

# The arabluatex package v1.8.5 – 2017/06/20

Robert Alessi  
[alessi@robertalessi.net](mailto:alessi@robertalessi.net)\*  
CNRS UMR 8167 Paris (France)

## Contents

<b>License and disclaimer</b>	<b>2</b>	4.8.2 The <i>abjad</i> . . . . .	24
<b>1 Introduction</b>	<b>3</b>	4.9 Additional characters . . . . .	25
1.1 arabluatex is for Lua <sup>®</sup> TeX . . . . .	4	4.10 Arabic emphasis . . . . .	25
<b>2 The basics of arabluatex</b>	<b>4</b>	<b>5 Arabic poetry</b>	<b>26</b>
2.1 Activating arabluatex . . . . .	4	5.1 Example . . . . .	29
2.2 Options . . . . .	5	<b>6 Special applications</b>	<b>30</b>
2.2.1 Classic contrasted with modern typesetting of Arabic	6	<b>7 Transliteration</b>	<b>30</b>
2.3 Typing Arabic . . . . .	7	7.1 Additional note on <code>dmg</code> convention .	32
2.3.1 Local options . . . . .	8	7.2 Examples . . . . .	33
<b>3 Standard Arab<sup>®</sup>TeX input</b>	<b>8</b>	<b>8 Buckwalter input scheme</b>	<b>34</b>
3.1 Consonants . . . . .	8	<b>9 Unicode Arabic input</b>	<b>37</b>
3.2 Additional characters . . . . .	9	<b>10 L<sup>®</sup>TeX Commands in Arabic environments</b>	<b>37</b>
3.3 Vowels . . . . .	10	10.1 Environments . . . . .	39
3.3.1 Long vowels . . . . .	10	10.1.1 Lists . . . . .	41
3.3.2 Short vowels . . . . .	11	10.2 csquotes . . . . .	42
<b>4 arabluatex in action</b>	<b>12</b>	10.3 reledmac . . . . .	43
4.1 The vowels and diphthongs . . . . .	12	10.4 quran . . . . .	43
4.2 Other orthographic signs . . . . .	13	<b>11 Future work</b>	<b>44</b>
4.3 Special orthographies . . . . .	18	<b>12 Implementation</b>	<b>44</b>
4.4 Quoting . . . . .	20	<b>References</b>	<b>53</b>
4.4.1 Quoting the <i>hamzah</i> . . . . .	21	<b>Change History</b>	<b>54</b>
4.5 The “pipe” character ( ) . . . . .	22	<b>Index</b>	<b>54</b>
4.6 Putting back on broken contextual analysis rules . . . . .	22		
4.7 Stretching characters: the <i>taṭwīl</i> .	24		
4.8 Digits . . . . .	24		
4.8.1 Numerical figures . . . . .	24		

\*Institutional email: [robert.alessi@cnrs.fr](mailto:robert.alessi@cnrs.fr)

## List of Tables

1	ArabTeX consonants . . . . .	9	5	“Quoted” <i>hamzah</i> . . . . .	21
2	ArabTeX additional characters . . .	10	6	Additional Arabic codings . . . . .	25
3	ArabTeX long vowels . . . . .	10	7	Buckwalter scheme . . . . .	35
4	ArabTeX short vowels . . . . .	11			

### Abstract

This package provides for Lua<sup>A</sup>TeX an ArabTeX-like interface to generate Arabic writing from an ASCII transliteration. It is particularly well-suited for complex documents such as technical documents or critical editions where a lot of left-to-right commands intertwine with Arabic writing. `arabluatex` is able to process any ArabTeX input notation. Its output can be set in the same modes of vocalization as ArabTeX, or in different roman transliterations. It further allows many typographical refinements. It will eventually interact with some other packages yet to come to produce from `.tex` source files, in addition to printed books, TEI `xml` compliant critical editions and/or lexicons that can be searched, analyzed and correlated in various ways.

## License and disclaimer

### License applicable to the software

`arabluatex` — Processing ArabTeX notation under Lua<sup>A</sup>TeX.

Copyright © 2016–2017 Robert Alessi

Please send error reports and suggestions for improvements to Robert Alessi:

- email: <[alessi@robertalessi.net](mailto:alessi@robertalessi.net)>
- website: <http://www.robertalessi.net/arabluatex>
- development: <http://git.robertalessi.net/arabluatex>
- comments, feature requests, bug reports: <https://notabug.org/ralessi/arabluatex/issues>

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program. If not, see <<http://www.gnu.org/licenses/>>.

This release of `arabluatex` consists of the following source files:

- `arabluatex.ins`
- `arabluatex.dtx`
- `arabluatex.lua`
- `arabluatex_voc.lua`
- `arabluatex_fullvoc.lua`
- `arabluatex_novoc.lua`


gpl3+

- `arabluatex_trans.lua`
- `arabluatex.el`

## License applicable to this document

Copyright © 2016–2017 Robert Alessi

CC BY-SA 4.0

 This document is licensed under the Creative Commons Attribution-ShareAlike 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-sa/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

## 1 Introduction

In comparison to Prof. Lagally’s outstanding ArabTeX,<sup>1</sup> ArabLuaTeX is at present nothing more than a modest piece of software. Hopefully—if I may say so—it will eventually provide all of its valuable qualities to the LuaL<sup>A</sup>TeX users.

`arabtex` dates back to 1992. As far as I know, it was then the first and only way to typeset Arabic texts with T<sub>E</sub>X and L<sup>A</sup>T<sub>E</sub>X. To achieve that, `arabtex` provided—and still does—an Arabic font in *Nashī* style and a macro package that defined its own input notation which was, as the author stated, “both machine, and human, readable, and suited for electronic transmission and e-mail communication”.<sup>2</sup> Even if the same can be said about Unicode, ArabTeX ASCII input notation still surpasses Unicode input, in my opinion, when it comes to typesetting complex documents, such as scientific documents or critical editions where footnotes and other kind of annotations can be particularly abundant. It must also be said that most text editors have trouble in displaying Arabic script connected with preceding or following L<sup>A</sup>T<sub>E</sub>X commands: it often happens that commands seem misplaced, not to mention punctuation marks, or opening or closing braces, brackets or parentheses that are unexpectedly displayed in the wrong direction. Of course, some text editors provide ways to get around such difficulties by inserting invisible Unicode characters, such as LEFT-TO-RIGHT or RIGHT-TO-LEFT MARKS (U+200E, U+200F), RTL/LTR “embed” characters (U+202B, U+202A) and RLO/LRO “bidi-override” characters (U+202E, U+202D).<sup>3</sup> Nonetheless, it remains that inserting all the time these invisible characters in complex documents rapidly becomes confusing and cumbersome.

The great advantage of ArabTeX notation is that it is immune from all these difficulties, let alone its being clear and straightforward. One also must remember that computers are designed to process code. ArabTeX notation is a way of encoding Arabic language, just as T<sub>E</sub>X “mathematics mode” is a way of processing code to display mathematics. As such, not only does it allow greater control over typographical features, but it also can be processed in several different ways: so without going into details, depending on one’s wishes, ArabTeX input can be full

<sup>1</sup> See <http://ctan.org/pkg/arabtex>

<sup>2</sup> Lagally (2004, p. 2).

<sup>3</sup> Gáspár Sinai’s Yudit probably has the best Unicode support. See <http://www.yudit.org>.

vocalized Arabic (*scriptio plena*), vocalized Arabic or non-vocalized Arabic (*scriptio defectiva*); it further can be transliterated into whichever romanization standard the user may choose.

But there may be more to be said on that point, as encoding Arabic also naturally encourages the coder to vocalize the texts—without compelling him to do so, of course. Accurate coding may even have other virtuous effects. For instance, hyphens may be used for tying particles or prefixes to words, or to mark inflectional endings, and so forth. In other words, accurate coding produces accurate texts that can stand to close grammatical scrutiny and to complex textual searches as well.

Having that in mind, I started `arabluatex`. With the help of Lua, it will eventually interact with some other packages yet to come to produce from `.tex` source files, in addition to printed books, TEI xml compliant critical editions and/or lexicons that can be searched, analyzed and correlated in various ways.

## 1.1 `arabluatex` is for Lua<sup>L</sup>A<sup>T</sup>E<sup>X</sup>

It goes without saying that `arabluatex` requires Lua<sup>L</sup>A<sup>T</sup>E<sup>X</sup>. T<sup>E</sup>X and L<sup>A</sup>T<sup>E</sup>X have `arabtex`, and X<sub>Y</sub>L<sup>A</sup>T<sup>E</sup>X has `arabxetex`. Both of them are much more advanced than `arabluatex`, as they can process a number of different languages,<sup>4</sup> whereas `arabluatex` can process only Arabic for the time being. More languages will be included in future releases of `arabluatex`.

In comparison to `arabxetex`, `arabluatex` works in a very different way. The former relies on the `TECkit` engine which converts ArabT<sup>E</sup>X input on the fly into Unicode Arabic script, whereas the latter passes ArabT<sup>E</sup>X input on to a set of Lua functions. At first, L<sup>A</sup>T<sup>E</sup>X commands are taken care of in different ways: some, as `\emph`, `\textbf` and the like are expected to have Arabic text as arguments, while others, as `\LR`, for “left-to-right text”, are not. Then, once what is Arabic is carefully separated from what is not, it is processed by other Lua functions which rely on different sets of correspondence tables to do the actual conversion in accordance with one’s wishes. Finally, Lua returns to T<sup>E</sup>X the converted strings—which may in turn contain some other ArabT<sup>E</sup>X input yet to be processed—for further processing.

## 2 The basics of `arabluatex`

### 2.1 Activating `arabluatex`

As usual put in your preamble:

```
\usepackage{arabluatex}
```

The only requirement of `arabluatex` is Lua<sup>L</sup>A<sup>T</sup>E<sup>X</sup>; it will complain if you try to compile your document with another engine. That aside, `arabluatex` does not load packages such as `polyglossia` or `luabidi`. It can work with `polyglossia` though, but does not require it.

---

<sup>4</sup>To date, both packages support Arabic, Maghribi, Urdu, Pashto, Sindhi, Kashmiri, Uighuric and Old Malay; in addition to these, `arabtex` also has a Hebrew mode, including Judeo-Arabic and Yiddish.

**Font setup** If you wish to use your own Arabic font, you can define it before loading `arabluatex`. Assuming that `fontspec` is loaded, put this in your preamble just above the line that loads `arabluatex`:

```
\newfontfamily\arabicfont{<fontname>}[Script=Arabic]
```

where `<fontname>` is the standard name of the Arabic font you wish to use.

By default, if no Arabic font is selected, `arabluatex` will issue a warning message and attempt to load the Amiri font<sup>5</sup> like so:—

```
\newfontfamily\arabicfont{Amiri}[Script=Arabic]
```

REM. By default Amiri places the *kasrah* in combination with the *tašdīd* below the consonant, like so: `ك`. That is correct, as at least in the oldest manuscripts `ك` may stand for `ك` as well as `ك`. See Wright (1896, i.14.C–D). The placement of the *kasrah* above the consonant may be obtained by selecting the `ss05` feature of the Amiri font, like so:—<sup>6</sup>

```
\newfontfamily\arabicfont{Amiri}[Script=Arabic,RawFeature={+ss05}]
```

Other Arabic fonts may behave differently.

## 2.2 Options

`arabluatex` may be loaded with four mutually exclusive global options, each of which may be overridden at any point of the document (see below section 2.3.1 on page 8):

**voc** default  
In this mode, which is the one selected by default, every short vowel written generates its corresponding diacritical mark: *dammah* (◌ُ), *fathah* (◌َ) and *kasrah* (◌ِ). If a vowel is followed by N, viz.  $\langle uN, aN, iN \rangle$ , then the corresponding *tanwīn* (◌ِ, ◌ُ, ◌ِ, ◌ِ or ◌ِ) is generated. Finally,  $\langle u, a, i \rangle$  at the commencement of a word indicate a “connective *ʾalif*” (*ʾalifu ʾl-waṣli*), but **voc** mode does not show the *waṣlah* above the *ʾalif*; instead, the accompanying vowel may be expressed at the beginning of a sentence (◌ِ◌ِ◌ِ).

**fullvoc** In addition to what the **voc** mode does, **fullvoc** expresses the *sukūn* and the *waṣlah*.

**novoc** None of the diacritics is showed in **novoc** mode, unless otherwise specified (see “quoting” technique below section 4.4 on page 20).

**trans** This mode transliterates the ArabTeX input into one of the accepted standards. At present, three standards are supported (see below section 7 on page 30 for more details):

**dmg** *Deutsche Morgenländische Gesellschaft*, which is selected by default;

**loc** *Library of Congress*;

**arabica** *Arabica*.

More standards will be included in future releases of `arabluatex`.

<sup>5</sup>Hosny (2015).

<sup>6</sup>See the documentation of `amiri`, Hosny (2015, p. 5).

## 2.2.1 Classic contrasted with modern typesetting of Arabic

New feature  
v.1.2

By default, arabxatex typesets Arabic in a classic, traditional style the most prominent features of which are the following:

- ‘Classic’ *maddah*: when ‘*alif*’ and *hamzah* accompanied by a simple vowel or *tanwīn* is preceded by an ‘*alif*’ of prolongation (ﻻ), then a mere *hamzah* is written on the line, and a *maddah* is placed over the ‘*alif*’, like so:—

samA'uN سَمَاءُ <sup>un</sup>samā, jA'a جَاءَ <sup>a</sup>jā'a, yatasA'alUna يَتَسَاءَلُونَ <sup>a</sup>yatasā'alūna<sup>7</sup>  
(see on page 15 for further details).

- The euphonic *tašdīd* is generated (see on page 15).
- In *fullvoc* mode, the *sukūn* is expressed.

New feature  
v1.4.4

\SetArbEasy

Such refinements as ‘classic’ *maddah* may be discarded by the \SetArbEasy command, either globally in the preamble or locally at any point of the document. The difference between \SetArbEasy and its ‘starred’ version \SetArbEasy\* is that the former keeps the *sukūn* that is generated by the *fullvoc* mode, while the latter further takes it away. Default ‘classic’ rules may be set back at any point of the document with the \SetArbDflt command. Assimilation rules laid on item b on page 16 may also be applied by the ‘starred’ version of this command \SetArbDflt\* either in the preamble or at any point of the document.<sup>8</sup> Examples follow:—

New feature  
v1.6

\SetArbEasy\*  
\SetArbDflt

\SetArbDflt\*

(a) \SetArbDflt:

- voc وَمَاتَ اسْتِسْقَاءَ قَبْلَ أَنْ يُتِمَّ كِتَابَهُ فِي نُجُومِ السَّمَاءِ
- fullvoc وَمَاتَ اسْتِسْقَاءَ قَبْلَ أَنْ يُتِمَّ كِتَابَهُ فِي نُجُومِ السَّمَاءِ
- trans wa-māta 'stisqā<sup>an</sup> qabla 'an yutimma kitāba-hu fī nuġūm<sup>i</sup> 's-samā<sup>i</sup>

(b) \SetArbDflt\*:

- voc وَمَاتَ اسْتِسْقَاءَ قَبْلَ أَنْ يُتِمَّ كِتَابَهُ فِي نُجُومِ السَّمَاءِ
- fullvoc وَمَاتَ اسْتِسْقَاءَ قَبْلَ أَنْ يُتِمَّ كِتَابَهُ فِي نُجُومِ السَّمَاءِ
- trans wa-māta 'stisqā<sup>an</sup> qabla 'ay yutimma kitāba-hu fī nuġūm<sup>i</sup> 's-samā<sup>i</sup>

(c) \SetArbEasy:

- voc وَمَاتَ اسْتِسْقَاءَ قَبْلَ أَنْ يُتِمَّ كِتَابَهُ فِي نُجُومِ السَّمَاءِ
- fullvoc وَمَاتَ اسْتِسْقَاءَ قَبْلَ أَنْ يُتِمَّ كِتَابَهُ فِي نُجُومِ السَّمَاءِ
- trans wa-māta 'stisqā<sup>an</sup> qabla 'an yutimma kitāba-hu fī nuġūm<sup>i</sup> 's-samā<sup>i</sup>

(d) \SetArbEasy\*:

- voc وَمَاتَ اسْتِسْقَاءَ قَبْلَ أَنْ يُتِمَّ كِتَابَهُ فِي نُجُومِ السَّمَاءِ
- fullvoc وَمَاتَ اسْتِسْقَاءَ قَبْلَ أَنْ يُتِمَّ كِتَابَهُ فِي نُجُومِ السَّمَاءِ
- trans wa-māta 'stisqā<sup>an</sup> qabla 'an yutimma kitāba-hu fī nuġūm<sup>i</sup> 's-samā<sup>i</sup>

Please note that this document is typeset with \SetArbDflt throughout.

<sup>7</sup>Note that in old mss. such forms as سَمَاءُ, جَاءَ are also found; see Wright (1896, i. 24 D).

<sup>8</sup>For an example, see section 5.1 on page 29.

## 2.3 Typing Arabic

`\arb` Once `arabluatex` is loaded, a `\arb{<Arabic text>}` command is available for inserting Arabic text in paragraphs, like so:—

```
1 From \textcite[i. 1 A]{Wright}:--- Arabic, like Hebrew and
2 Syriac, is written and read from right to left. The letters
3 of the alphabet (\arb{.hurUf-u 'l-hijA'-i}, \arb{.hurUf-u
4 'l-tahajjI}, \arb{al-.hurUf-u 'l-hijA'iyyaT-u}, or
5 \arb{.hurUf-u 'l-mu`jam-i}) are twenty-eight in number and
6 are all consonants, though three of them are also used as
7 vowels (see §3).
```

From Wright (1896, i. 1 A):— Arabic, like Hebrew and Syriac, is written and read from right to left. The letters of the alphabet (حُرُوفُ الْهِجَاءِ, حُرُوفُ الْهِجَائِيَّةِ, or حُرُوفُ الْمُعْجَمِ) are twenty-eight in number and are all consonants, though three of them are also used as vowels (see § 3).

**Caveat** For some reason, left-to-right paragraphs that start with Arabic words lose their indentation. For the time being, this can be circumvented by appending the `\indent` command at the commencement of such paragraphs.

