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Proposals from the Script Encoding Initiative

Title

Rumi Numeral System Symbols: Additional characters proposed to Unicode

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Peer reviewed

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

PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646¹

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: *Rumi Numeral System Symbols*

2. Requester's name: *Azzeddine LAZREK*

3. Requester type (Member body/Liaison/Individual contribution): *Member body*
Cadi Ayyad University Marrakech-Morocco

4. Submission date: *2006-03-30*

5. Requester's reference (if applicable): *lazrek@ucam.ac.ma*

6. Choose one of the following:
This is a complete proposal: <http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/amosl.pdf>
(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: *addition of characters to existing blocks*
Name of the existing block: _____

2. Number of characters in proposal: *31*

3. Proposed category (select one from below - see section 2.2 of P&P document):
A-Contemporary B.1-Specialized (small collection) B.2-Specialized (large collection)
C-Major extinct D-Attested extinct E-Minor extinct
F-Archaic Hieroglyphic or Ideographic G-Obscure or questionable usage symbols

4. Proposed Level of Implementation (1, 2 or 3) (see Annex K in P&P document): *1*
Is a rationale provided for the choice? *Yes*
If Yes, reference: _____

5. Is a repertoire including character names provided? *Yes*
a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document? *Yes*
b. Are the character shapes attached in a legible form suitable for review? *Yes*

6. Who will provide the appropriate computerized font (ordered preference: True Type, or PostScript format) for publishing the standard? *True Type and LaTeX package*
If available now, identify source(s) for the font (include address, e-mail, ftp-site, etc.) and indicate the tools used: <http://www.ucam.ac.ma/fssm/rydarab/doc/unicode/rumi.ttf>
<http://www.ucam.ac.ma/fssm/rydarab/system/zip/rumi.zip>

7. References:
a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *Yes*
b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? *Yes*

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)? *Yes*

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.

¹ 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? If YES explain	No
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.)? If YES, with whom? If YES, available relevant documents:	Yes
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? Reference:	About 100 million of people Arabic scripts
4. The context of use for the proposed characters (type of use; common or rare) Reference:	rare
5. Are the proposed characters in current use by the user community? If YES, where? Reference:	No
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? If YES, is a rationale provided? If YES, reference:	No
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? If YES, is a rationale for its inclusion provided? If YES, reference:	No
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? If YES, is a rationale for its inclusion provided? If YES, reference:	No
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to an existing character? If YES, is a rationale for its inclusion provided? If YES, reference:	No
11. Does the proposal include use of combining characters and/or use of composite sequences? 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:	No
12. Does the proposal contain characters with any special properties such as control function or similar semantics? If YES, describe in detail (include attachment if necessary)	No
13. Does the proposal contain any Ideographic compatibility character(s)? If YES, is the equivalent corresponding unified ideographic character(s) identified? If YES, reference:	No

Rumi Numeral System Symbols,

Additional characters proposed to Unicode

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March 30, 2006

1 Introduction

A special numeral system *rumi*¹ has been in use in North Africa since the X^e century. It remained in use until the XVII^e 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^e century. The forms of the digits are quite different from the Arabic² or the Arabic-Indic² 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

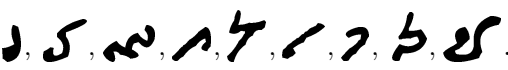


¹using Transtec Transliteration

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



²the 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).


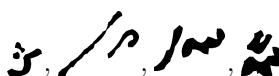
rumi use some special symbols for digits:

- 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 descriped 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 \LaTeX package [4]. In **AntiSym** font, glyphs are drawing by hand in METAFONT as a \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 \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 \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
<u>د</u>	<u>ك</u>	<u>س</u>	<u>ر</u>	<u>٤</u>	<u>٦</u>	<u>٧</u>	<u>٨</u>	<u>٩</u>
10000000	20000000	30000000	40000000	50000000	60000000	70000000	80000000	90000000
<u>٤</u>	<u>٥</u>	<u>٦</u>	<u>٧</u>	<u>٨</u>	<u>٩</u>	<u>٠</u>	<u>١</u>	<u>٢</u>
100000000	200000000	300000000	400000000	500000000	600000000	700000000	800000000	900000000
<u>٣</u>	<u>٤</u>	<u>٥</u>	<u>٦</u>	<u>٧</u>	<u>٨</u>	<u>٩</u>	<u>٠</u>	<u>١</u>

Table 6: rumi millions examples

1/2	2/3	3/4	4/5	5/6	6/7	7/8	8/9	9/10
<u>١</u> / <u>٢</u>	<u>٢</u> / <u>٣</u>	<u>٣</u> / <u>٤</u>	<u>٤</u> / <u>٥</u>	<u>٥</u> / <u>٦</u>	<u>٦</u> / <u>٧</u>	<u>٧</u> / <u>٨</u>	<u>٨</u> / <u>٩</u>	<u>٩</u> / <u>١٠</u>

