب ١٧	في الجاز	باب ١٧	في الجاز
باب ١٨	في التثيل	باب ١٨	في التثيل
باب ١٩	في التثنية	باب ١٩	في التثنية
باب ٢٠	في التثني	باب ٢٠	في التثني
باب ٢١	في التثني	باب ٢١	في التثني
باب ٢٢	في التثني	باب ٢٢	في التثني
باب ٢٣	في التثني	باب ٢٣	في التثني
باب ٢٤	في التثني	باب ٢٤	في التثني
باب ٢٥	في التثني	باب ٢٥	في التثني
باب ٢٦	في التثني	باب ٢٦	في التثني
باب ٢٧	في التثني	باب ٢٧	في التثني
باب ٢٨	في التثني	باب ٢٨	في التثني
باب ٢٩	في التثني	باب ٢٩	في التثني
باب ٣٠	في التثني	باب ٣٠	في التثني

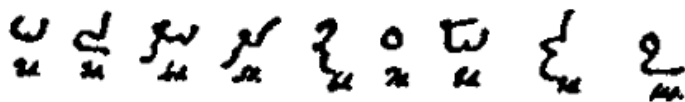
Figure 8: Examples from [4]

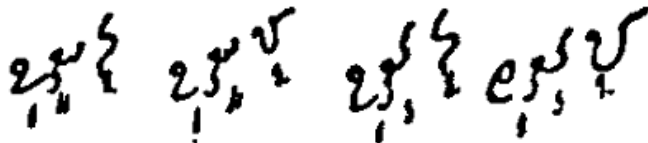


parum dirutus, necesse fuit abscidere folia quæ inutilia evaserant; hæc suspitio confirmatur ex facto, quod folia octogesimo posteriora morsus vermium majores habent præcipue circa folium centesimum tertium; et notandum est hos morsus jam in codice existentes esse cum collatio, saltem secunda fiebat, nam quidam restaurati fuere, ut videtur ab antiquo et verba a vermibus plene corrosa in margine explicantur: charta antiquioris codicis major erat, nam a folio trigesimo nono usque ad centesimum quintum vestigia antiquioris foliorum numerationis existunt, nam numeratio ex magna parte abscisa fuit: in foliis secundæ partis nihil hujusmodi numerationis distinguitur, et breves notæ marginales, præcipue verbum بلغت pluries in margine primæ partis scriptum fere evanuit.

SPECIMEN NUMERATIONIS FOLIORUM IN CODICE ESCURIALENSI.


  
 10. 11. 12. 13. 14. 15. 16. 17. 18. 19.


  
 20. 21. 22. 23. 24. 25. 26. 27. 28. 29.


  
 30. 31. 32. 33.

*Foliorum numeratio.* Codex habet foliorum numerationem modernam, factam postquam codex a librario numerationis arabicæ imperito compactus est; a folio enim secundo transilire necesse fuit ad folium decimum septimum et a folio vigesimo secundo iterum ad tertium recedere.

Ex foliorum numeratione antiqua codex centum sexaginta

Figure 9: Examples from [4]

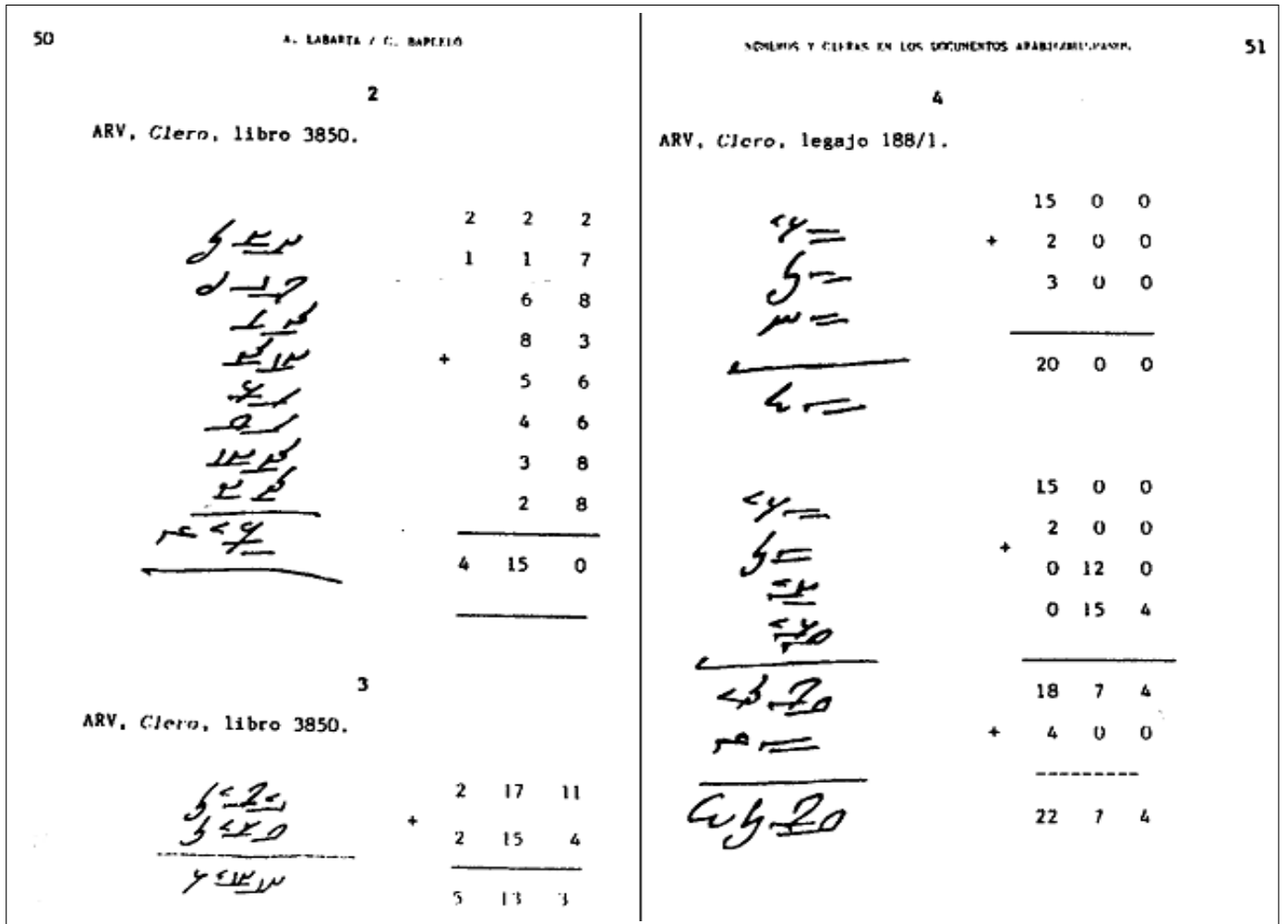


Figure 10: Examples in [15] pages 50-51 from [4]

ARV, Clero, libro 3850.

940	7	5	4
311	3	16	11
411	3	8	5
53	53	19	0
43	43	14	4
97	97	13	4
6	6	18	0
5	5	3	10
1	1	14	2

Seco de Lucena (1961) documento nº 12 (facsimil).

وَلَدَ عَمْرُو بْنُ  
مَرْثَدَةَ بْنِ  
مَرْثَدَةَ بْنِ  
مَرْثَدَةَ بْنِ

Base (asl) :	26	2	4
Vendedor (hā'i) :	3	2	
Impuesto (wāyiba) :	29	5	-

Nota: El resultado de la suma se ha redondeado por exceso.

Figure 11: Examples in [15] pages 52-53 from [4]