The same remark applies to left-to-right list environments: when items start with Arabic words, the `\arb` command must be prefixed with `\indent`. The following example comes from Wright (1896, i. 213 C):—

```
1 \begin{enumerate}[XVI.]
2 \item \indent\arb{fawA`ilu}*.
3 \begin{enumerate}[1.]
4 \item \indent\arb{fA`aluN}; as \arb{_hAtamuN} \emph{a
5 signet-ring}, ...
6 \end{enumerate}
7 \end{enumerate}
```

XVI. فَوَاعِلُ\*.

1. فَاعِلٌ; as خَاتَمٌ *a signet-ring*, ...

`arab` Running paragraphs of Arabic text should rather be placed inside an *Arabic environment*

```
1 \begin{arab}
2 [...]
3 \end{arab}
```

like so:—

```

1 \begin{arab}
2   'at_A .sadIquN 'il_A ju.hA ya.tlubu min-hu .himAra-hu
3   li-yarkaba-hu fI safraTiN qa.sIraTiN fa-qAla la-hu:
4   \enquote{sawfa 'u`Idu-hu 'ilay-ka fI 'l-masA'-i
5   wa-'adfa`u la-ka 'ujraTaN.} fa-qAla ju.hA:
6   \enquote{'anA 'AsifuN jiddaN 'annI lA 'asta.tI`u 'an
7   'u.haqqiqa la-ka ra.gbata-ka fa-'l-.himAr-u laysa hunA
8   'l-yawm-a.} wa-qabla 'an yutimma ju.hA kalAma-hu bada'a
9   'l-.himAr-u yanhaqu fI 'i.s.tabli-hi. fa-qAla la-hu
10  .sadIqu-hu: \enquote{'innI 'asma`u .himAra-ka yA ju.hA
11  yanhaqu.} fa-qAla la-hu ju.hA: \enquote{.garIbuN
12  'amru-ka yA .sadIqI 'a-tu.saddiqu 'l-.himAr-a
13  wa-tuka_d_diba-nI?}
14 \end{arab}

```

أَتَى صَدِيقٌ إِلَى جُحَّا يَطْلُبُ مِنْهُ حِمَارَهُ لِيَرْكَبَهُ فِي سَفَرَةٍ قَصِيرَةٍ فَقَالَ لَهُ: "سَوْفَ أُعِيدُهُ إِلَيْكَ فِي الْمَسَاءِ  
وَأَدْفَعُ لَكَ أُجْرَةً." فَقَالَ جُحَّا: "أَنَا آسَفٌ جِدًّا أَنِّي لَا أَسْتَطِيعُ أَنْ أُحَقِّقَ لَكَ رَغْبَتَكَ فَالْحِمَارُ لَيْسَ هُنَا  
الْيَوْمَ." وَقَبْلَ أَنْ يَتِمَّ جُحَّا كَلَامَهُ بَدَأَ الْحِمَارُ يَنْهَقُ فِي إِصْطَبَلِهِ. فَقَالَ لَهُ صَدِيقُهُ: "إِنِّي أَسْمَعُ حِمَارَكَ يَا جُحَّا  
يَنْهَقُ." فَقَالَ لَهُ جُحَّا: "غَرِيبُ أَمْرِكَ يَا صَدِيقِي أَتَصَدِّقُ الْحِمَارَ وَتُكَذِّبُنِي؟"

### 2.3.1 Local options

As seen above in section 2.2 on page 5, arabuatex may be loaded with four mutually exclusive global options: `voc` (which is the default option), `fullvoc`, `novoc` and `trans`. Whatever choice has been made globally, it may be overridden at any point of the document, as the `\arb` command may take any of the `voc`, `fullvoc`, `novoc` or `trans` modes as optional arguments, like so:—

<code>voc</code>	– <code>\arb[voc]{\langle Arabic text \rangle};</code>
<code>fullvoc</code>	– <code>\arb[fullvoc]{\langle Arabic text \rangle};</code>
<code>novoc</code>	– <code>\arb[novoc]{\langle Arabic text \rangle};</code>
<code>trans</code>	– <code>\arb[trans]{\langle Arabic text \rangle}.</code>

The same optional arguments may be passed to the environment `arab`: one may have `\begin{arab}[\langle mode \rangle] ... \end{arab}`, where `\langle mode \rangle` may be any of `voc`, `fullvoc`, `novoc` or `trans`.

## 3 Standard ArabTeX input

### 3.1 Consonants

Table 1 gives the ArabTeX equivalents for all of the Arabic consonants.



Letter	Transliteration <sup>9</sup>			ArabT <sub>E</sub> X notation
	dmg	loc	arabica	
ا <sup>10</sup>	<i>a</i>	<i>a</i>	<i>a</i>	<code>a</code>
ب	<i>b</i>	<i>b</i>	<i>b</i>	<code>b</code>
ت	<i>t</i>	<i>t</i>	<i>t</i>	<code>t</code>
ث	<i>ṭ</i>	<i>th</i>	<i>ṭ</i>	<code>_t</code>
ج	<i>ǧ</i>	<i>j</i>	<i>ǧ</i>	<code>ˆg</code> or <code>j</code>
ح	<i>ḥ</i>	<i>ḥ</i>	<i>ḥ</i>	<code>.h</code>
خ	<i>ḫ</i>	<i>kh</i>	<i>ḫ</i>	<code>_h</code> or <code>x</code>
د	<i>d</i>	<i>d</i>	<i>d</i>	<code>d</code>
ذ	<i>ḍ</i>	<i>dh</i>	<i>ḍ</i>	<code>_d</code>
ر	<i>r</i>	<i>r</i>	<i>r</i>	<code>r</code>
ز	<i>z</i>	<i>z</i>	<i>z</i>	<code>z</code>
س	<i>s</i>	<i>s</i>	<i>s</i>	<code>s</code>
ش	<i>š</i>	<i>sh</i>	<i>š</i>	<code>ˆs</code>
ص	<i>ṣ</i>	<i>ṣ</i>	<i>ṣ</i>	<code>.s</code>
ض	<i>ḍ</i>	<i>ḍ</i>	<i>ḍ</i>	<code>.d</code>
ط	<i>ṭ</i>	<i>ṭ</i>	<i>ṭ</i>	<code>.t</code>
ظ	<i>ẓ</i>	<i>ẓ</i>	<i>ẓ</i>	<code>.z</code>
ع	<i>ʿ</i>	<i>ʿ</i>	<i>ʿ</i>	<code>`</code>
غ	<i>ǧ</i>	<i>gh</i>	<i>ǧ</i>	<code>.g</code>
ف	<i>f</i>	<i>f</i>	<i>f</i>	<code>f</code>
ق	<i>q</i>	<i>q</i>	<i>q</i>	<code>q</code>
ك	<i>k</i>	<i>k</i>	<i>k</i>	<code>k</code>
ل	<i>l</i>	<i>l</i>	<i>l</i>	<code>l</code>
م	<i>m</i>	<i>m</i>	<i>m</i>	<code>m</code>
ن	<i>n</i>	<i>n</i>	<i>n</i>	<code>n</code>
ه	<i>h</i>	<i>h</i>	<i>h</i>	<code>h</code>
و	<i>w</i>	<i>w</i>	<i>w</i>	<code>w</code>
ي	<i>y</i>	<i>y</i>	<i>y</i>	<code>y</code>
ة	<i>ah</i>	<i>ah</i>	<i>a</i>	<code>T</code>

Table 1: Standard ArabT<sub>E</sub>X (consonants)

## 3.2 Additional characters

Table 2 gives the ArabT<sub>E</sub>X equivalents for some additional Persian characters.

<sup>9</sup>See below section 7 on page 30.

<sup>10</sup>For *ʾalif* as a consonant, see Wright (1896, i. 16 D). The *hamzah* itself is encoded `<'>`. See below section 4.2 on page 13.

Letter	Transliteration <sup>11</sup>			ArabTeX notation
	dmg	loc	arabica <sup>12</sup>	
پ	<i>p</i>	<i>p</i>	<i>p</i>	p
چ	<i>č</i>	<i>ch</i>	<i>č</i>	ˆc
ژ	<i>ž</i>	<i>zh</i>	<i>ž</i>	ˆz
ف <sup>13</sup>	<i>v</i>	<i>v</i>	<i>v</i>	v
گ	<i>g</i>	<i>g</i>	<i>g</i>	g
ڻ <sup>14</sup>	<i>ñ</i>	<i>ñ</i>	<i>ñ</i>	ˆn

Table 2: Standard ArabTeX (additional characters)

REM. The alveolar consonants چ and ژ are processed as solar letters by `arabluatex`.

### 3.3 Vowels

#### 3.3.1 Long vowels

Table 3 gives the ArabTeX equivalents for the Arabic long vowels.

Letter	Transliteration <sup>15</sup>			ArabTeX notation
	dmg	loc	arabica	
ا	<i>ā</i>	<i>ā</i>	<i>ā</i>	A
و	<i>ū</i>	<i>ū</i>	<i>ū</i>	U
ي	<i>ī</i>	<i>ī</i>	<i>ī</i>	I
ى <sup>16</sup>	<i>ā</i>	<i>á</i>	<i>ā</i>	_A or Y
أ	<i>ā</i>	<i>ā</i>	<i>ā</i>	_a
ـ	<i>ū</i>	<i>ū</i>	<i>ū</i>	_u
ـ	<i>ī</i>	<i>ī</i>	<i>ī</i>	_i

Table 3: Standard ArabTeX (long vowels)

REM. *a*. The long vowels *ā*, *ū*, *ī*, otherwise called *hurūf<sup>u</sup> ’l-madd<sup>i</sup>*, the letters of prolongation, involve the placing of the short vowels *a*, *u*, *i* before the letters ا, و, ي respectively. `arabluatex` does that automatically in case any from `voc`, `fullvoc` or `trans` modes is selected e.g. *قَالَ qāla*, *يَقُولُ yaqūlu*.

<sup>11</sup>See below section 7 on page 30.

<sup>12</sup>The characters that are listed in this table are not included in this standard. However, as `arabica` is based on `dmg`, the `dmg` equivalents have been used here.

<sup>13</sup>This character is not found in Brockelmann et al. (1935, p. 2). It is taken from the DIN 31 635 (2011) standard.

<sup>14</sup>See footnote 13.

<sup>15</sup>See below section 7 on page 30.

<sup>16</sup>= *al-’alīf<sup>u</sup> ’l-maqṣūrat<sup>u</sup>*.

REM. *b.* Defective writings, such as  $\text{ا}$ , *al-'alif<sup>u</sup> 'l-mahḍūfat<sup>u</sup>*, or defective writings of  $\bar{u}$  and  $\bar{i}$  are encoded `_a_u` and `_i` respectively, e.g. `_d_alika` ذَلِك, `al-mal_a'ikaT-u` 'l-ra.hm\_an-u الْمَلِكُ الرَّحْمَنُ, `.hu_dayfaT-u bn-u` 'l-yamAn\_i حَذِيفَةُ بْنُ الْيَمَانِ for *Hudayfat<sup>u</sup> bn<sup>u</sup> 'l-Yamānī*, etc.

### 3.3.2 Short vowels

Table 4 gives the ArabTeX equivalents for the Arabic short vowels.

Letter	Transliteration <sup>17</sup>			ArabTeX notation
	dmg	loc	arabica	
ا	<i>a</i>	<i>a</i>	<i>a</i>	<code>a</code>
u	<i>u</i>	<i>u</i>	<i>u</i>	<code>u</code>
i	<i>i</i>	<i>i</i>	<i>i</i>	<code>i</code>
an	<i>an</i>	<i>an</i>	<i>an</i>	<code>aN</code>
un	<i>un</i>	<i>un</i>	<i>un</i>	<code>uN</code>
in	<i>in</i>	<i>in</i>	<i>in</i>	<code>iN</code>

Table 4: Standard ArabTeX (short vowels)

Whether Arabic texts be vocalized or not is essentially a matter of personal choice. So one may use `voc` mode and decide not to write vowels except at some particular places for disambiguation purposes, or use `novoc` mode, not write vowels—as `novoc` normally does not show them—except, again, where disambiguation is needed.<sup>18</sup>

However, it may be wise to always write the vowels, leaving to the various modes provided by `arabluatex` to take care of showing or not showing the vowels.

That said, there is no need to write the short vowels *fathah*, *dammah* or *kasrah* except in the following cases:—

- at the commencement of a word, to indicate that a connective *'alif* is needed, with the exception of the article (see below section 4.4 on page 20);
- when `arabluatex` needs to perform a contextual analysis to determine the carrier of the *hamzah*;
- in the various transliteration modes, as vowels are always expressed in romanized Arabic.

<sup>17</sup>See below section 7 on page 30.

<sup>18</sup>See below section 4.4 on page 20.

## 4 arabluatex in action

### 4.1 The vowels and diphthongs

**Short vowels** As said above, they are written  $\langle a, u, i \rangle$ :

\_halaqa (or xalaqa) خَلَقَ *halaqa*, ^samsuN شَمْسٌ *šams<sup>un</sup>*, karImuN كَرِيمٌ *Karīm<sup>un</sup>*.

bi-hi بِه *bi-hi*, 'aqi.tuN أَقِطْ *aqiṭ<sup>un</sup>*.

la-hu لَهُ *la-hu*, .hujjaTuN حُجَّةٌ *huġġat<sup>un</sup>*.

**Long vowels** They are written  $\langle U, A, I \rangle$ :

qAla قَالَ *qāla*, bI`a بَيْعٌ *bī`a*, .tUruN طُورٌ *ṭūr<sup>un</sup>*, .tInuN طِينٌ *ṭīn<sup>un</sup>*,  
murU'aTuN مُرُوَّةٌ *murū`at<sup>un</sup>*.

**'alif maqṣūrah** It is written  $\langle \_A \rangle$  or  $\langle Y \rangle$ :

al-fat\_A أَلْفَتَى *al-fatā*, al-maqh\_A أَلْمَقْهَى *al-maqhā*, 'il\_A إِلَى *ilā*.

**'alif otiosum** Said *'alif<sup>u</sup> 'l-wiḡāyat'*, “the guarding *'alif*”, after و at the end of a word, both when preceded by *ḍammah* and by *fatḥah* is written  $\langle UA \rangle$  or  $\langle aW, aWA \rangle$ :

na.sarUA نَصَرُوا *naṣarū*, katabUA كَتَبُوا *katabū*, ya.gzUA يَغْزُوا *yaġzū*, ramaW رَمَوْا *ramaw*, banaWA بَنَوْا *banaw*.

**'alif maḥdūfah and defective ū, ī** They are written  $\langle \_a, \_i \_u \rangle$ :

al-l\_ah-u أَللهُ *al-lāh<sup>u</sup>*, 'il\_ahuN إِلَهٌ *ilāh<sup>un</sup>*.  
al-ra.hm\_an-u الرَّحْمَنُ *ar-raḥmān<sup>u</sup>*, l\_akin لَكِنْ *lākin*, h\_ahunA هَاهُنَا *hāhunā*,  
.hunayn-u bn-u 'is.h\_aq-a حَنِينٌ بْنُ إِسْحَاقَ *Hunayn<sup>u</sup> bn<sup>u</sup> 'Ishāq<sup>a</sup>*, rabb\_i رَبِّ *rabbī*, al-`A.s\_i الْعَاصِ *al-`Āṣī*.

**Silent ي/و** Some words ending with ى are usually written َوَة or َوَة instead of ى: see Wright (1896, i. 12 A). arabluatex preserves that particular writing; the same applies to words ending in ِيَة for ى. Long vowels  $\langle U, I \rangle$  shall receive no *sukūn* after a *'alif maḥdūfah* and are discarded in *trans* mode:

.hay\_aUTuN حَيَوةٌ *hayāt<sup>un</sup>*, .sal\_aUTuN صَلَوةٌ *ṣalāt<sup>un</sup>*, mi`sk\_aUTuN مَشْكُوةٌ *miš-kāt<sup>un</sup>*, tawr\_aITuN تَوْرِيَّةٌ *tawrāt<sup>un</sup>*.

And so also: al-rib\_aIT-u الرِّبِيَّةُ *ar-ribāt<sup>u</sup>*.

**‘Amr<sup>un</sup>, and the silent و** To that name a silent و is added to distinguish it from ‘Umar<sup>u</sup>: see Wright (1896, i. 12 C). In no way this affects the sound of the *tanwīn*, so it has to be discarded in *trans* mode:

‘amruNU عمرو ‘amr<sup>un</sup>, ‘amraNU عمرو ‘amr<sup>an</sup>, ‘amriNU عمرو ‘amr<sup>in</sup>.

When the *tanwīn* falls away (Wright 1896, i. 249 B): ‘amr-uU bn-u mu.hammadIN عمرو بن محمد ‘Amr<sup>u</sup> bn<sup>u</sup> Muḥammad<sup>in</sup>, mu.hammad-u bn-u ‘amr-iU bn-i\_hAlidiN خالد بن عمرو بن محمد Muḥammad<sup>u</sup> bn<sup>u</sup> ‘Amr<sup>i</sup> bn<sup>i</sup> Hālid<sup>in</sup>.

And so also: al-rib\_aUA الربا ar-ribā, ribaNU ربا rib<sup>an</sup>.

**tanwīn** The marks of doubled short vowels, ُ, ُ, ِ, are written ⟨uN, aN, iN⟩ respectively. arabluateX deals with special cases, such as ِ taking an l after all consonants except ة, and *tanwīn* preceding ى as in هدى, which is written ⟨aN\_A⟩ or ⟨aNy⟩:

mAluN مَالْ mā<sup>un</sup>, bAbaN بَابًا bāb<sup>an</sup>, madInaTaN مَدِينَةٌ madīnat<sup>an</sup>, bintiN بنت bint<sup>in</sup> maqhaN\_A مقهى maqḥa<sup>n</sup>, fataNY فَتَى fatā<sup>n</sup>.

arabluateX is aware of special orthographies: ‘say’uN شَيْءٌ šay<sup>un</sup>, ‘say’aN شَيْئًا šay<sup>an</sup>, ‘say’iN شَيْءٍ šay<sup>in</sup>.

In some cases, it may be useful to mark the root form of defective words so as to produce a more accurate transliteration of ending *tanwīn*. As seen above, *tanwīn* preceding ى is written ⟨aN\_A⟩ or ⟨aNy⟩. Such forms as قَاضٍ may likewise be written ⟨iNI⟩:—

al-qA.dI الْقَاضِي al-qāḍī, qA.diyaN قَاضِيًا qāḍiy<sup>an</sup>, qA.diNI قَاضٍ qāḍi<sup>n</sup>.