Table 7: rumi fractions examples

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

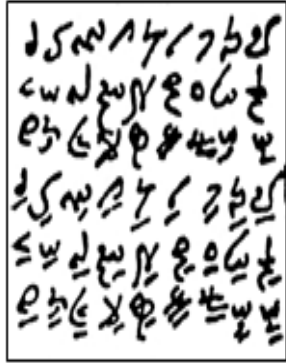
- [2] ابن البنا المراكشي، القضاء في العمل بالرومي، مخطوط بالخزانة الوطنية بالرباط تحت رقم ق 416 مجموعة ص 425-432
- [3] احمد ابن الصياهي سكرج، إرشاد المتعلم والناسي في صفة أشكال القلم الناسي، طبعة فاس، 1316هـ (المكتبة الوطنية 17000989)
- [4] قاسم بن أحمد السامرائي، الأرقام في المشرق عربة التجار وفي الغرب الأوربي سنسكريتية هندية الدثار، عالم الكتب، المجلد التاسع عشر، العدد الخامس والسادس مزدوجين عن الرقم العربي، 1998.
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<http://www.porticolibrenias.es/c/PS627ARA.pdf>
http://www.porticolibrenias.es/dept_estudios_arabes_valencia.htm
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<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 du XVIIe siècle*, Publications de la Faculté des Lettres et des Sciences Humaines, Rabat ; Si Colloques et Séminaires n° 104, 2003, pp. 23-37.
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<https://bookweb.kinokuniya.co.jp/guest/cgi-bin/booksea.cgi?ISBN=9004120610>

بسم الله الرحمن الرحيم
صلى الله على سيدنا محمد وعلى آله وصحبه وسلم تسليماً





لاقتضاب من العمل بالرومي في الحساب، تأليف الشيخ الفقيه الجليل الفاضل المشارك الأكمل المرحوم أبي العباس أحمد بن محمد بن عثمان الأزدي، عرف بابن البناء التدي المراكشي، قدس الله روحه ورحمه بته وفضلته وطوله¹.






الحمد لله هذا لا انتطاع² لعدة³ ولا هاية لحدده والصلاة على محمد نبيه وعبدته وعلى آله وسلم وشرفه كثيراً⁴. وبعد، فهذا اقتضاب من العمل بالرومي في الحساب على نحو ما وقع⁵ اختيار الرؤساء⁶ من العمال، وعن الله أسأل حسن التوفيق. باب في أسماء مراتب الأعداد وصفة الرشم بالرومي.






اعلم أن المرتبة الأولى هي الأحاد التسعة والثانية هي العشرات التسع والثالثة هي المئون التسع والرابعة هي الآلاف التسعة والخامسة هي عشرات الآلاف التسعة⁷ والسامسة هي مئوا الآلاف التسع والسابعة هي آلاف الآلاف التسعة⁸ وهكذا إلى غير هاية. ولكل عدد من أعداد المراتب الثلاث الأول رشم يخصه أولها واحد وآخرها تسع مائة ورشم الآلاف وعشراتها ومائتها كرشوم الأحاد وعشراتها ومائتها والفرق بينهما بال تكرار وشكل التكرار حفظه⁹ تحت العدد وهذه صورة ذلك كله:




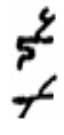
وكذلك آلاف الآلاف وعشراتها وهؤا ترجع إلى رشم التي قبلها والفرق بينهما التكرار. لكل نوع ما يجب له منه¹⁰ كذلك إلى غير هاية. وأما رشم الكسور فرشم العدد الذي يشتق منه الكسر¹¹ ويخط فوفه خط يسمى كرسيا ويكتب فوفه عدة الأجزاء التي تشتق منه وكذلك كسور الكسور وهي

أمثلة منها رشم نصف  وثلاثين  وثلاثة أرباع  وأربعة أخماس  وخمسة

أسدس  وستة أسباع  وسبعة أثمان  وثمانية أتساع  وتسعة أعشار  وقد اصطلح أصحاب العمل على أن يرشوا

النصف هكذا  والرابع هكذا  والثالث هكذا  والثلاثين هكذا  وهكذا  ولا يستعملون الأجزاء التي مقامها أكثر من عشرة.