## 4.2 Other orthographic signs

**tā’ marbūṭah** It is written ⟨T⟩:

madInaTuN مَدِينَةٌ madīnat<sup>un</sup>, madInaTaN مَدِينَةٌ madīnat<sup>an</sup>, madInaTiN مَدِينَةٍ madīnat<sup>in</sup>.

**hamzah** It is written ⟨’⟩, its carrier being determined by contextual analysis. In case one wishes to bypass this mechanism, he can use the “quoting” feature that is described below in section 4.4 on page 20.

**Initial hamzah:** 'asaduN اَسَدٌ *asad<sup>un</sup>*, 'u\_htuN أُخْتُ *uht<sup>un</sup>*, 'iqlIduN اِقْلِيدُ *iqliḏ<sup>un</sup>*, 'anna اِنَّ *anna*, 'inna اِنَّ *inna*.

*hamzah* followed by the long vowel و is encoded ' \_U: ' \_U1\_A اُولَى *ulā*, ' \_U1U اُولُو *ulū*, ' \_U1A اُولَا *ulā'ika*.

*hamzah* followed by the long vowel ي is encoded ' \_I: ' \_ImAnuN اِيْمَانٌ *imān<sup>un</sup>*<sup>19</sup>.

**Middle hamzah:** xA.ti'-Ina خَاطِئِينَ *hāṭi'ina*, ru'UsuN رُؤُوسٌ *ru'ūs<sup>un</sup>*, xa.tI'aTuN خَاطِئَةً *hāṭi'at<sup>un</sup>*, su'ila سُئِلَ *su'ila*, 'as'ilaTuN أَسْئَلَةً *as'ilat<sup>un</sup>*, mas'alaTuN مَسْأَلَةً *mas'alat<sup>un</sup>*, 'as'alu أَسْأَلَ *as'alu*, yatasA'alUna يَتَسَاءَلُونَ *yatasā'alūna*, murU'aTuN مُرُوءَةٌ *murū'at<sup>un</sup>*, ta'xIruN تَاخِرٌ *ta'hīr<sup>un</sup>*, ta'ax xara تَأَخَّرَ *ta'ahhara*, ji'tu-ka جِئْتُكَ *gi'tu-ka*, qA'iluN قَائِلٌ *qā'il<sup>un</sup>*, .hIna'i\_dIN هِنَا *hina'id<sup>in</sup>*.

From Wright (1896, i. 14 B):— All consonants, whatsoever, not even *ʿalif hēmzatūm* excepted, admit of being doubled and take *tašdīd*. Hence we speak and write ra'AsuN رَأْسٌ *ra'ās<sup>un</sup>*, sa'AluN سَأَلَ *sa'al<sup>un</sup>*, na'AjuN نَأَجَّ *na'ağ<sup>un</sup>*.

**Final hamzah:** xa.ta'uN خَطَأٌ *haṭa'<sup>un</sup>*, xa.ta'aN خَطَأٌ *haṭa'an*, xa.ta'iN خَطِئًا *haṭa'in*, 'aqra'u أَقْرَأُ *agra'u*, taqra'Ina تَقْرَأِينَ *taqra'ina*, taqra'Una تَقْرَأُونَ *taqra'ūna*, yaqra'na يَقْرَأَنَّ *yaqra'na*, yaxba'Ani يَخْبَأَنَّ *yahba'āni*, xaba'A خَبَأَ *haba'a*, xubi'a خُبِيَ *hubi'a*, xubi'UA خُبُوا *hubi'u*, jA'a جَاءَ *gā'a*, ridA'uN رَدَّ *ridā'<sup>un</sup>*, ridA'aN رَدَّ *ridā'an*, jI'a جِيءَ *gi'a*, radI'iN رَدِيَ *radi'in*, sU'uN سُوءٌ *sū'<sup>un</sup>*, .daw'uN دَاوُءٌ *daw'<sup>un</sup>*, qay'iN قَايَ *qay'in*, ^sifA'I شَفَائِي *šifā'i*, man^sa'I مَنْشَأِي *manša'i*.

^say'uN سَيَّ *say<sup>un</sup>*, ^say'aN سَيَّ *say'an*, ^say'iN سَيَّ *say'in*, al-^say'-u أَلْسَيُّ *aš-say'u*, 'a^syA'-u أَشْيَاءُ *ašyā'u*, 'a^syA'-a أَشْيَاءُ *ašyā'a*, .zim'aN ظِمْنَا *ẓim'an*.

**taḥfīf<sup>u</sup> 'l-hamzat<sup>i</sup>:** if the *hamzah* has *ğazmah* and is preceded by *ʿalif hamzatūm*, it must be changed into the letter of prolongation that is homogeneous with the preceding vowel; hence: 'a'mana آمَنَ *āmana*,

<sup>19</sup> For another way of encoding the initial *hamzah* followed by a long vowel, see the *taḥfīf<sup>u</sup> 'l-hamzat<sup>i</sup>* on this page.

'u'minu أُوْمِنُ *ūminu*, 'i'mAnuN إِيْمَانٌ *īmān<sup>un</sup>*. For other possible ways of encoding such sequences, see on page 14 (*hamzah* followed by و and ي) and the *maddah* on this page.

**maddah** At the beginning of a syllabe, 'alif with *hamzah* and *fathah* (أ) followed by 'alifu 'l-maddi ('alif of prolongation) or 'alif with *hamzah* and *ğazmah* (إ) are both represented in writing 'alif with *maddah*: آ (see Wright 1896, i. 25 A–B).

Hence one should keep to this distinction and encode 'a'kulu أَكُلُ *ākulu* and 'Akilun أَكِلُ *ākil<sup>un</sup>* respectively.

arabluatex otherwise determines *al-'alif<sup>u</sup> 'l-mamdūdat<sup>u</sup>* by context analysis.

'is'AduN إِسَادٌ *is'ād<sup>un</sup>*, 'AkilUna أَكِلُونُ *ākilūna*, 'a'manna أَمْنًا *āmannā*,  
al-qur'An-u الْقُرْآنُ *al-qur'ān<sup>u</sup>*.  
jA'a جَاءَ *ğā'a*, yatasA'alUna يَتَسَاءَلُونَ *yatasā'alūna*, ridA'uN رِدَاءٌ *ridā<sup>un</sup>*,  
xaba'A خَبَا *ħaba'a*, yaxba'Ani يَخْبَأُ *yahba'āni*.

**šaddah** *tašdīd* is either *necessary* or *euphonic*.

**The necessary tašdīd** always follows a vowel, whether short or long (see Wright 1896, i. 15 A–B). It is encoded in writing the consonant that carries it twice:

`allaqa عَلَّقَ *allaqa*, mAdduN مَادَّ *mādd<sup>un</sup>*, 'ammara أَمَّرَ *ammara*, murruN مَرَّرَ *murr<sup>un</sup>*.

**The euphonic tašdīd** always follows a vowelless consonant which is passed over in pronunciation and assimilated to a following consonant. It may be found (Wright 1896, i. 15 B–16 C):—

(a) With the *solar* letters ت, ث, د, ذ, ر, ز, س, ش, ص, ض, ط, ظ, ل, ن, after the article اَلْ:—

Unlike arabtex and arabxetex, arabluatex *never requires the solar letter to be written twice*, as it automatically generates the euphonic *tašdīd* above the letter that carries it, whether the article be written in the assimilated form or not, e.g. al-~sams-u الشَّمْسُ *aš-šams<sup>u</sup>*, or a~s-~sams-u الشَّمْسُ *aš-šams<sup>u</sup>*.

al-tamr-u اَلتَّمْرُ *at-tamr*<sup>u</sup>, al-ra.hm\_an-u اَلرَّحْمَنُ *ar-rahmān*<sup>u</sup>, al-zulm-u اَلظُّلْمُ *aẓ-ẓulm*<sup>u</sup>, al-lu.gaT-u اَللُّغَةُ *al-luġat*<sup>u</sup>.

- (b) With the letters ر, ل, م, ي after ن with *ġazmah*, and also after the *tanwīn*:—

Note the absence of *sukūn* above the passed over ن in the following examples, each of which is accompanied by a consistent transliteration: min rabbi-hi مِنْ رَبِّيَّ *mir rabbi-hi*, min layliN مِنْ لَيْلٍ *mil layl*<sup>in</sup>, 'an yaqtula أَنْ يَقْتُلَ *'ay yaqtula*.

With *tanwīn*: kitAbuN mubInuN كِتَابٌ مُبِينٌ *kitāb<sup>um</sup> mubīn<sup>un</sup>*.

REM. This particular feature must be put into operation by the `\SetArbDflt*` command explicitly. See above section 2.2.1 on page 6 for further details. Other kinds of assimilations, including the various cases of *'idgām*, will be included in *arabluatex* gradually.

- (c) With the letter ت after the dentals ث, د, ذ, ض, ط, ظ in certain parts of the verb: this kind of assimilation, e.g. لَبِثْتُ for لَبِثْتُ *labittu*, will be discarded here, as it is largely condemned by the grammarians (see Wright 1896, i. 16 B–C).

**The definite article and the 'alif** 'l-waṣl<sup>i</sup> At the beginning of a sentence, اَ is never written, as اَلْحَمْدُ لِلّٰهِ; instead, to indicate that the 'alif is a connective 'alif ('alif<sup>u</sup> 'l-waṣl<sup>i</sup>), the *hamzah* is omitted and only its accompanying vowel is expressed:

al-.hamd-u li-l-l\_ah-i اَلْحَمْدُ لِلّٰهِ *al-ḥamd<sup>u</sup> li-llāh<sup>i</sup>*.

As said above on page 5, *fullvoc* is the mode in which *arabluatex* expresses the *sukūn* and the *waṣlah*. *arabluatex* will take care of doing that automatically provided that the vowel which is to be absorbed by the final vowel of the preceding word be properly encoded, like so:—

- (a) Definite article at the beginning of a sentence is encoded `al-`, or `a<solar letter>-` if one wishes to mark the assimilation—which is in no way required, as *arabluatex* will detect all cases of assimilation.
- (b) Definite article inside sentences is encoded `'l-` or `'<solar letter>-`.
- (c) In all remaining cases of elision, the 'alifu 'l-waṣl<sup>i</sup> is expressed by the vowel that accompanies the omitted *hamzah*: ⟨u, a, i⟩.

**Article:** bAb-u 'l-madrasaT-i بَابُ الْمَدْرَسَةِ *bāb<sup>u</sup> 'l-madrasat<sup>i</sup>*, al-maqA laT-u 'l-'\_U1\_A اَلْمَقَالَةُ الْاُولَى *al-maqālat<sup>u</sup> 'l-'ūlā*, al-lu.gaT-u 'l-'ara biyyaT-u اَللُّغَةُ الْعَرَبِيَّةُ *al-luġat<sup>u</sup> 'l-'arabiyyat<sup>u</sup>*, fI .sinA`aT-i 'l-.tibb-i اِلَى اَلْاِتِّفَاقِ فِي صِنَاعَةِ الطِّبِّ *ilā 'l-intiqa.d-i 't-tibb<sup>i</sup>*, 'il\_A 'l-intiqa.d-i اِلَى اَلْاِتِّفَاقِ فِي صِنَاعَةِ الطِّبِّ *'ilā 'l-intiqa.d-i 't-tibb<sup>i</sup>*.



'l-*intiqād*<sup>i</sup>, fI 'l-ibtidA'-i فِي الْإِبْتِدَاءِ 'fi 'l-ibtidā'<sup>i</sup>, 'abU 'l-wazIr-i أَبُو الْوَزِيرِ 'abu 'l-wazīr<sup>i</sup>, fa-lamma ra'aW 'l-najm-a فَلَمَّا رَأَوْا النَّجْمَ fa-lammā ra'awu 'n-nağm<sup>a</sup>.

**Particles:—**

- (a) *li*:- 'alif<sup>u</sup> 'l-waṣl<sup>i</sup> is omitted in the article اَلْ when it is preceded by the preposition لِ: li-l-rajul-i لِلرَّجُلِ li-r-rağul<sup>i</sup>.  
If the first letter of the noun be ل, then the ل of the article also falls away, but arabluatex is aware of that: li-l-laylaT-i لِلَّيْلَةِ li-l-laylat<sup>i</sup>.
- (b) *la*:- the same applies to the affirmative particle لَ: la-l-.haqq-u لَ الْحَقُّ la-l-ḥaqq<sup>u</sup>.
- (c) With the other particles, 'alif<sup>u</sup> 'l-waṣl<sup>i</sup> is expressed: fI 'l-madInaT-i فِي الْمَدِينَةِ 'fi 'l-madīnat<sup>i</sup>, wa-'l-rajul-u وَالرَّجُلُ wa-'r-rağul<sup>u</sup>, bi-'l-qalam-i بِالْقَلَمِ bi-'l-qalam<sup>i</sup>, bi-'l-ru`b-i بِالرُّبْعِ bi-'r-ru`b<sup>i</sup>.

**Perfect active, imperative, nomen actionis:** qAla isma قَالَ أَسْمَعُ qāla 'sma', qAla uqtul قَاتِلْ qāla 'qtul, huwa inhazama هُوَ أَنهَزَمَ huwa 'nhazama, wa-ustu`mila وَأَسْتَعْمَلَ wa-'stu`mila, qad-i in.sarafa قَدْ أَنْصَرَفَ qadi 'nṣarafa, al-iqtidAr-u الْأَقْتِدَارُ al-iqtidār<sup>u</sup>, 'il\_A 'l-inti qA.d-i إِلَى الْإِنْتِقَاضِ 'ila 'l-*intiqād*<sup>i</sup>, law istaqbala لَوْ اسْتَقْبَلَ lawi 'staqbala.

**Other cases:** 'awi ismu-hu أَوْ اسْمُهُ 'awi 'smu-hu, zayduN ibn-u `amriNU زَيْدُ بْنُ عَمْرٍو Zayd<sup>uni</sup> 'bn<sup>u</sup> 'Amr<sup>in</sup>,<sup>20</sup> `umar-u ibn-u 'l-l\_ah.t.tAb-i اِمْرُؤُ الْقَيْسِ Umar<sup>u</sup> 'bn<sup>u</sup> 'l-Ḥaṭṭāb<sup>i</sup>,<sup>21</sup> imru'-u 'l-qays-i اِمْرُؤُ الْقَيْسِ Imru<sup>u</sup> 'l-Qays<sup>i</sup>, la-aymun-u 'l-l\_ah-i لَا يُؤْمِنُ اللَّهُ la-'ymun<sup>u</sup> 'l-lāh<sup>i</sup>.

**'alif<sup>u</sup> 'l-waṣl<sup>i</sup> preceded by a long vowel** The long vowel preceding the connective 'alif is shortened in pronunciation (Wright 1896, i. 21 B–D). This does not appear in the Arabic script, but arabluatex takes it into account in some transliteration standards:—

fI 'l-nAs-i فِي النَّاسِ 'fi 'n-nās<sup>i</sup>, 'abU 'l-wazIr-i أَبُو الْوَزِيرِ 'abu 'l-wazīr<sup>i</sup>,  
fI 'l-ibtidA'-i فِي الْإِبْتِدَاءِ 'fi 'l-ibtidā'<sup>i</sup>, \_dU 'l-i-lA1-i ذُو الْأَعْلَالِ du 'l-i-lāl<sup>i</sup>, maqh\_A 'l-'amIr-i مَقْهَى الْأَمِيرِ maqha 'l-'amīr<sup>i</sup>.

<sup>20</sup> "Zayd is the son of 'Amr": the second noun is not in apposition to the first, but forms part of the predicate. Hence زَيْدُ بْنُ عَمْرٍو and not زَيْدُ بْنُ عَمْرٍو, "Zayd, son of 'Amr".

<sup>21</sup> "Umar is the son of al-Ḥaṭṭāb" (see footnote 20).

**'alif<sup>u</sup> 'l-waṣl<sup>i</sup> preceded by a diphthong** The diphthong is resolved into two simple vowels (Wright 1896, i. 21 D–22 A) viz. *ay* → *āi* and *aw* → *āū*. *arabluatex* detects the cases in which this rule applies:—

fI `aynay 'l-malik-i الْمَلِكِ فِي عَيْنِي fī 'aynayi 'l-malik<sup>i</sup>, ix<sup>~</sup>say 'l-qaw  
m-a إِنْخَشِيَ الْقَوْمَ ihṣayi 'l-qawm<sup>a</sup>, mu.s.tafaw 'l-l\_ah-i مُصْطَفَوُ اللَّهِ muṣṭa-  
fawu 'l-lāh<sup>i</sup>.  
ramaW 'l-.hijAraT-a رَمَوْا الْحِجَارَةَ ramawu 'l-ḥiġārat<sup>a</sup>, fa-lamma ra'aW  
'l-naġm-a فَلَمَّا رَأَوْا النَّجْمَ fa-lammā ra'awu 'n-naġm<sup>a</sup>.

**'alif<sup>u</sup> 'l-waṣl<sup>i</sup> preceded by a consonant with sukūn** The vowel which the consonant takes is either its original vowel, or that which belongs to the connective *'alif* or the *kasrah*; in most of the cases (Wright 1896, i. 22 A–C), it is encoded explicitly, like so:—

'antumū 'l-ka\_dib-Una أَنْتُمْ الْكَاذِبُونَ 'antumū 'l-kādib<sup>ūna</sup>, ra'aytumū  
'l-rajul-a رَأَيْتُمُ الرَّجُلَ ra'aytumū 'r-raġul<sup>a</sup>, mani 'l-ka\_d\_dAb-u مَنِ  
الْكَذَّابُ mani 'l-kaddāb<sup>u</sup>, qatalati 'l-rUm-u قَتَلَتِ الرُّومَ qatalati 'r-Rūm<sup>u</sup>.

However, the Arabic script does not show the *kasrah* or the *ḍammah* which may be taken by the nouns having *tanwīn* although it is explicit in pronunciation and must appear in some transliteration standards. *arabluatex* takes care of that automatically:—

mu.hammaduN 'l-nabI مُحَمَّدُ النَّبِيِّ Muḥammad<sup>uni</sup> 'n-nabī, salAmuN ud\_hulUA  
سَلَامٌ أَدْخُلُوا salām<sup>umu</sup> 'dhulū, qa.sIdata-hu fI qatl-i \cap{'a}bI  
\cap{m}uslimiN 'llatI yaqUlu fI-hA قَتَلَ أَيُّ مُسْلِمٍ الَّتِي يَقُولُ  
قَصِيدَتُهُ فِي قَتْلِ أَبِي مُسْلِمٍ الَّتِي يَقُولُ 'llatī yaqūlu fī-hā.  
فِيهَا qaṣīdata-hu fī qatl<sup>i</sup> 'Abī Muslim<sup>ini</sup>

### 4.3 Special orthographies

**The name of God** The name of God, اللَّهُ, is compounded of the article اَلْ, and إِلَٰه (noted إِلَٰه with the defective *'alif*) so that it becomes اَلْإِلَٰه; then the *hamzah* is suppressed, its vowel being transferred to the ل before it, so that there remains اَللَّهُ (I refer to Lane, *Lexicon*, I. 83 col. 1). Finally, the first ل is made quiescent and incorporated into the other, hence the *tašdīd* above it. As *arabluatex* never requires a solar letter to be written twice (see above, on page 15), the name of God is therefore encoded al-l\_ah-u or 'l-l\_ah-u:—

al-l\_ah-u اللهُ *al-lāh<sup>u</sup>*, yA|<sup>22</sup> al-l\_ah-u اللهُ يَا *yā al-lāh<sup>u</sup>*, 'a-fa|<sup>23</sup>-al-l\_ah-i la-ta.g`alanna أَفَالله لَتَعْلَمَنَّ *'a-fa-al-lāh<sup>i</sup> la-tag'alanna*, bi-'l-l\_ah-i بالله *bi-'l-lāh<sup>i</sup>*, wa-'l-l\_ah-i والله *wa-'l-lāh<sup>i</sup>*, bi-sm-i 'l-l\_ah-i بِسْمِ اللهِ *bi-sm<sup>i</sup> 'l-lāh<sup>i</sup>*, al-.hamd-u li-l-l\_ah-i لِلّٰهِ الْحَمْدُ *al-ḥamd<sup>u</sup> li-llāh<sup>i</sup>*, li-l-l\_ah-i 'l-qA'il-u لِلّٰهِ الْقَائِلُ *li-llāh<sup>i</sup> 'l-qā'il<sup>u</sup>*.

**The conjunctive الَّذِي** Although it is compounded of the article اَلْ, the demonstrative letter ل and the demonstrative pronoun هَا, both masculine and feminine forms that are written defectively are encoded alla\_dI and allatI respectively. Forms starting with the connective 'alif are encoded 'lla\_dI and 'llatI:—

'a\_hAfu mina 'l-malik-i 'lla\_dI ya.zlimu 'l-nAs-a أَخَافُ مِنَ الْمَلِكِ *'ahāfu mina 'l-malik<sup>i</sup> 'lladī yazlimu 'n-nās<sup>a</sup>*, `udtu 'l-`say\_h-a 'lla\_dI huwa marI.duN عُدْتُ الشَّيْخَ الَّذِي هُوَ مَرِيضٌ *'udtu 'š-šayh<sup>a</sup> 'lladī huwa marīd<sup>un</sup>*, mA 'anA bi-'lla\_dI qA'iluN la-ka `say'aN مَا أَنَا بِلَدِّي قَائِلٌ لَكَ شَيْئًا *mā 'anā bi-'lladī qā'il<sup>un</sup> la-ka šay'<sup>an</sup>*.  
'ari-nA 'lla\_dayni 'a.dallA-nA mina 'l-jinn-i wa-'l-'ins-i أَرِنَا الَّذِي أَضَلَّانَا مِنَ الْجِنِّ وَالْإِنْسِ *'ari-na 'lladayni 'adallā-nā mina 'l-ḡinn<sup>i</sup> wa-'l-'ins<sup>i</sup>*.

The other forms are encoded regularly as al-l or 'l-l:—

fa-'innA na\_dkuru 'l-.sawt-ayni 'l-la\_dayni rawaynA-humA `an ja.h.zaT-a فَإِنَّا نَذْكُرُ الصَّوْتَيْنِ اللَّذَيْنِ رَوَيْنَاهُمَا عَنْ حَظَّةٍ *fa-'innā nadkuru 'š-šawt<sup>ayni</sup> 'l-ladayni rawaynā-humā `an Ḥaḥẓat<sup>a</sup>*.

And also: al-la\_dAni اللّٰذَانِ *al-ladāni*, al-la\_dayni اللّٰذَيْنِ *al-ladayni*, al-latAni اللّٰتَانِ *al-latāni*, al-latayni اللّٰتَيْنِ *al-latayni*, al-lAtI اللَّاتِي *al-lātī*, al-lA' |AtI<sup>24</sup> اللَّائِي *al-lā'ī*, al-lA' I اللَّائِي *al-lā'ī*, and so forth.

<sup>22</sup>Note the “pipe” character ‘|’ here after yA and below after fa before footnote mark 23: it is needed by the dmḡ transliteration mode as in this mode any vowel at the commencement of a word preceded by a word that ends with a vowel, either short or long, is absorbed by this vowel viz. ‘alā ‘t-ṭarīq<sup>i</sup>. See section 4.5 on page 22 on the “pipe” and section 7 on page 30 on dmḡ mode.

<sup>23</sup>See footnote 22.

<sup>24</sup>Note here the “pipe” character ‘|’: as already stated on page 15, the sequence 'A usually encodes 'alif with hamzah followed by 'alif of prolongation, which is represented in writing 'alif with maddah: ٲ. The “pipe” character prevents this rule from being applied. See section 4.5 on page 22.

## 4.4 Quoting

It is here referred to “quoting” after the `arabtex` package.<sup>25</sup> The “quoting” mechanism of `arabluatex` is designed to be very similar in effect to the one of `arabtex`.

To start with an example, suppose one types the following in `novoc` mode: علم علم الهيئة; is it عَلَّمَ, *he was taught the science of astronomy*, or عَلَّمَ, *he taught the science of astronomy*? In order to disambiguate this clause, it may be sensible to put a *ḍammah* above the first ع: عَلَّمَ علم الهيئة, which is achieved by “quoting” the vowel u, like so: `ullima, or, with no other vowel than the required u: `ullm.

This is how the “quoting” mechanism works: metaphorically speaking, it acts as a *toggle switch*. If something, in a given mode, is supposed to be visible, “quoting” hides it; conversely, if it is supposed not to, it makes it visible.

As shown above, “quoting” means inserting one straight double quote (") *before* the letter that is to be acted upon. Its effects depend on the mode which is currently selected, either `novoc`, `voc` or `fullvoc`:—

**novoc** In this mode, “quoting” essentially means make visible something that ought not to be so.

- (a) Quoting a vowel, either short or long, makes the *ḍammah*, *fathah* or *kasrah* appear above the appropriate consonant:—

`ullima `ilm-a 'l-hay'aT-i علم علم الهيئة 'ullima 'ilm<sup>a</sup> 'l-hay'at<sup>i</sup>,  
ya.gz"UA يغزوا yağzū.

- (b) The same applies when “quoting” the *tanwīn*:—

wa-'innA sawfa tudriku-nA 'l-manAyA muqadd"araT"aN وإنا سوف  
تدركنا المنيا مقدراً<sup>an</sup>, wa-'innā sawfa tudriku-na 'l-manāyā muqaddarat<sup>an</sup>.

- (c) If no vowel follows the straight double quote, then a *sukūn* is put above the preceding consonant:—

qAla isma`" قال اسمع qāla 'sma', jA'at" hinduN جَاءَتْ هِنْدُ gā'at  
Hind<sup>un</sup>, ṣabIhuN bi-man q"u.ti`at" qadamA-hu شَبِهُ بِمَنْ قُطِعَتْ qadamā-hu.  
qadamā-hu. ṣabīh<sup>un</sup> bi-man qutī'at qadamā-hu.

- (d) At the commencement of a word, the straight double quote is interpreted as *ʿalif*<sup>u</sup> 'l-waṣl<sup>i</sup>:—

wa-"ust"u`mila وأَسْتَعْمَل wa-'stu'mila, huwa "inhazama هو أَنْهَزَم huwa  
'nhazama, al-"intiqA.d-u الْإِنْتِقَاض al-intiqāḍ<sup>u</sup>.

**voc** In accordance with the general rule, in this mode, “quoting” makes the vowels and the *tanwīn* disappear, should this feature be required for some reason:—

- (a) Short and long vowels:—

<sup>25</sup>See Lagally (2004, p. 22)

q"Ala q"A'iluN قَالَ قَاتِلْ *qāla qā'il<sup>un</sup>*, ibn-u 'abI 'u.saybi`aT-"a  
 ابن أبي أصيبعة *Ibn<sup>u</sup> 'Abī 'Uṣaybi'at<sup>a</sup>*.

(b) *tanwīn*:—

madInaT"aN مَدِينَة *madīnat<sup>an</sup>*, bAb"aN بَابَا *bāb<sup>an</sup>*, hud"aN\_A هُدَى *hudā<sup>n</sup>*,  
 شَيْءٌ *šay<sup>in</sup>*.

One may more usefully “quote” the initial vowels to write the *waṣlah* above the *ʿalif* or insert a straight double quote after a consonant not followed by a vowel to make the *sukūn* appear:—

(a) *ʿalif<sup>u</sup> ʿl-waṣl<sup>i</sup>*:—

fI "istiq.sa'-iN فِي اسْتِقْصَاءٍ *'stiqṣā'<sup>in</sup>*, wa-"istiq.sa'-uN وَأَسْتِقْصَاءُ  
*wa-'stiqṣā'<sup>un</sup>*, qAla "uhrub fa-lan tuqtala قَالَا أَهْرُبْ فَلَنْ تُقْتَلَ  
*'hrub fa-lan tuqtala*.

(b) *sukūn*:—

qAla "uqtul" fa-lan tuqtala قَالَا أَقْتُلْ فَلَنْ تُقْتَلَ *'qtul fa-lan tuq-*  
*tala*, mA jA'at" mini imra'aTiN مَا جَاءَتْ مِنْ امْرَأَةٍ *mā ḡā'at mini*  
*'mra'at<sup>in</sup>*, kam" qad" ma.dat" min" laylaTiN كَمْ قَدْ مَضَتْ مِنْ لَيْلَةٍ *kam*  
*qad maḍat min laylat<sup>in</sup>*.

**fullvoc** In this mode, “quoting” may be used to take away any short vowel (or *tanwīn*, as seen above) or any *sukūn*:—

al-jamr-u 'l-.sayfiyy-u 'lla\_dI kAna bi-q"rAn" |nUn-a أَجْرُ الصَّيْفِيِّ  
 الَّذِي كَانَ يَقْرَأُونَ *al-ḡamr<sup>u</sup> 's-ṣayfiyy<sup>u</sup> 'llaḍī kāna bi-Qrānnūn<sup>a</sup>*.

#### 4.4.1 Quoting the hamzah

As said above in section 4.2 on page 13, the *hamzah* is always written ⟨'⟩, its carrier being determined by contextual analysis. “Quoting” that straight single quote character like so: ⟨"'"⟩ allows to determine the carrier of the *hamzah* freely, without any consideration for the context. Table 5 gives the equivalents for all the possible carriers the *hamzah* may take.

Letter	Transliteration <sup>26</sup>			ArabT <sub>E</sub> X notation
	dmg	loc	arabica	
ء	ʿ	ʿ	ʿ	"'
آ	ā	ā	ā	A"'
أ	ʾ	ʾ	ʾ	a"'

<sup>26</sup>See below section 7 on page 30.

Letter	Transliteration			ArabTeX notation
	dmg	loc	arabica	
أ	ﺍ	ﺍ	ﺍ	u''
و	ﻭ	ﻭ	ﻭ	w''
إ	ﺍ	ﺍ	ﺍ	i''
ي	ﻱ	ﻱ	ﻱ	y''

Table 5: “Quoted” *hamzah*

As one can see from table 5 on page 21, the carrier of the *hamzah* is inferred from the letter that precedes the straight double quote ‘`<”>`’. Of course, any “quoted” *hamzah* may take a short vowel, which is to be written *after* the ArabTeX equivalent for the *hamzah* itself, namely ‘`<’>`’. For example, `أ` is encoded `<w'''a>`, while `و` is encoded `<w''''>`. In the latter example, the second straight double quote encodes the *sukūn* in *voc* mode in accordance with the rule laid above on pages 20–21.

'a`dA'ukum أَعْدَاؤُكُمْ 'a`dA|''ukum أَعْدَاءُكُمْ 'a`dA'ikun أَعْدَائِكُمْ  
'a`dA|''ikun أَعْدَاءُكُمْ 'a`dA'ikun أَعْدَائِكُمْ.

## 4.5 The “pipe” character (|)

In the terminology of ArabTeX, the “pipe” character ‘`|`’ is referred to as the “invisible consonant”. Hence, as already seen above in section 4.4.1 on page 21, its usage to encode the *hamzah* alone, with no carrier: `|''` ء.

Aside from that usage, the “pipe” character is used to prevent almost any of the contextual analysis rules that are described above from being applied. Two examples have already been given to demonstrate how that particular mechanism works in footnote 22 on page 19 and in footnote 24 on page 19. One more example follows:—

bi-qraAn|nUn-a بِقْرَانُونْ<sup>27</sup> *bi-Qrānnūn*<sup>a</sup>, “in Crannon” (Thessaly, Greece).<sup>27</sup>

As one can see, the “pipe” character between the two `<n>` prevents the necessary *tašdīd* rule (page 15) from being applied.

## 4.6 Putting back on broken contextual analysis rules

In complex documents such as critical editions where footnotes and other kind of annotations can be particularly abundant, the contextual analysis rules that are described above may be broken by L<sup>A</sup>T<sub>E</sub>X commands. To take an example, consider the following:—

<sup>27</sup>See more context on page 21.

```

1 This is wrong:
2 \begin{arab}[fullvoc]
3   fa-lamma ra'aW\LRfootnote{A footnote that interferes with the
4     contextual analysis.} 'l-na^gma...
5 \end{arab}

```

This is wrong:

فَلَمَّا رَأَوْا<sup>a</sup> النَّجْمَ...

---

<sup>a</sup> A footnote that interferes with the contextual analysis.

According to the rule stated on page 18, the diphthong in *ra'aw* must be resolved into two simple vowels before the *'alif*<sup>u</sup> *'l-wasl*<sup>i</sup>, as رَأَوْا النَّجْمَ.

`\arbnnull` The `\arbnnull` command is provided so as to put back on contextual analysis rules in such situations. It takes as argument the word that must be brought back for any given rule to be applied as it ought to. Depending on the contexts that have to be restored, `\arbnnull` may be found just after or before Arabic words.

In any case, *no space must be left* after or before the Arabic word that `\arbnnull` is applied to.

The following shows how the Arabic should have been written in the preceding example and gives further illustrations of the same technique:—

```

1 \begin{arab}[fullvoc]
2   fa-lamma ra'aW\arbnnull{'l-na^gma}\LRfootnote{A footnote that
3     interferes with the contextual analysis.} 'l-na^gma...
4
5   qAla\LRfootnote{A footnote that interferes with the contextual
6     analysis.} \arbnnull{qAla}uhrub fa-lan tuqtala.
7
8   \cap{z}aydu\arbnnull{ibnu}\LRfootnote{A footnote that interferes
9     with the contextual analysis.} \arbnnull{zaydu}ibn-u
10  \cap{`a}mriNU.\LRfootnote{See \vref{fn:zayd-is-son}.}
11 \end{arab}
12 \begin{arab}[trans]
13   \cap{z}aydu\arbnnull{ibnu}\LRfootnote{A footnote that interferes
14     with the contextual analysis.} \arbnnull{zaydu}ibn-u
15   \cap{`a}mriNU.\LRfootnote{See \vref{fn:zayd-is-son}.}
16 \end{arab}

```

فَلَمَّا رَأَوْا<sup>a</sup> النَّجْمَ...  
قَالَ<sup>b</sup> أَهْرُبُ فَلَنْ تُقْتَلَ.

*Zayd<sup>un</sup>ie 'bn<sup>u</sup> 'Amr<sup>in</sup>f*

زَيْدٌ<sup>d</sup> ابْنُ<sup>c</sup> عَمْرٍو<sup>e</sup>

- <sup>a</sup>A footnote that interferes with the contextual analysis.  
<sup>b</sup>A footnote that interferes with the contextual analysis.  
<sup>c</sup>A footnote that interferes with the contextual analysis.  
<sup>d</sup>See footnote 20 on page 17.  
<sup>e</sup>A footnote that interferes with the contextual analysis.  
<sup>f</sup>See footnote 20 on page 17.

## 4.7 Stretching characters: the taṭwīl

A double hyphen <- -> stretches the ligature in which one letter is bound to another. Although it is always better to rely on automatic stretching, this technique may be used to a modest extent, especially to increase legibility of letters and diacritics which stand one above the other:—

.hunayn-u bn-u 'is.h--\_aq-a حُنَيْنٌ بْنُ إِسْحَاقَ *Hunayn<sup>u</sup> bn<sup>u</sup> 'Ishāq<sup>a</sup>*

## 4.8 Digits

### 4.8.1 Numerical figures

The *Indian numbers*, *ar-raqam<sup>u</sup> 'l-hindiyy<sup>u</sup>*, are ten in number, and they are compounded in exactly the same way as our numerals:—

1874 ١٨٧٤, 123-456,789 ١٢٣-٤٥٦,٧٨٩, fI sanaT-i 1024 ١٠٢٤ فِي سَنَةِ ١٠٢٤

### 4.8.2 The abjad

The numbers may also be expressed with letters from right to left arranged in accordance with the order of the Hebrew and Aramaic alphabets (see Wright 1896, i. 28 B–C). The *abjad* numbers are usually distinguished from the surrounding words by a stroke placed over them.

`\abjad` *abjad* numbers are inserted with the `\abjad{<number>}` command in any of the `voc`, `fullvoc` and `novoc` modes, where <number> may be any number between 1 and 1999, like so:—

`\abjad{45}` kitAbu-hu fI 'l-`AdAt-i مَكْتُوبُهُ فِي الْعَادَاتِ 45 *kitābu-hu fi 'l-`ādāt<sup>i</sup>*.

REM. *a*. As can be seen in the above given example, `arabluatex` expresses the *abjad* numbers in Roman numerals if it finds the `\abjad` command in any of the transliteration modes.

REM. *b*. `\abjad` may also be found outside Arabic environments. In that case, `arabluatex` does not print the stroke as a distinctive mark over the number for it is not surrounded by other Arabic words. In case one nonetheless wishes to print the stroke, he can use the `\aemph` command that is described below in section 4.10 on the following page:—



The `\arb[trans]{'abjad}` number for 1874 is `\abjad{1874}` The *ʿabjad* number for 1874 is غَضْعَد.