وان وقع لهم شيء منها في العمل صرفوه على ما ستعرفه في باب الجمع بعد هنا. والكسور المستعملة عندهم نوعان مضافة ومختلفة فمما المضافة فيتقدم الكسر الذي مقامه أعظم ويكون الأقل عن يمينه منخففاً منه قليلاً مثل خمسة أثمان وثلاثة أثمان ثمن وثلاث ثمن ثمن رشمها¹² هكذا  وأما



لمختلفة فيعضها تحت بعض مثل خمسة أثمان وستة أسباع رشمها هكذا

¹ ابن تيمية، في السخنة الكتابية: تأليف الشيخ الأجل الأستاذ الفاضل العلامة الفقيه أبو العباس أحمد بن محمد بن عثمان الأزدي، رحمه الله ورضي عنه

² رومه كلمة "نواع" ويرحم كلمة "انتطاع" كما روم في السخنة القبا

³ في السخنة القباية: جده

⁴ في السخنة القباية: وللهلاد والسهلاد على سيدنا محمد بيا وبيده وعلى آله وشرفه كثيراً

⁵ في السخنة قباية: ربامد: مليا

⁶ رومه كلمة "أروما" ويرحم كلمة "أروسل" كما روم في السخنة قباية ويكتب على نحو "أروسل"

⁷ في السخنة قباية: الجمع

⁸ في السخنة قباية: نمنان: والسماجة في آلاف الآلاف الخمسة ويرحم خذها تهبود سة سبوح نند في البردوم

⁹ رومه كلمة "سختنا" ويرحم كلمة "سختنا" كما روم في السخنة القباية

Figure 3: rumi numeral system in [1] page 1 printed

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

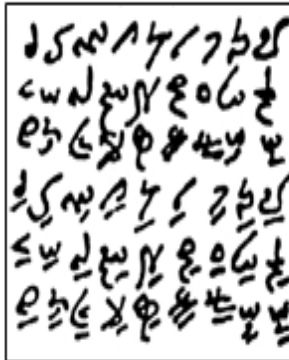
The shortening from the work in the Rwny in the calculation, formation of the participart virtuous of the magnificent jurist generous associated complete Abou AIEbas Ahmed Ben Mohammed Ben Othman al'azdy. He was introduced as mason's son numerical Alrwaakshy. The God sanctified went him and his uterus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

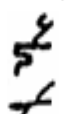


Figure 4: rumi numeral system in [1] page 1 translated in english

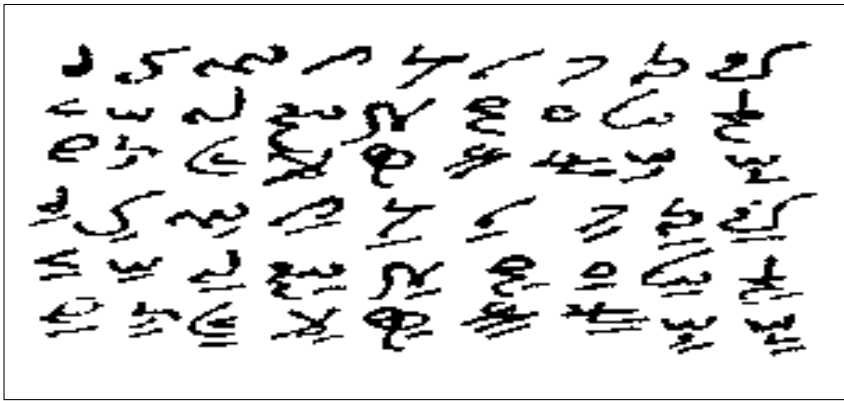


Figure 5: Integer rumi symbols in [1]

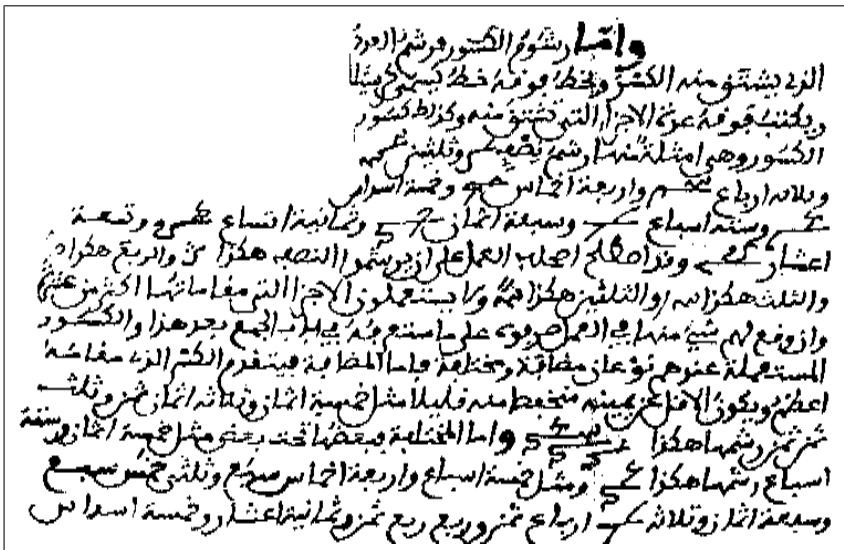


Figure 6: Fraction rumi symbols in [1]