The `\arb[trans]{'abjad}` number for 1874 is `\aemph{\abjad{1874}}` The *ʿabjad* number for 1874 is غَضْعَد.

## 4.9 Additional characters

In the manuscripts, the unpointed letters, *al-ḥurūfu ʿl-muhmalatu*, are sometimes further distinguished from the pointed by various contrivances, as explained in Wright (1896, i. 4 B–C). One may find these letters written in a smaller size below the line, or with a dot or another mark below. As representing all the possible contrivances leads to much complexity and also needs to be agreed among scholars, new ways of encoding them will be proposed and gradually included as `arabluatex` will mature.

For the time being, the following is included:—

Letter	Transliteration <sup>28</sup>			ArabT <sub>E</sub> X notation
	dmg	loc	arabica	
ب	<i>ḅ</i>	<i>b</i>	<i>b</i>	.b
د	<i>ḍ</i>	<i>d</i>	<i>d</i>	˘d
ف	<i>f̣</i>	<i>f</i>	<i>f</i>	.f
ق	<i>q̣</i>	<i>q</i>	<i>q</i>	.q
ك	<i>ḳ</i>	<i>k</i>	<i>k</i>	.k
ن	<i>ṇ</i>	<i>n</i>	<i>n</i>	.n
ⵍ	(	(	(	((
ⵍ	)	)	)	))

Table 6: Additional Arabic codings

'afAman.tUs Gal.(M) .fmn.n.ts (sic) Gal.(E1), أفامنطوس Gal.(M) مُنطس (sic) Gal.(E1), 'afāmanṭūs Gal.(M) *fmnṭs* (sic) Gal.(E1).

## 4.10 Arabic emphasis

As already seen in section 4.8.2 on page 24, the *ʿabjad* numbers are distinguished from the surrounding words by a stroke placed over them. This technique is used to distinguish further words that are proper names or book titles.

`\aemph` One may use the `\aemph{⟨Arabic text⟩}` command to use the same technique to emphasize words, like so:—

`\abjad{45}: kitAbu-hu \aemph{fI 'l-`AdAt-i}` 45: مة: كِتَابُهُ فِي الْعَادَاتِ  
*kitābu-hu fi ʿl-Ādāt<sup>i</sup>*.

<sup>28</sup>See below section 7 on page 30.

New feature  
v1.6

## 5 Arabic poetry

arabluatex provides a special environment for typesetting Arabic poetry. Every line in this environment must end with `\`.

**arabverse** The `arabverse` environment may take up to six optional ‘named arguments’ each of which is set using the syntax `<key>=<value>`, like so:—

```
1 \begin{arabverse}[key1=value1, key2=value2, ...]
2   <verses>
3 \end{arabverse}
```

The description of the optional arguments follows:—

**mode** `mode=<mode>`, either `voc`, `fullvoc`, `novoc` or `trans`. The default mode is the one that is set at load time as already seen section 2.2 on page 5.

**width** `width=<length>` Default: 0.3\linewidth  
The default width of each hemistich that the verse consists of. It may be expressed in any accepted unit of measurement, such as 4cm or 2in. However, one must keep in mind that the total length of the two hemistichs added to the one of the gutter that separates them must not exceed the length of the base line, unless one wishes to have the hemistichs distributed on subsequent lines.

**gutter** `gutter=<width>` Default: 0.15 x (hemistich width)  
The gutter consists of the blank space that is between the two hemistichs. By default, it is commensurate with the width of the hemistich, but it may be expressed in any accepted unit of measurement as well.

**metre** `metre=<name>` Default: none  
If the name of the metre is expressed, it is printed after the lines and set flush left in `voc`, `fullvoc` and `novoc` modes or flush right in `trans` mode.

**delim** `delim=true|false` Default: false  
This named argument does not need a value as it defaults to `true` if it is used. If so, a delimiter is printed between each of the hemistichs. By default, it is set to the ‘star’ character ‘\*’. The `\SetHemistichDelim{<delimiter>}` command may be used at any point of the document to change this default setting.

`\SetHemistichDelim`

**utf** `utf=true|false` Default: false  
As the preceding one, this named argument does not need a value as it defaults to `true` if it is used. If so, unicode Arabic input is expected in the `arabverse` environment instead of ASCII ArabTeX or Buckwalter input schemes. See section 9 on page 37 for more details.

**\bayt** Inside the `arabverse` environment, each line is typeset by the `\bayt` command which takes two mandatory arguments and may accept one optional argument. Additionally, every `\bayt` command *must* be followed with `\` like so:—

```
\bayt{<šadr>}[<tadwīr>] {<ağuz>}\
```

That two subsequent hemistichs should be connected with one another is technically named *tadwīr*. Should that happen, either the *ṣadr* or the *ʿağuz* or both of them, may be connected to one another by letters that are naturally bound to the following or the preceding ones over the *tadwīr*. The optional argument of the `\bayt` command is designed to deal with the various situations that may arise:—

- (a) If the two hemistichs be connected with one another by a prominent horizontal flexible stroke, the *taṭwīl* should be used, like so: `[--]` (see section 4.7 on page 24). Of course, the ending word of the *ṣadr* and the word at the commencement of the *ʿağuz* must have the *taṭwīl* too so that the proper shapes of the letters be selected. Consider for example the following:—

```
1 \begin{arabverse}[mode=fullvoc, width=.3\linewidth]
2 \bayt{[LA 'ar_A man `ahidtu fI-hA fa-'abkI 'l---]{---yawma
3 dalhaN wa-mA yaruddu 'l-bukA'u}\
4 \end{arabverse}
```

لَا أَرَى مَنْ عَهِدَتْ فِيهَا فَأَبْكِي الْيَوْمَ دَهْلًا وَمَا يَرُدُّ الْبُكَاءُ

As one can see, *triple hyphens* have been used. In the *ṣadr*, the first hyphen triggers the rules that are related to the definite article and the *ʿalif<sup>u</sup>* *ʿl-waṣl<sup>i</sup>*,<sup>29</sup> while the following two select the figure of the letter *lām* connected with a following letter. In the *ʿağuz*, the last two hyphens select the letter *yā* connected with a preceding letter, while the first one is simply discarded in this mode, but still may appear as it should, if the *trans* mode be selected:—

```
1 \begin{arabverse}[mode=trans, width=.4\linewidth]
2 \bayt{[LA 'ar_A man `ahidtu fI-hA fa-'abkI 'l---]{--}{---yawma
3 dalhaN wa-mA yaruddu 'l-bukA'u}\
4 \end{arabverse}
```

*lā* 'arā man 'ahidtu fī-hā fa-'abki 'l- -yawma dalh<sup>am</sup> wa-mā yaruddu 'l-bukā'u

- (b) In some other cases, it may seem difficult, if not fairly impossible, to split a given word into two parts. This happens mostly because of the *šaddah*. Consider for example the following:—

```
1 \begin{arabverse}[mode=fullvoc, width=.25\linewidth, gutter=1cm]
2 \bayt{.gayra 'annI qad 'asta`Inu `al_A 'l-ha--}{--mmi }{'i_dA
3 _haffa bi-'l-_tawiyyi 'l-na`gA'u}\
4 \bayt{bi-zaf--UfiN ka-'anna-hA hiq--laTuN}[ 'ummu ]{'ri'Alin
5 dawwiyyaTuN saqfA'u}\
6 \end{arabverse}
```

<sup>29</sup>See section 4.2 on page 16

غَيْرَ أَنِّي قَدْ اسْتَعِينُ عَلَى الْهَمِّ      إِذَا خَفَّ بِالثَّوِيِّ النَّجَاءُ  
بِرَفُوفٍ كَانَتْهَا هِقْلَةٌ أُمُّ      رِثَالٍ دَوِيَّةٌ سَقَفَاءُ

In the first line, the word `الْهَمِّ` should be split into `الْهَمِّ` as the first part of it belongs to the *ṣadr* and the second to the *ʿağuz*. One solution to avoid splitting this word in such a way is to write inside the *tadwīr* the part of it that belongs to either hemistich, without omitting to add a space after it. In the second line, the word `أُمُّ` should be split into `أُمُّ`, so that the only way to avoid splitting it into two parts is to write it all inside the *tadwīr*. In that case, as the word is to be placed in the middle, it has been surrounded by spaces.

**Scaling and distortion of characters** The `arabverse` environment and the `\bayt` command are designed to typeset the verses in a two-column, fixed width layout. This may result in a somewhat distorted text. Should that happen, one may adapt the layout by modifying the values of the above described `width` and `gutter` named arguments until the visual aspect of the layout be satisfactory. It has to be noted that distortion and warping may be even more perceptible in Roman than in Arabic characters.

**Footnotes** Footnotes are not set by default inside the `\bayt` command, but there are two easy ways to have them printed.

If they are little in number, each footnote may be split into pairs of `\footnote mark{}` (please mind the braces) in the argument of the `\bayt` command and `\footnotetext` outside the `\bayt` command.

If the footnotes are abundant in number, it is advised to load the `footnotehyper` package which `arabluatex` will then use to typeset any kind of footnote that is called from the arguments of the `\bayt` command.<sup>30</sup>

**Line numbering** Inside the `arabverse` environment, the `linenumbers` environment of the `lineno` package may be used to have the lines of succeeding verses numbered. Please refer to the documentation of this package for more information or to the example below for a basic implementation of this technique.

<sup>30</sup>The `footnote` package may also be used for the same effect. However, it must be loaded *after* `arabluatex`.

## 5.1 Example

Here follow the first lines of Imru'u 'l-Qaysi's *Mu'allaqah*. In this example, `\SetArbDflt*` has been selected so as to mark the *idgām* that is fit to this declamatory poetry:—<sup>31</sup>

```

1 \begin{arab}[fullvoc]
2   qAla \cap{i}mru'u 'l-\cap{q}aysi fI mu`allaqati-hi:
3 \end{arab}
4
5 \begin{arabverse}[mode=fullvoc, metre={(al-.darbu 'l-_tAnI mina
6   'l-`arU.di 'l-'_Ul_A mina 'l-.tawIli)}]
7   \SetArbDflt*
8   \begin{linenumbers*}
9     \bayt{qifA nabki min _dikr_A .habIbiN wa-manzili}{bi-saq.ti
10      'l-liw_A bayna \cap{'l-d}a_hUli fa-\cap{.h}awmali}\\
11     \bayt{fa-\cap{t}U.di.ha fa-'l-\cap{m}iqrATi lam ya`fu
12      rasmu-hA}{limA nasa^gat-hA min ^ganUbiN wa-^sam'ali}\\
13     \bayt{tar_A ba`ara 'l-'ar'Ami fI `ara.sAti-hA}{wa-qI`Ani-hA
14      ka-'anna-hu .habbu fulfuli}\\
15     \bayt{ka-'annI .gadATa 'l-bayni yawma ta.hammalUA}{lad_A
16      samurAti 'l-.hayyi nAqifu .han.zali}\\
17     \bayt{wuqUfaN bi-hA .sa.hbI `alayya ma.tiyya-hum}{yaqUlUna lA
18      tahlik 'asaN_A wa-ta^gammali}\\
19     \bayt{wa-'inna ^sifA'I `abraTuN muharAqaTuN}{fa-hal `inda rasmiN
20      dAsiriN min mu`awwali}\\
21   \end{linenumbers*}
22 \end{arabverse}

```

قَالَ أَمْرُؤُ الْقَيْسِ فِي مَعْلَقَتِهِ:

1	بَسَقَطِ اللَّوَى بَيْنَ الدَّخُولِ لِحَوْمِلِ	فَنَا نَبَكٍ مِنْ ذِكْرَى حَبِيبٍ وَمَنْزِلِ
2	لَمَّا نَسَجْتَهَا مِنْ جَنُوبٍ وَشَمَالِ	فَتَوَضَّعَ فَاَلْمَقْرَأَةُ لَمْ يَعْفُ رَسْمُهَا
3	وَقِيَعَانَهَا كَأَنَّهُ حَبٌّ فَلَقْلِقِ	تَرَى بَعَرَ الْأَرَامِ فِي عَرَصَاتِهَا
4	لَدَى سَمَرَاتِ الْحَيِّ نَاقِفٌ حَنْظَلِ	كَأَنِّي غَدَاةَ الْبَيْنِ يَوْمَ تَحْمَلُوا
5	يَقُولُونَ لَا تَهْلِكِ أَسَى وَتَجْمَلِ	وَقُوفًا بِهَا صَحْبِي عَلَيَّ مَطِئِهِمْ
6	فَهَلْ عِنْدَ رَسْمٍ دَاسِرٍ مِنْ مُعَوِّلِ	وَأَنَّ شِفَايَ عِبْرَةَ مَهْرَاقَةٍ

(الضَرْبُ الثَّانِي مِنَ الْعُرُوضِ الْأُولَى مِنَ الطَّوِيلِ)

qāla Imru'u 'l-Qaysi fī mu'allaqati-hi:

<sup>31</sup> Please note that for the time being only the assimilation rules that are laid on item **b** on page 16 are applied. See section 2.2.1 on page 6 for more information. None of the editions of the *Mu'allaqāt* that I know of feature the *idgām* in the Arabic text, although it is often strongly marked in declamation.

1	<i>qifā nabki min dīkrā ḥabīb<sup>iw</sup> wa-manzili</i>	<i>bi-saqṭi 'l-livā bayna 'd-Daḥūli fa-Ḥawmali</i>
2	<i>fa-Tūḍiḥa fa-'l-Migrāti lam ya'fu rasmu-hā</i>	<i>limā nasaḡat-hā min ḡanūb<sup>iw</sup> wa-šam'ali</i>
3	<i>tarā ba'ara 'l-'ar'āmi fi 'araṣāti-hā</i>	<i>wa-qī'āni-hā ka-'anna-hu ḥabbu fulfuli</i>
4	<i>ka-'annī ḡadāta 'l-bayni yawma taḥammalū</i>	<i>ladā samurāti 'l-ḥayyi nāqifu ḥanzali</i>
5	<i>wuqūf<sup>an</sup> bi-hā ṣaḥbī 'alayya maṭiyya-hum</i>	<i>yaqūlūna lā tahlīk 'aṣa<sup>w</sup> wa-taḡammali</i>
6	<i>wa-'inna šifā'ī 'abrat<sup>um</sup> muḥarāḡat<sup>un</sup></i>	<i>fa-hal 'inda rasm<sup>in</sup> dāsir<sup>im</sup> mim mu'awwali</i>
	<i>(aḡ-ḡarbu 't-tānī minā 'l-'arūḡi 'l-'ulā minā 't-tawīli)</i>	

## 6 Special applications

**Linguistics** The same horizontal stroke as the *taṭwīl* (see section 4.7 on page 24) may be encoded  $\langle B \rangle$ ;  $\langle BB \rangle$  will receive the *tašdīd*. This is useful to make linguistic annotations and comments on vowels:—

Bu Ba Bi BuN BaN BiN  $\overset{\text{u}}{\text{u}} \overset{\text{a}}{\text{a}} \overset{\text{i}}{\text{i}} \overset{\text{un}}{\text{un}} \overset{\text{an}}{\text{an}} \overset{\text{in}}{\text{in}}$ , BBu BBa BBi  $\overset{\text{u}}{\text{u}} \overset{\text{a}}{\text{a}} \overset{\text{i}}{\text{i}}$ , B--aN  
 ُ -<sup>an</sup>, B" .

New feature  
v1.4.3

**Brackets** The various bracket symbols are useful in technical documents such as critical editions for indicating that some words or some letters must be added or removed. *arabluatex* will automatically fit those symbols to the direction of the text. For the time being, the following symbols are supported:

- parentheses:  $()$
- square brackets:  $[]$
- angle brackets:  $\langle \rangle$
- braces:  $\{ \}$

$\backslash$ abraces      Parentheses, square and angle brackets may be input directly at the keyboard; however, words or letters that are to be read between braces must be passed as arguments to the  $\backslash$ abraces command:—

```

1 \begin{arab}
2   \abraces{wa-qAla} 'inna 'abI kAna minā 'l-muqAtilaTi
3   wa-kAna--<--t> 'ummI min `u.zamA'i buyŪti 'l-zamAzimaTi.
4 \end{arab}
```

{وَقَالَ} إِنَّ أَبِي كَانَ مِنَ الْمُقَاتِلَةِ وَكَانَتْ أُمِّي مِنْ عُظَمَاءِ بُيُوتِ الزَّمَاةِ.

## 7 Transliteration

It may be more appropriate to speak of “romanization” than “transliteration” of Arabic. As seen above in section 2.2 on pages 5–8, the “transliteration mode” may be selected globally or locally.

New feature  
v1.8

This mode transliterates the ArabTeX input into one of the accepted standards. As said above on page 5, three standards are supported at present:

**dmg** *Deutsche Morgenländische Gesellschaft*, which was adopted by the International Convention of Orientalist Scholars in Rome in 1935.<sup>32</sup> dmg transliteration convention is selected by default;

**loc** *Library of Congress*: this standard is part of a large set of standards for romanization of non-roman scripts adopted by the American Library Association and the Library of Congress;<sup>33</sup>

**arabica** *Journal of Arabic and Islamic Studies/Revue d'études arabes et islamiques*: this standard is most widely used by scholars in the field of Arabic studies.<sup>34</sup>

More standards will be included in future releases of arabluatex.

`\SetTranslitConvention`

**Convention** The transliteration mode, which is set to `dmg` by default, may be changed at any point of the document by the `\SetTranslitConvention{<mode>}` command, where `<mode>` may be either `dmg`, `loc` or `arabica`. This command is also accepted in the preamble should one wish to set the transliteration mode globally, eg.:—

```
1 \usepackage{arabluatex}
2 \SetTranslitConvention{loc}
```

`\SetTranslitStyle`

**Style** Any transliterated Arabic text is printed in italics by default. This also can be changed either globally in the preamble or locally at any point of the document by the `\SetTranslitStyle{<style>}` command, where `<style>` may be any font shape selection command, eg. `\upshape`, `\itshape`, `\slshape`, and so forth.

New feature  
v1.4

`\SetTranslitFont`

**Font** `\SetTranslitFont{<font selection command>}` allows any specific font to be selected for rendering transliterated text with the font-selecting commands of the `fontspec` or `luaotfload` package. Of course, this font must have been defined properly. To take one example, here is how the *Gentium Plus* font may be used for rendering transliterated text:—

```
1 \newfontfamily\translitfont{Gentium Plus}[Ligatures=TeX]
2 \SetTranslitFont{\translitfont}
```

`\cap` **Proper names** Proper names or book titles that must have their first letters up-

<sup>32</sup>See Brockelmann et al. (1935).

<sup>33</sup>See <http://www.loc.gov/catdir/cpso/roman.html> for the source document concerning Arabic language.

<sup>34</sup>See [http://www.brill.nl/files/brill.nl/specific/authors\\_instructions/ARAB.pdf](http://www.brill.nl/files/brill.nl/specific/authors_instructions/ARAB.pdf).

percased may be passed as arguments to the `\cap{⟨word⟩}` command. `\cap` is a clever command, for it will give the definite article *al-* in lower case in all positions. Moreover, if the initial letter, apart from the article, cannot be uppercased, viz. ‘ or ‘, the letter next to it will be uppercased:—

`\cap{.hunayn-u} bn-u \cap{'is.h-aq-a} حُنَيْنُ بْنُ إِسْحَقَ Hunaynu bnu`  
`'Ishāqa, \cap{'u_tm_an-u} عُثْمَنُ Uṭmānu, .daraba \cap{zayd-u} bn-`  
`u \cap{_h_alidiN} \cap{sa`d-a} bn-a \cap{'awf-i} bn-i \cap{``  
``abd-i} \cap{'l-l_ah-i} عَلِيٌّ بْنُ عَبْدِ اللَّهِ daraba`  
`Zaydu bnu Ḥālidin Sa`da bna Awfi bni Abdi 'l-Lāhi.`

However, `\cap` must be used cautiously in some very particular cases, for the closing brace of its argument may prevent a rule from being applied. To take an example, as seen above on page 18, the transliteration of مُحَمَّدٌ النَّبِيُّ must be *Muḥammad<sup>uni</sup> 'n-nabī*, as nouns having the *tanwīn* take a *kasrah* in pronunciation before ‘*alifu* ‘*l-waṣli*. In that case, encoding مُحَمَّد like so: `\cap{mu.hammaduN}` is wrong, because the closing brace would prevent `arabluatex` from detecting the sequence `⟨-uN⟩` immediately followed by `⟨'-l⟩`. Fortunately, this can be circumvented in a straightforward way by inserting only part of the noun in the argument of `\cap` vz. up to the first letter that is to be uppercased, like so: `\cap{m}u.hammaduN`.

**Hyphenation** In case transliterated Arabic words break the T<sub>E</sub>X hyphenation algorithm, one may use the `\-` command to insert discretionary hyphens. This command will be discarded in all of the Arabic modes of `arabluatex`, but will be processed by any of the transliteration modes:—

`\cap{'abU} \cap{bakriN} \cap{mu\-.ham\--madu} bnu \cap{za\--ka`  
`\-riy\--yA'a} \cap{'l-rAzI} أَبُو بَكْرٍ مُحَمَّدُ بْنُ زَكْرِيَّا الرَّازِي Abū Bakrin Mu-`  
`hammadu bnu Zakariyyāa 'r-Rāzī.`

## 7.1 Additional note on dṃg convention

According to Brockelmann et al. (1935, p. 6), Arabic ‘*rāb* may be rendered into *dṃg* in three different ways:

- (a) In full: *Amrun*;
- (b) As superscript text: *Amr<sup>un</sup>*;
- (c) Discarded: *Amr*.

`\arbup` By default, `arabluatex` applies rule **b**. Once delimited by a set of Lua functions, ‘*rāb* is passed as an argument on to a `\arbup` command which is set to `\textsuperscript`.

`\NoArbUp` `\NoArbUp` may be used either in the preamble or at any point of the document in case one wishes to apply rule **a**. The default rule **b** can be set back with `\ArbUpDflt` at any point of the document.

`\SetArbUp` Finally, `\SetArbUp{⟨formatting directives⟩}` may be used to customize the way



*īrāb* is displayed. To take one example, here is how Arabic *īrāb* may be rendered as subscript text:—

```
1 \SetArbUp{\textsubscript{#1}}
2 Arabic |dmg| transliteration for \arb{ra'aytu ḡami`aN
3 muhaddamaTaN mi'_danatu-hu}: \arb[trans]{ra'aytu
4 ḡami`aN muhaddamaTaN mi'_danatu-hu.}
```

Arabic dmg transliteration for رَأَيْتُ جَامِعًا مَهْدَمَةً مِثْلَهُ: *ra'aytu ḡami`an muhaddamat<sub>an</sub> mi'danatu-hu*.

As shown in the above example, #1 is the token that is replaced with the actual *tanwīn* in the formatting directives of the `\SetArbUp` command.

**īrāb boundaries** Every declinable noun (*mu'rab*) may be declined either with or without *tanwīn*, viz. *munṣarif<sup>un</sup>* or *gayr<sup>u</sup> munṣarif<sup>in</sup>*. The former is automatically parsed by *arabluatex*, whereas the latter has to be delimited with an hyphen, like so:—

**munṣarif:** mu`allimuN مَعْلِمٌ *mu'allim<sup>un</sup>*, kA'inuN كَائِنٌ *kā'in<sup>un</sup>*, kA'inAtuN كَائِنَاتٌ *kā'in<sup>ātun</sup>*, \cap{`amraNU} عَمَرُوا *Amr<sup>an</sup>*, fataN\_A فَتَى *fata<sup>n</sup>*, qA.diNI قَاضٍ *qāḍi<sup>n</sup>*.

**gayr munṣarif:** al-mu`allim-u المَعْلِمُ *al-mu'allim<sup>u</sup>*, kitAb-Ani كِتَابَانِ *kitāb<sup>āni</sup>*, ra`sa'-Ani رِشَانٍ *raša'<sup>āni</sup>*, sAriq-Una سَارِقُونَ *sāriq<sup>āna</sup>*, qA.d-Una قَاضُونَ *qāḍ<sup>āna</sup>*, al-.zulm-Atu الظُّلُمَاتُ *aẓ-ẓulm<sup>ātu</sup>*.

REM. a. As the *tanwīn* is passed over in pronunciation when it is followed by the letters ر, ل, ي, و, م, (see item **b** on page 16), it may be desirable to further distinguish it by putting it above the line, but not to do the same for *gayr munṣarif* terminations. This can be achieved by simply omitting the hyphen before any *gayr munṣarif* termination:—

kAna .ganiyyaN l\_akinna-hu labisa ḡubbaTaN mumazzaqaN 'aydu-hA كَانَ غَنِيًّا لِكِنَّةٍ لَيْسَ جِبَّةً مَزَقًا *kāna ḡaniyy<sup>an</sup> lākinna-hu labisa ḡubbat<sup>an</sup> mumazzaq<sup>an</sup> 'aydu-hā*.

REM. b. Although the hyphen before the *tanwīn* is optional as *arabluatex* always parses nouns with such termination, it may also be used to mark better the inflectional endings:—

mana`a 'l-nAs-a kAffaT-aN min mu\_hA.tabati-hi 'a.had-uN bi-sayyidi-nA مَنَّ النَّاسُ كُلُّهُ مِنْ مَنَاحِطِ أَحَدٍ بِسَيِّدِنَا *mana'a 'n-nās<sup>a</sup> kāffat<sup>an</sup> min muḥāṭabati-hi 'aḥad<sup>un</sup> bi-sayyidi-nā*.

## 7.2 Examples

Here follows in transliteration the story of *Ḡuḥā* and his donkey (جُحَا وَحِمَارُهُ). See the code on page 8:—

**‘dmg’ standard:** *atā ṣadīq<sup>un</sup> ilā Ġuḥā yaṭlubu min-hu ḥimāra-hu li-yarkaba-hu fī safrat<sup>in</sup> qaṣīrat<sup>in</sup> fa-qāla la-hu:* “sawfa u’idu-hu ilay-ka fī l-masā’i wa-adfa’u la-ka uḡrat<sup>an</sup>.” *fa-qāla Ġuḥā:* “anā āsīf<sup>un</sup> ḡidd<sup>an</sup> annī lā astatī’u an uḥaqqiqa la-ka raġbata-ka fa-l-ḥimār<sup>u</sup> laysa huna l-yawm<sup>a</sup>.” wa-qabla an yutimma Ġuḥā kalāma-hu bada’a l-ḥimār<sup>u</sup> yanhaqu fī iṣṭabli-hi. *fa-qāla la-hu ṣadīqu-hu:* “innī asma’u ḥimāra-ka yā Ġuḥā yanhaqu.” *fa-qāla la-hu Ġuḥā:* “ġarīb<sup>un</sup> amru-ka yā ṣadīqī a-tuṣaddiqu l-ḥimār<sup>a</sup> wa-tukaddība-nī?”

**‘loc’ standard:** *atā ṣadīqun ilā Juḥā yaṭlubu min-hu ḥimāra-hu li-yarkaba-hu fī safratin qaṣīratin fa-qāla la-hu:* “sawfa u’idu-hu ilay-ka fī al-masā’i wa-adfa’u la-ka ujratan.” *fa-qāla Juḥā:* “anā āsīfun jiddan annī lā astatī’u an uḥaqqiqa la-ka raġbata-ka fa-al-ḥimāru laysa hunā al-yawma.” wa-qabla an yutimma Juḥā kalāma-hu bada’a al-ḥimāru yanhaqu fī iṣṭabli-hi. *fa-qāla la-hu ṣadīqu-hu:* “innī asma’u ḥimāra-ka yā Juḥā yanhaqu.” *fa-qāla la-hu Juḥā:* “ġharībun amru-ka yā ṣadīqī a-tuṣaddiqu al-ḥimāra wa-tukadhdhiba-nī?”

**‘arabica’ standard:** *atā ṣadīqun ilā Ġuḥā yaṭlubu min-hu ḥimāra-hu li-yarkaba-hu fī safratin qaṣīratin fa-qāla la-hu:* “sawfa u’idu-hu ilay-ka fī l-masā’i wa-adfa’u la-ka uḡratan.” *fa-qāla Ġuḥā:* “anā āsīfun ḡiddan annī lā astatī’u an uḥaqqiqa la-ka raġbata-ka fa-l-ḥimāru laysa hunā l-yawma.” wa-qabla an yutimma Ġuḥā kalāma-hu bada’a l-ḥimāru yanhaqu fī iṣṭabli-hi. *fa-qāla la-hu ṣadīqu-hu:* “innī asma’u ḥimāra-ka yā Ġuḥā yanhaqu.” *fa-qāla la-hu Ġuḥā:* “ġarībun amru-ka yā ṣadīqī a-tuṣaddiqu l-ḥimāra wa-tukaddība-nī?”

## 8 Buckwalter input scheme

Even though arabluatex is primarily designed to process the ArabTeX notation, it can also process the Buckwalter input scheme to a large extent.<sup>35</sup> The Buckwalter scheme is actually processed in two steps, as it is first converted into ArabTeX. Then, once this is accomplished, the ArabTeX scheme is processed through the above described functions. In this way, the Buckwalter input scheme can make the most of the arabluatex special features that are presented in section 2.2 on page 5.

The input scheme, which is set to `arabtex` by default, may be changed at any point of the document by the `\SetInputScheme{<scheme>}` command, where `<scheme>` may be either `arabtex` or `buckwalter`. This command is also accepted in the preamble should one wish to set the input scheme globally, like so:—

```
1 \usepackage{arabluatex}
2 \SetInputScheme{buckwalter}
```

<sup>35</sup>See <http://www.qamus.org/transliteration.htm>

**‘base’, ‘xml’ and ‘safe’ schemes** `arabluatex` can use any of the so-called Buckwalter ‘base’, ‘xml’ or ‘safe’ schemes as they are described in Habash (2010, pp. 25–26).<sup>36</sup> However, the following limitation apply to the ‘base’ and ‘xml’ schemes: the braces { and }, which are used to encode ا and ئ, must be replaced with square brackets viz. [ and ] respectively.

It is therefore recommended to use the Buckwalter ‘safe’ scheme.

Table 7 gives the Buckwalter equivalents that are currently used by `arabluatex`. The additional characters that are defined in table 6 on page 25 are also available.

Letter	Transliteration <sup>37</sup>			Buckwalter notation	
	dmg	loc	arabica	base/xml	safe
ا	<i>a</i>	<i>a</i>	<i>a</i>	A	A
ب	<i>b</i>	<i>b</i>	<i>b</i>	b	b
ت	<i>t</i>	<i>t</i>	<i>t</i>	t	t
ث	<i>ṭ</i>	<i>th</i>	<i>ṭ</i>	v	v
ج	<i>ǧ</i>	<i>j</i>	<i>ǧ</i>	j	j
ح	<i>h</i>	<i>h</i>	<i>h</i>	H	H
خ	<i>ḫ</i>	<i>kh</i>	<i>ḫ</i>	x	x
د	<i>d</i>	<i>d</i>	<i>d</i>	d	d
ذ	<i>ḍ</i>	<i>dh</i>	<i>ḍ</i>	*	V
ر	<i>r</i>	<i>r</i>	<i>r</i>	r	r
ز	<i>z</i>	<i>z</i>	<i>z</i>	z	z
س	<i>s</i>	<i>s</i>	<i>s</i>	s	s
ش	<i>š</i>	<i>sh</i>	<i>š</i>	\$	c
ص	<i>ṣ</i>	<i>ṣ</i>	<i>ṣ</i>	S	S
ض	<i>ḍ</i>	<i>ḍ</i>	<i>ḍ</i>	D	D
ط	<i>ṭ</i>	<i>ṭ</i>	<i>ṭ</i>	T	T
ظ	<i>ẓ</i>	<i>ẓ</i>	<i>ẓ</i>	Z	Z
ع	<i>ʿ</i>	<i>ʿ</i>	<i>ʿ</i>	E	E
غ	<i>ǧ</i>	<i>gh</i>	<i>ǧ</i>	g	g
ف	<i>f</i>	<i>f</i>	<i>f</i>	f	f
ق	<i>q</i>	<i>q</i>	<i>q</i>	q	q
ك	<i>k</i>	<i>k</i>	<i>k</i>	k	k
ل	<i>l</i>	<i>l</i>	<i>l</i>	l	l
م	<i>m</i>	<i>m</i>	<i>m</i>	m	m
ن	<i>n</i>	<i>n</i>	<i>n</i>	n	n
ه	<i>h</i>	<i>h</i>	<i>h</i>	h	h
و	<i>w</i>	<i>w</i>	<i>w</i>	w	w
ي	<i>y</i>	<i>y</i>	<i>y</i>	y	y
ى	<i>ā</i>	<i>á</i>	<i>ā</i>	Y	Y
ة	<i>ah</i>	<i>ah</i>	<i>a</i>	p	p

<sup>36</sup>I am grateful to Graeme Andrews who suggested that the ‘safe’ scheme be included in `arabluatex`.

<sup>37</sup>See section 7 on page 30.

Letter	Transliteration			Buckwalter notation	
	dmg	loc	arabica	base/xml	safe
ع	’	’	’	’	C
آ	’ā	’ā	’ā		M
أ	’	’	’	>	O
ؤ	’	’	’	&	W
إ	’	’	’	<	I
ئ	’	’	’	]	Q
ـ	—	—	—	~	~
ا	,	,	—	[	L
أ	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
أ	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>	<i>u</i>
أ	<i>i</i>	<i>i</i>	<i>i</i>	<i>i</i>	<i>i</i>
ان	<i>an</i>	<i>an</i>	<i>an</i>	F	F
ان	<i>un</i>	<i>un</i>	<i>un</i>	N	N
ان	<i>in</i>	<i>in</i>	<i>in</i>	K	K
ا	—	—	—	o	o
ا	ā	ā	ā	`	e
ـ (taṭwīl)	—	—	—	—	—

Table 7: Buckwalter scheme

**Transliteration** The Buckwalter notation can also be transliterated into any accepted romanization standard of Arabic. See above section 7 on page 30 for more information. However, it should be pointed out again that only accurate coding produces accurate transliteration. It is therefore at the very least highly advisable to use the hyphen for tying the definite article and the inseparable particles (viz. prepositions, adverbs and conjunctions) to words, like so:—

Al-EaAlamu الْعَالَمُ *al-‘ālam<sup>u</sup>*, Al-camsu الشَّمْسُ *aš-šams<sup>u</sup>*, bi-SinaAEapi  
Al-T~ib~i, بِصِنَاعَةِ الطِّبِّ *bi-ṣinā‘at<sup>i</sup> ’t-ṭibb<sup>i</sup>*.  
wa-Al-l~ehi وَاللَّهِ *wa-’l-lāh<sup>i</sup>*, Al-Hamdu li-l~ehi اَلْحَمْدُ لِلَّهِ *al-ḥamd<sup>u</sup>*  
*li-llāh<sup>i</sup>*.

Similarly, it is not advisable to use | and [ (‘base’ and ‘xml’ schemes) or M and L (‘safe’ scheme) to encode the *‘alif<sup>u</sup> ’l-mamdūdāt<sup>i</sup>* and the *‘alif<sup>u</sup> ’l-waṣl<sup>i</sup>* for such signs are supposed to be generated by arabluatex internal functions. Besides, as they do not *per se* convey any morphological information on what they are derived from,

they cannot be transliterated accurately. To take one example, <ilY Al-LntiqADi gives اِلَى الْاِنْتِقَاضِ as expected, but only <ilY Al-intiqADi can be transliterated as *ila 'l-intiqāḍi* with the correct vowel ⟨i⟩ in place of the *'alif<sup>u</sup> 'l-waṣl<sup>i</sup>*.

## 9 Unicode Arabic input

As said above in section 8 on page 34 about the Buckwalter input scheme, even though `arabluatex` is primarily designed to process the `ArabTeX` notation, it also accepts unicode Arabic input. It should be noted that `arabluatex` does in no way interfere with unicode Arabic input: none of the `voc`, `fullvoc`, `novoc` or `trans` options will have any effect on plain unicode Arabic for the time being.