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
١٠١	١٠٢	١٠٣	١٠٤	١٠٥	١٠٦	١٠٧	١٠٨	١٠٩	١١٠	١١١	١١٢	١١٣	١١٤	١١٥	١١٦	١١٧	١١٨	١١٩	١٢٠

Figure 7: Examples in [3]

المجتمعة هذه نهايته ما اتصل عليه كتاب (الجموع من المصنفين)

باب ٤	في اشعار الخلباء والنفط	باب ٤٠	في أصل الشعر
باب ٥	في تفضي الشعر ومنه عليه	باب ٤١	من رتبة الشعر وزوجته
باب ٦	في جمع الشعر وتفضيله	باب ٤٢	في بيان الشعر وكيفية
باب ٧	في التكتيب بالشعر وكيفية	باب ٤٣	في غير الشعر
باب ٨	في الفراء والحذابين	باب ٤٤	في الشعر في الفبا
باب ٩	في الغليز من الشعر او الغليز	باب ٤٥	في المشاكيم من الشعر
باب ١٠	في الشعر في الشعر والشعر	باب ٤٦	في ترغيب الشعر او على الخلق
باب ١١	في اللبث والمغنى	باب ٤٧	في حير الشعر ونيتته
باب ١٢	في فيراوزان	باب ٤٨	في اللجوع والمضوع
باب ١٣	في التصريح وال	باب ٤٩	في افعال
باب ١٤	في اليفع والكموال	باب ٥٠	في الترحم والتعبيد
باب ١٥	في ادراك التاجير	باب ٥١	في البهوية والجمال
باب ١٦	في الغامع والظالم	باب ٥٢	في عمل الشعر
باب ١٧	في البلاغة	باب ٥٣	في المبتدأ والخروج والنهاية
باب ١٨	في البيان	باب ٥٤	في الجاز
باب ١٩	في المختص والبروح	باب ٥٥	في التفسير
باب ٢٠	في الاستعارة	باب ٥٦	في التخييل
باب ٢١	في التثنية	باب ٥٧	في التثنية
باب ٢٢	في الاستعارة	باب ٥٨	في التثنية
باب ٢٣	في التثنية	باب ٥٩	في التثنية
باب ٢٤	في التثنية	باب ٦٠	في التثنية
باب ٢٥	في التثنية	باب ٦١	في التثنية
باب ٢٦	في التثنية	باب ٦٢	في التثنية
باب ٢٧	في التثنية	باب ٦٣	في التثنية
باب ٢٨	في التثنية	باب ٦٤	في التثنية
باب ٢٩	في التثنية	باب ٦٥	في التثنية
باب ٣٠	في التثنية	باب ٦٦	في التثنية
باب ٣١	في التثنية	باب ٦٧	في التثنية
باب ٣٢	في التثنية	باب ٦٨	في التثنية
باب ٣٣	في التثنية	باب ٦٩	في التثنية
باب ٣٤	في التثنية	باب ٧٠	في التثنية
باب ٣٥	في التثنية	باب ٧١	في التثنية
باب ٣٦	في التثنية	باب ٧٢	في التثنية
باب ٣٧	في التثنية	باب ٧٣	في التثنية
باب ٣٨	في التثنية	باب ٧٤	في التثنية
باب ٣٩	في التثنية	باب ٧٥	في التثنية
باب ٤٠	في التثنية	باب ٧٦	في التثنية

Figure 8: Examples from [4]

2

ARV, Clero, libro 3850.

2	2	2	
1	1	7	
	6	8	
	8	3	
+	5	6	
	4	6	
	3	8	
	2	8	
	4	15	0

3

ARV, Clero, libro 3850.

2	17	11	
+	2	15	4
	5	13	3

4

ARV, Clero, legajo 188/1.

15	0	0	
+	2	0	0
	3	0	0
	20	0	0

15	0	0	
+	2	0	0
	0	12	0
	0	15	4
	18	7	4
+	4	0	0
	22	7	4

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

ARV, Clero, libro 3850.

٩٤٠	7 5 4

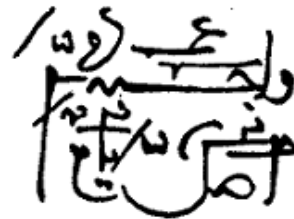
١٤٠٠	3 16 11
-----	-----
٤٠٠	3 8 5
-----	-----
٤٤٠٠	53 19 0

٥٠٠	43 14 4
-----	-----
١٤٠٠	97 13 4

١٠٠	6 18 0

٤٠٠	5 3 10
-----	-----
٥٠٠	1 14 2

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



Base (<u>asl</u>) :	26 2 4
Vendedor (<u>hā'i'</u>) :	3 2

Impuesto (<u>wāyiba</u>) :	29 5 -

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

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