That said, there are two ways of inserting unicode Arabic:

- `\txarb` (a) The `\txarb{<unicode Arabic>}` command for inserting unicode Arabic text in paragraphs;
- `txarab` (b) The `txarab` environment for inserting running paragraphs of Arabic text, like so:—

```
1 \begin{txarab}
2   <Unicode Arabic text>
3 \end{txarab}
```

## 10 L<sup>A</sup>T<sub>E</sub>X Commands in Arabic environments

**General principle** L<sup>A</sup>T<sub>E</sub>X commands are accepted in Arabic environments. The general principle which applies is that single-argument commands (`\command{<arg>}`) such as `\emph{<text>}`, `\textbf{<text>}` and the like, are assumed to have Arabic text as their arguments:—

`\abjad{45} kitAbu-hu \emph{fI 'l-\cap{`AdAt-i}}` مَهْ كَاتِبُهُ فِي الْعَادَاتِ 45  
*kitābu-hu fi 'l-Ādāt*.<sup>38</sup>

The same applies to footnotes:—

```
1 \renewcommand{\footnoterule}%
2   {\hfill\noindent\rule[1mm]{.4\textwidth}{.15mm}}
3 \begin{arab}
4 'inna 'abI kAna mina 'l-muqAtilaT-i\footnote{al-muqAtilaT-i:
5 al-muqAtil-Ina.}, wa-kAnat 'ummI min `u.zamA'-i buyUt-i
6 'l-zamAzimaT-i\footnote{al-zamAzimaT-u: .tA'ifaT-u mina
7 'l-furs-i.}.
```

<sup>38</sup>This is odd in Arabic script, but using such features as `\emph` or `\textbf` is a matter of personal taste.

8 \end{arab}

إِنَّ أَبِي كَانَ مِنَ الْمُقَاتِلَةِ<sup>a</sup>، وَكَانَتْ أُمِّي مِنْ عُظَمَاءِ بُيُوتِ الزَّمَاذِمَةِ<sup>b</sup>.

<sup>a</sup>الْمُقَاتِلَةُ: الْمُقَاتِلِينَ.  
<sup>b</sup>الزَّمَاذِمَةُ: طَائِفَةٌ مِنَ الْفُرْسِ.

Some commands, however, do not expect running text in their arguments, or one may wish to insert English text eg. in footnotes or in marginal notes. `arabluatex` provides a set of commands to handle such cases.

`\LR{<arg>}` is designed to typeset its argument from left to right. It may be used in an Arabic environment, either `\arb{<Arabic text>}` or `\begin{arab} <Arabic text> \end{arab}`, for short insertions of left-to-right text, or to insert any `LATEX` command that would otherwise be rejected by `arabluatex`, such as commands the argument of which is expected to be a dimension or a unit of measurement.

`\RL{<arg>}` does the same as `\LR{<arg>}`, but typesets its argument from right to left. Even in an Arabic environment, this command may be useful.

For example, to distinguish words with a different color, one may proceed like so:—

```
1 \begin{arab}
2 _tumma "intalaqa_dU 'l-qarn-ayni 'il_A 'ummaT-iN 'u_hr_A fI
3 \LR{\textcolor{red}{\arb[fullvoc]{((ma.tli`-i 'l-^sams-i))}}}
4 wa-lA binA'-a la-hum yu'amminu-hum mina 'l-^sams-i.
5 \end{arab}
```

ثُمَّ أَتَلَقَ ذُو الْقَرْنَيْنِ إِلَى أُمَّةٍ أُخْرَى فِي ﴿مَطْلِعِ الشَّمْسِ﴾ وَلَا بِنَاءَ لَهُمْ يُؤْمِنُهُم مِنَ الشَّمْسِ.

`\LRfootnote{<text>}` and `\RLfootnote{<text>}` typeset left-to-right and right-to-left footnotes respectively in Arabic environments. Unlike `\footnote{<text>}`, the arguments of both `\LRfootnote` and `\RLfootnote` are not expected to be Arabic text. For example, `\LRfootnote` may be used to insert English footnotes in running Arabic text:—

```
1 \arb[fullvoc]{\cap{z}ayd-uN\LRfootnote{%
2 \enquote{\arb[trans]{\cap{z}ayd} is the son of
3 \arb[trans]{\cap{`a}mr}}: the second
4 noun is not in apposition to the first, but forms
5 part of the predicate\ldots} "ibn-u \cap{`a}mr-iNU}
```

زَيْدٌ<sup>a</sup> ابْنُ عَمْرٍو

<sup>a</sup> “*Zayd* is the son of *‘Amr*”: the second noun is not in apposition to the first, but forms part of the predicate...

When footnotes are typeset from right to left, it may happen that the numbers of the footnotes that are at the bottom of the page be typeset in the wrong direction. For example, instead of an expected number 18, one may get 81. `arabluatex` is not responsible for that, but should it happen, it may be necessary to redefine in the preamble the `LATEX` macro `\thefootnote` like so:—

```
\renewcommand*{\thefootnote}{\textsuperscript{\LR{\arabic{footnote}}}}
```

`\FixArbFtnmk` Another solution is to put in the preamble, below the line that loads `arabluatex`, the `\FixArbFtnmk` command. However, for more control over the layout of footnotes marks, it is advisable to use the `scrextend` package.<sup>39</sup>

`\LRmarginpar` The `\LRmarginpar` command does for marginal notes the same as `\LRfootnote` does for footnotes. Of course, it is supposed to be used in Arabic environments. Note that `\marginpar` also works in Arabic environments, but it acts as any other single-argument command inserted in Arabic environments. The general principle laid on page 37 applies.

`\setRL` `\setLR` `\setLR` and `\setLR` may be used to change the direction of paragraphs, either form left to right or from right to left. As an example, an easy way to typeset a right-to-left sectional title follows:—

```
1 \setRL
2 \section*{\arb{barzawayhi li-buzurjumihra bn-i 'l-buxtikAni}}
3 \setLR
4 \begin{arab}
5 qAla barzawayhi bn-u 'azhar-a, ra's-u 'a.tibbA'-i fAris-a...
6 \end{arab}
```

بَرْزَوِيهِ لِزُجْمِهِرِ بْنِ الْبُخْتِكَانِ  
قَالَ بَرْزَوِيهِ بْنُ أَزْهَرَ، رَأْسُ أَطِبَّاءِ فَارِسَ...

## 10.1 Environments

Environments such as `\begin{quote}... \end{quote}` may be nested inside the `arab` environment. Up to one optional argument may be passed to each nested environment, like so:—

<sup>39</sup>See <http://ctan.org/pkg/koma-script>; read the documentation of KOMA-script for details about the `\deffootnotemark` and `\deffootnote` commands.

```

1 \begin{arab}
2   \begin{<environment>}[<options>]
3     <Arabic text>
4   \end{<environment>}
5 \end{arab}

```

In the following example, the quoting package is used:—

```

1 \setquotestyle{arabic}
2 \begin{arab}[fullvoc]
3   kAna \cap{'abU} \cap{'l-hu_dayli} 'ahd_A 'il_A \cap{muwaysiN}
4   dajAjaTaN. wa-kAnat dajAjatu-hu 'llatI 'ahdA-hA dUna mA kAna
5   yuttaxa_du li-\cap{muwaysiN}. wa-l_akinna-hu bi-karami-hi
6   wa-bi-.husni xuluqi-hi 'a.zhara 'l-ta`ajjuba min simani-hA
7   wa-.tIbi la.hmi-hA. wa-kAna <\cap{'abU} \cap{'l-hu_dayli}>
8   yu`rafu
9   bi-'l-'imsAki 'l-`sadIdi. fa-qAla: \enquote{wa-kayfa ra'ayta ya
10     \cap{'abA} \cap{'imrAna} tilka 'l-dajAjaTa?} qAla:
11   \enquote{kAnat `ajabaN mina 'l-`ajabi!} fa-yaqUlu:
12   \begin{quoting}[begintext=», endtext=«]
13     wa-tadrI mA jinsu-hA? wa-tadrI mA sinnu-hA? fa-'inna
14     'l-dajAjaTa 'inna-mA ta.tIbu bi-'l-jinsi wa-'l-sinni. wa-tadrI
15     bi-'ayyi `say'iN kunnA nusamminu-hA? wa-fI 'ayyi makAniN kunnA
16     na`lifu-hA?
17   \end{quoting}
18   fa-lA yazAlu fI h_a_dA wa-'l-'A_haru ya.d.haku .da.hkaN
19   na`rifu-hu
20   na.hnu wa-lA ya`rifu-hu \cap{'abU} \cap{'l-hu_dayli}.
21 \end{arab}

```

كَانَ أَبُو الْهَذِيلِ أَهْدَى إِلَى مُوسَى دَجَاجَةً. وَكَانَتْ دَجَاجَتُهُ الَّتِي أَهْدَاهَا دُونَ مَا كَانَ يَتَّخِذُ لِمُوسَى. وَلَكِنَّهُ  
يَكْرَهُهُ وَيُحْسِنُ خُلُقَهُ أَظْهَرَ التَّعَجُّبِ مِنْ سَمْنِهَا وَطَيْبِ لَحْمِهَا. وَكَانَ أَبُو الْهَذِيلِ يُعْرِفُ بِالْأَمْسَاكِ الشَّدِيدِ.  
فَقَالَ: «وَكَيْفَ رَأَيْتَ يَا أَبَا عِمْرَانَ تِلْكَ الدَّجَاجَةَ؟» قَالَ: «كَانَتْ عَجَبًا مِنَ الْعَجَبِ!» فَيَقُولُ:

« وَتَدْرِي مَا جَنَسُهَا؟ وَتَدْرِي مَا سَنُهَا؟ فَإِنَّ الدَّجَاجَةَ إِذَا تَطَيَّبَ بِالْجَنَسِ وَالسِّنِّ. وَتَدْرِي بِأَيِّ شَيْءٍ كُنَّا نُسَمِّنُهَا؟ وَفِي أَيِّ  
مَكَانٍ كُنَّا نَعْلِفُهَا؟ »

فَلَا يَزَالُ فِي هَذَا وَالْآخِرِ يَضْحَكُ ضَحْكًا نَعْرِفُهُ نَحْنُ وَلَا يَعْرِفُهُ أَبُو الْهَذِيلِ.



### 10.1.1 Lists

Lists environments are also accepted inside the `arab` environment. One may either use any of the three standard list environments, viz. `itemize`, `enumerate` and `description` or use a package that provides additional refinements such as `paralist`.

To take a first example, should one wish to typeset a list of manuscripts, the `description` environment may be used like so:—

```
1 \setRL\paragraph{\arb[novoc]{rumUzi 'l-kitAbi}}\setLR
2 \begin{arab}[novoc]
3   \begin{description}
4     \item[b] max.tU.tu 'l-maktabaTi 'l-'ahliyyaTi bi-\cap{bArIs} 2860
5       `arabiyuN.
6     \item[s] max.tU.tu 'l-maktabaTi 'l-'ahliyyaTi bi-\cap{bArIs} 2859
7       `arabiyuN.
8     \item[m] max.tU.tu majlisi \arb[novoc]{~sUrAY malY} .tahrAna 521.
9   \end{description}
10 \end{arab}
```

رموز الكتاب  
ب مخطوط المكتبة الأهلية بباريس ٢٨٦٠ عربيّ.  
س مخطوط المكتبة الأهلية بباريس ٢٨٥٩ عربيّ.  
م مخطوط مجلس شورى ملي طهران ٥٢١.

As a second example, the contents of a treatise may be typeset with the standard list environments, like so:—

```
1 \setRL\centerline{\arb{\textbf{al-qAnUnu fI 'l-.tibbi}}}\setLR
2 \begin{arab}
3   \begin{itemize}
4     \item \textbf{al-fannu 'l-'awwalu} fI .haddi 'l-.tibbi
5       wa-maw.dU`Ati-hi mina 'l-'umUri 'l-.tabI`iyyaTi wa-ya`stamilu
6       `al_A sittaTi ta`AlImiN
7     \begin{itemize}
8       \item \textbf{al-ta`lImu 'l-'awwalu} [wa-huwa fa.slAni]
9         \begin{itemize}
10           \item \textbf{al-fa.slu 'l-'awwalu}
11         \end{itemize}
12       \end{itemize}
13     \end{itemize}
14 \end{arab}
```

القانون في الطبّ

- الْفَنُّ الْأَوَّلُ فِي حَدِّ الطِّبِّ وَمَوْضُوعَاتِهِ مِنَ الْأُمُورِ الطَّبِيعِيَّةِ وَيَشْتَمِلُ عَلَى سِتَّةِ تَعَالِيمٍ  
 - التَّلْعِيمُ الْأَوَّلُ [وَهُوَ فَصْلَانِ]  
 - الْفَصْلُ الْأَوَّلُ

**Caveat** The various French definition files of the babel package viz. `acadian`, `canadien`, `français`, `frenchb` or `french` all redefine the list environments, which breaks the standard definition file that is used by `arabxuatex`. Therefore, `babel-french` must be loaded with the `StandardLists=true` option, like so:—

```
1 \usepackage[french]{babel}
2 \frenchsetup{StandardLists=true}
```

This option will prevent `babel-french` from interfering with the layout of the document. Then the package `paralist` may be used to make the lists ‘compact’ as `babel-french` do.

## 10.2 csquotes

The recommended way of inserting quotation marks in running Arabic text is to use `csquotes`. With the help of the `\DeclareQuoteStyle` command, one can define an Arabic style, like so:—

```
1 \usepackage{csquotes}
2 \DeclareQuoteStyle{arabic}
3 {\rmfamily\textquotedblright}{\rmfamily\textquotedblleft}
4 {\rmfamily\textquoteright}{\rmfamily\textquoteleft}
```

Then, use this newly defined style with `\setquotestyle`, like so:—

```
1 \setquotestyle{arabic}
2 \begin{arab}
3   fa-qAla la-hu ju.hA: \enquote{.garIb-uN 'amru-ka yA .sadiqI
4     'a-tu.saddiqu 'l-.himAr-a wa-tuka_d_diba-nI?}
5 \end{arab}
6 \setquotestyle{english}
```

فَقَالَ لَهُ جُحَا: “غَرِيبُ أَمْرِكَ يَا صَدِيقِي أَتَصَدِّقُ الْجَمَارَ وَتُكَذِّبُنِي؟”

REM. Do not forget to set back the quoting style to its initial state once the Arabic environment is closed. See the last line in the code above.

### 10.3 reledmac

The two-arguments command `\edtext{<lemma>}{<commands>}` is supported inside `\begin{arab} ... \end{arab}`. As an example, one may get `arabluatex` and `reledmac` to work together like so:—

```
1 \beginnumbering
2 \pstart
3 \begin{arab}
4 wa-ya.sīru ta.hta 'l-jild-i
5 \edtext{\arb{.sadId-uN}}{\Afootnote{M: \arb{.sadId-aN} E1}}
6 \end{arab}
7 \pend
8 \endnumbering
```

### 10.4 quran

`arabluatex` is compatible with the `quran` package so that both can be used in conjunction with one another for typesetting the *Qur'ān*. As `quran` draws the text of the *Qur'ān* from a unicode encoded database, its commands have to be passed as arguments to the `\txarb` command for short insertions in left-to-right paragraphs, or inserted inside the `txarab` environment for typesetting running paragraphs of *Qur'ānic* text (see above section 9 on page 37 for more details). Please note that `arabluatex` takes care of formatting the Arabic: therefore, it is recommended to load the `quran` package with the `nopar` option, after `arabluatex` itself has been loaded, like so:—

```
1 \usepackage{arabluatex}
2 \usepackage[nopar]{quran}
```

As an example, the following code will typeset the *sūrah al-Fātiḥah*:—

```
1 \begin{txarab}
2 \quransurah[1]
3 \end{txarab}
```

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ ﴿١﴾ الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ ﴿٢﴾ الرَّحْمَنِ الرَّحِيمِ ﴿٣﴾ مَالِكِ يَوْمِ الدِّينِ ﴿٤﴾  
إِيَّاكَ نَعْبُدُ وَإِيَّاكَ نَسْتَعِينُ ﴿٥﴾ اهْدِنَا الصِّرَاطَ الْمُسْتَقِيمَ ﴿٦﴾ صِرَاطَ الَّذِينَ أَنْعَمْتَ عَلَيْهِمْ غَيْرِ الْمَغْضُوبِ  
عَلَيْهِمْ وَلَا الضَّالِّينَ ﴿٧﴾

## 11 Future work

A short, uncommented, list of what is planned in the versions of `arabluatex` to come follows:

- (a) Short-term:
  - i. `TEI xml` support: `arabluatex` will interoperate with `TEI xml` through new global and local options that will output Arabic in a `TEI xml` compliant file in addition to the usual PDF output: see on page 4.
- (b) Medium-term:
  - i. More languages: the list of supported languages will eventually be the same as `arabtex`: see footnote 4 on page 4.
  - ii. Formulate propositions for extending the `ArabTeX` notation and the transliteration tables. Include them in `arabluatex`. See section 4.9 on page 25.

## 12 Implementation

The most important part of `arabluatex` relies on Lua functions and tables. Read the `.lua` files that accompany `arabluatex` for more information.

```
1 \NeedsTeXFormat{LaTeX2e}
2 \ProvidesPackage{arabluatex}%
3 [2017/06/20 v1.8.5 An ArabTeX-like interface for LuaLaTeX]
4 \RequirePackage{ifluatex}
```

`arabluatex` requires `LuaLaTeX` of course. Issue a warning if the document is processed with another engine.

```
5 \ifluatex\else
6 \PackageError{arabluatex}{lualatex needed}{%
7 Package `arabluatex' needs LuaTeX.\MessageBreak
8 So you should use `lualatex' to process your document.\MessageBreak
9 See documentation of `arabluatex' for further information.}%
10 \expandafter\expandafter\expandafter\csname endinput\endcsname
11 \fi
```

Declare the global options, and define them:

```
12 \DeclareOption{voc}{\def\al@mode{voc}}
13 \DeclareOption{fullvoc}{\def\al@mode{fullvoc}}
14 \DeclareOption{novoc}{\def\al@mode{novoc}}
15 \DeclareOption{trans}{\def\al@mode{trans}}
16 \ExecuteOptions{voc}
17 \ProcessOptions\relax
18 \def\al@mode@voc{voc}
19 \def\al@mode@fullvoc{fullvoc}
20 \def\al@mode@novoc{novoc}
21 \def\al@mode@trans{trans}
```

Packages that are required by `arabluatex`:

```
22 \RequirePackage{etoolbox}
23 \RequirePackage{arabluatex-patch}
```

```

24 \RequirePackage{fontspec}
25 \RequirePackage{amsmath}
26 \RequirePackage{luacode}
27 \RequirePackage{xparse}
28 \RequirePackage{environ}
29 \RequirePackage{adjustbox}
30 \RequirePackage{xkeyval}

```

The following boolean will be set to true in RL mode:

```
31 \newbool{al@rlmode}
```

Here begins the real work: load arabluatex.lua:

```
32 \luadirect{dofile(kpse.find_file("arabluatex.lua"))}
```

This is needed by the current versions of polyglossia and luabidi. luabidi provides a `\Footnote` command. Use it as well if it is loaded.

```
33 \luadirect{tex.enableprimitives("luatex",tex.extraprimitives("omega"))}
```

Font setup. If no Arabic font is selected, issue a warning message and attempt to load the Amiri font which is included in  $\TeX$ Live:

```

34 \AtBeginDocument{\ifdefined\arabicfont\relax\else
35 \PackageWarning{arabluatex}{\string\arabicfont\ is not defined.^^JI
36 will try to load Amiri}%
37 \newfontfamily\arabicfont[Script=Arabic]{Amiri}\fi}%

```

`\setRL` This neutralizes what is defined by the same command in luabidi:

```
38 \AtBeginDocument{\def\setRL{\booltrue{al@rlmode}\pardir TRT\textdir TRT}}
```

`\setLR` The same applies to `\setLR`:

```
39 \AtBeginDocument{\def\setLR{\boolfalse{al@rlmode}\pardir TLT\textdir TLT}}
```

`\LR` This command typesets its argument from left to right. As `\LR` may be already defined, we need to redefine for it to suit our purpose:

```

40 \AtBeginDocument{\ifdef{\LR}%
41 {\RenewDocumentCommand{\LR}{m}{\bgroup\textdir TLT\rmfamily#1\egroup}}
42 {\NewDocumentCommand{\LR}{m}{\bgroup\textdir TLT\rmfamily#1\egroup}}}

```

`\RL` This one typesets its argument from right to left. Same remark as above regarding the need of redefinition.

```

43 \AtBeginDocument{\ifdef{\RL}%
44 {\RenewDocumentCommand{\RL}{m}{\bgroup\textdir TRT\rmfamily#1\egroup}}
45 {\NewDocumentCommand{\RL}{m}{\bgroup\textdir TRT#1\rmfamily\egroup}}}

```

`\aemph` Arabic emphasis. Needs to be redefined as well.

```

46 \AtBeginDocument{\ifdef{\aemph}%
47 {\RenewDocumentCommand{\aemph}{m}{\overline{\text{#1}}}}
48 {\NewDocumentCommand{\aemph}{m}{\overline{\text{#1}}}}}

```

<code>\SetInputScheme</code>	<p>arabluatex is designed for processing Arab<sub>T</sub>E<sub>X</sub> input notation. <code>\SetInputScheme</code> may be used in the preamble or at any point of the document should the user wish to use a different notation such as the ‘Buckwalter scheme’.</p> <pre> 49 \def\al@input@scheme{arabtex} 50 \NewDocumentCommand{\SetInputScheme}{m}{\def\al@input@scheme{#1}} </pre>
<code>\SetArbEasy</code> <code>\SetArbEasy*</code> <code>\SetArbDflt</code>	<p>By default, arabluatex applies complex rules to generate euphonic <i>tašdīd</i>, <i>ʿalif mamdūdah</i> and <i>sukūn</i> depending on the modes which are selected, either <code>voc</code>, <code>fullvoc</code> or <code>trans</code>. Such refinements can be discarded with <code>\SetArbEasy</code>, either globally in the preamble or at any point of the document. Note that <code>\SetArbEasy</code> keeps the <i>sukūn</i> that is generated, while the starred version <code>\SetArbEasy*</code> takes it away. Default complex rules can be set back at any point of the document with <code>\SetArbDflt</code>.</p>
<code>\SetArbDflt*</code>	<p>As of v1.6, arabluatex does not applies any more the assimilation rules that are laid on item <a href="#">b</a> on page <a href="#">16</a>; a new starred version <code>\SetArbDflt*</code> is now available to the user should he wish to apply them.</p> <pre> 51 \def\al@arb@rules{dflt} 52 \NewDocumentCommand{\SetArbEasy}{s}{% 53   \IfBooleanTF{#1} 54   {\def\al@arb@rules{easynosukun}} 55   {\def\al@arb@rules{easy}}} 56 \NewDocumentCommand{\SetArbDflt}{s}{% 57   \IfBooleanTF{#1} 58   {\def\al@arb@rules{idgham}} 59   {\def\al@arb@rules{dflt}}} </pre>
<code>\SetTranslitFont</code>	<p>By default, the font that is used for transliterated text is the main font of the document. Any other font may also be selected with the font-selecting commands of the <code>fontspec</code> package.</p> <pre> 60 \def\al@trans@font{\rmfamily}% 61 \NewDocumentCommand{\SetTranslitFont}{m}{\def\al@trans@font{#1}} </pre>
<code>\SetTranslitStyle</code>	<p>By default any transliterated Arabic text is printed in italics. This can be changed either globally in the preamble or at any point of the document:</p> <pre> 62 \def\al@trans@style{\itshape}% 63 \NewDocumentCommand{\SetTranslitStyle}{m}{\def\al@trans@style{#1}} </pre>
<code>\SetTranslitConvention</code>	<p><code>\SetTranslitConvention{⟨convention⟩}</code> may be used to change the transliteration convention, which is <code>dmg</code> by default:</p> <pre> 64 \def\al@trans@convention{dmg} 65 \NewDocumentCommand{\SetTranslitConvention}{m}{\def\al@trans@convention{#1}} </pre>
<code>\arbup</code> <code>\NoArbUp</code> <code>\ArbUpDflt</code> <code>\SetArbUp</code>	<p>By default, <code>\arbup</code> is set to <code>\textsuperscript</code>. This is how the <i>tanwīn</i> that takes place at the end of a word should be displayed in <code>dmg</code> mode. <code>\NoArbUp</code> may be used either in the preamble or at any point of the document in case one wishes to have the <i>tanwīn</i> on the line. The default rule can be set back with <code>\ArbUpDflt</code> at</p>

any point of the document. Finally `\SetArbUp` may be used to customize the way *tanwīn* is displayed: this command takes the formatting directives as argument, like so: `\SetArbUp{<code>}`.

```
66 \NewDocumentCommand{\al@arbup@dfilt}{m}{\textsuperscript{\thinspace#1}}%
67 \NewDocumentCommand{\al@arbup}{m}{\al@arbup@dfilt{#1}}
68 \NewDocumentCommand{\arbup}{m}{\al@arbup{#1}}
69 \NewDocumentCommand{\ArbUpDflt}{}{\let\al@arbup=\al@arbup@dfilt}
70 \NewDocumentCommand{\NoArbUp}{}{\RenewDocumentCommand{\al@arbup}{m}{##1}}
71 \NewDocumentCommand{\SetArbUp}{m}{\RenewDocumentCommand{\al@arbup}{m}{#1}}
```

`\cap` Proper Arabic names or book titles should be passed to the `\cap` command so that they have their first letters uppercased. `\cap` is actually coded in Lua.

```
72 \DeclareDocumentCommand{\cap}{m}%
73 {\luairect{tex.sprint(cap(\luastringN{#1}))}}
```

`\Cap` `\cap` may be used safely in all of the modes that are provided by `arabluatex` as any of the `voc`, `fullvoc` and `novoc` modes discard it on top of any other functions to be run. `\Cap` does the same as `\cap` except that *it is never discarded*. For that reason, `\Cap` *should never be used outside the trans mode*. `arabluatex` uses `\Cap` internally so as to prevent `\cap` from being discarded in case words that are to be transliterated are inserted into Arabic commands or environments where transliteration is not required. Therefore, it is not documented.

```
74 \let\Cap\cap
```

`\txarb` `\txarb` sets the direction to right-to-left and selects the Arabic font. It is used internally by several Lua functions, but available to the user should he wish to insert utf8 Arabic text in his document.

`\txtrans` `\txtrans` is used internally by several Lua functions to insert transliterated Arabic text. Therefore, it is not documented.

```
75 \DeclareDocumentCommand{\txarb}{+m}{\bgroup\textdir
76 TRT\arabicfont#1\egroup}
77 \DeclareDocumentCommand{\txtrans}{+m}{\bgroup\textdir
78 TLT\al@trans@font#1\egroup}
```

`txarab` The `txarab` environment does for paragraphs the same as `\txarb` does for short insertions of utf8 Arabic text.

```
79 \NewDocumentEnvironment{txarab}{}{%
80 \par%
81 \booltrue{al@rlmode}%
82 \pardir TRT\textdir TRT\arabicfont}{\par}
```

`\arb` The `\arb` command detects which Arabic mode is to be used, either globally if no option is set, or locally, then passes its argument to the appropriate Lua function.

```
83 \DeclareDocumentCommand{\arb}{0{\al@mode} +m}%
84 {\edef\@tempa{#1}%
85 \ifx\@tempa\al@mode@voc%
86 \bgroup\textdir TRT\arabicfont%
```

```

87 \luadirect{tex.sprint(processvoc(\luastringN{#2},
88 \luastring0{\al@arb@rules}, \luastring0{\al@input@scheme}}))\egroup%
89 \else%
90 \ifx\@tempa\al@mode@fullvoc%
91 \bgroup\textdir TRT\arabicfont%
92 \luadirect{tex.sprint(processfullvoc(\luastringN{#2},
93 \luastring0{\al@arb@rules}, \luastring0{\al@input@scheme}}))\egroup%
94 \else%
95 \ifx\@tempa\al@mode@novoc%
96 \bgroup\textdir TRT\arabicfont%
97 \luadirect{tex.sprint(processnovoc(\luastringN{#2},
98 \luastring0{\al@arb@rules}, \luastring0{\al@input@scheme}}))\egroup%
99 \else%
100 \ifx\@tempa\al@mode@trans%
101 \bgroup\textdir TLT\al@trans@style%
102 \luadirect{tex.sprint(processtrans(\luastringN{#2},
103 \luastring0{\al@trans@convention},
104 \luastring0{\al@arb@rules},
105 \luastring0{\al@input@scheme}}))\egroup%
106 \else%
107 \fi\fi\fi\fi}

```

**arab** The arab environment does for paragraphs the same as \arb does for short insertions of Arabic text.

```

108 \NewEnviron{arab}[1][\al@mode]%
109 {\par\edef\@tempa{#1}%
110 \ifx\@tempa\al@mode@voc%
111 \booltrue{al@rlmode}%
112 \bgroup\pardir TRT\textdir TRT\arabicfont%
113 \luadirect{tex.sprint(processvoc(\luastring0{\BODY},
114 \luastring0{\al@arb@rules}, \luastring0{\al@input@scheme}}))\egroup%
115 \else%
116 \ifx\@tempa\al@mode@fullvoc%
117 \booltrue{al@rlmode}%
118 \bgroup\pardir TRT\textdir TRT\arabicfont%
119 \luadirect{tex.sprint(processfullvoc(\luastring0{\BODY},
120 \luastring0{\al@arb@rules}, \luastring0{\al@input@scheme}}))\egroup%
121 \else%
122 \ifx\@tempa\al@mode@novoc%
123 \booltrue{al@rlmode}%
124 \bgroup\pardir TRT\textdir TRT\arabicfont%
125 \luadirect{tex.sprint(processnovoc(\luastring0{\BODY},
126 \luastring0{\al@arb@rules}, \luastring0{\al@input@scheme}}))\egroup%
127 \else%
128 \ifx\@tempa\al@mode@trans%
129 \bgroup\pardir TLT\textdir TLT\al@trans@style%
130 \luadirect{tex.sprint(processtrans(\luastring0{\BODY},
131 \luastring0{\al@trans@convention},
132 \luastring0{\al@arb@rules},
133 \luastring0{\al@input@scheme}}))\egroup%

```



```
134 \else \fi\fi\fi\fi}{\par}
```

**arabverse** The arabverse environment may receive different options: mode, width, gutter, metre, utf and delim; all of them are defined here just before the arabverse environment:

```
135 \newlength{\al@bayt@width}
136 \newlength{\al@gutter@width}
137 \setlength{\al@bayt@width}{.3\textwidth}
138 \setlength{\al@gutter@width}{.15\al@bayt@width}
139 \define@key[al]{verse}{width}{\setlength{\al@bayt@width}{#1}}
140 \define@key[al]{verse}{gutter}{\setlength{\al@gutter@width}{#1}}
141 \define@key[al]{verse}{metre}{\arb{#1}}
142 \define@boolkey[al]{verse}{utf}[true]{}
143 \define@boolkey[al]{verse}{delim}[true]{}
144 \define@choicekey[al]{verse}{mode}{fullvoc, voc, novoc,
145   trans}{\def\al@mode{#1}}
146 \presetkeys[al]{verse}{metre=\LR{\vskip -\baselineskip}, utf=false,
147   delim=false}{}

```

Then follows the environment itself:

```
148 \NewDocumentEnvironment{arabverse}{0{}}%
149 {\par\centering\noindent\bgroup\setkeys[al]{verse}[metre]{#1}%
150   \ifx\al@mode\al@mode@trans%
151   \ifal@verse@utf\setRL{else}\setLR{fi}%
152   \else\setRL{fi}%
153   \hfill\setkeys[al]{verse}[width,gutter,utf,mode]{#1}\egroup}

```

**\bayt** Each verse consists of two hemistichs; therefore the `\bayt` command takes two arguments, the first receives the *ṣadr* and the second the *ʿağuz*. That two subsequent hemistichs should be connected with one another is technically named *tadwīr*. In some of these cases, the hemistichs may be connected by a prominent horizontal flexible stroke which is drawn by the `\al@verse@stroke` command.

**\SetHemistichDelim** A hemistich delimiter also may be defined. By default, it is set to the ‘star’ character: `*`. The `\SetHemistichDelim{<delimiter>}` command may be used at any point of the document to change this default setting.

```
154 \NewDocumentCommand{\arb@utf}{m}{%
155   \ifal@verse@utf\txarb{#1}\else\arb{#1}\fi}
156 \def\al@hemistich@delim{*}
157 \NewDocumentCommand{\SetHemistichDelim}{m}{\def\al@hemistich@delim{#1}}
158 \def\al@verse@stroke{\leavevmode\xleaders\hbox{\arb{--}}\hfill\kern0pt}
159 \NewDocumentCommand{\bayt}{m o m}{%
160   \ifdefined\savenotes\savenotes\else\fi%
161   \edef\al@tatweel{--}%
162   \adjustbox{width=\al@bayt@width, height=\Height}{\arb@utf{#1}}%
163   \IfNoValueTF{#2}{%
164     \ifal@verse@delim\makebox[\al@gutter@width][c]{\al@hemistich@delim}%
165     \else%
166     \hspace{\al@gutter@width}%

```

```

167   \fi
168 }{%
169   \edef\@tempa{#2}%
170   \ifx\@tempa\al@tatweel%
171   \ifx\al@mode\al@mode@trans%
172   \hspace{\al@gutter@width}%
173   \else%
174   \makebox[\al@gutter@width][s]{\al@verse@stroke}%
175   \fi%
176   \else%
177   \ifx\al@mode\al@mode@trans%
178   \adjustbox{width=\al@gutter@width, height=\Height}{\arb@utf{#2}}%
179   \else%
180   \makebox[\al@gutter@width][s]{\arb@utf{#2}}%
181   \fi\fi}%
182 \adjustbox{width=\al@bayt@width, height=\Height}{\arb@utf{#3}}%
183 \ifdefined\spewnotes\spewnotes\else\fi%
184 }

```

`\abjad` `\abjad{⟨number⟩}` expresses its argument in Arabic letters in accordance with the *abjad* arrangement of the alphabet. `⟨number⟩` must be between 1 and 1999. It is now coded in Lua so that polyglossia is no longer needed. See `arabluatex.lua` for more information.

```

185 \AtBeginDocument{%
186   \ifdefined\abjad%
187   \RenewDocumentCommand{\abjad}{m}%
188   {\luairect{tex.sprint(abjadify(#1))}}%
189   \else%
190   \NewDocumentCommand{\abjad}{m}%
191   {\luairect{tex.sprint(abjadify(#1))}}
192 \fi}

```

`\arbnul1` The `\arbnul1` command does nothing by itself. It is processed only if it is found in Arabic context so as to put back on contextual analysis in case it has been broken by other commands.

```

193 \NewDocumentCommand{\arbnul1}{m}{\relax}

```

`\abraces` `\abraces{⟨Arabic text⟩}` puts its argument between braces. This macro is written in Lua and is dependent on the current value of `tex.textdir`.

```

194 \NewDocumentCommand{\abraces}{+m}{%
195   \luairect{tex.sprint(abraces(\luastringN{#1}))}}

```

`\LRmarginpar` `\LRmarginpar` is supposed to be inserted in an Arabic environment. It typsets his argument in a marginal note from left to right.

```

196 \DeclareDocumentCommand{\LRmarginpar}{m}{\marginpar{\textdir TLT #1}}

```

`\LRfootnote` `\LRfootnote` and `\RLfootnote` are supposed to be used in Arabic environments for insertions of non Arabic text. `\LRfootnote` typesets its argument left-to-right...

```

\RLfootnote while \RLfootnote typesets its argument left-to-right.
197 \DeclareDocumentCommand{\LRfootnote}{m}{\bgroup\pdir
198   TLT\LR{\footnote{#1}}\egroup}
199 \DeclareDocumentCommand{\RLfootnote}{m}{\bgroup\pdir
200   TRT\LR{\footnote{#1}}\egroup}

```

`\FixArbFtnmk` In the preamble, just below `\usepackage{arabluatex}`, `\FixArbFtnmk` may be of some help in case the footnote numbers at the bottom of the page are printed in the wrong direction. This quick fix uses and loads `scrextend` if it is not already loaded.

```

201 \NewDocumentCommand{\FixArbFtnmk}{}{%
202   \@ifpackageloaded{scrextend}%
203   {\AtBeginDocument{\deffootnote{2em}{1.6em}{\LR{\thefootnotemark}.\enskip}}}%
204   {\RequirePackage{scrextend}
205    \AtBeginDocument{\deffootnote{2em}{1.6em}{\LR{\thefootnotemark}.\enskip}}}%

```

That is it. Say goodbye before leaving.

## Patches

```

206 \NeedsTeXFormat{LaTeX2e}
207 \ProvidesPackage{arabluatex-patch}%
208 [2016/11/14 v1.0 patches for arabluatex]

```

I have put in a separate `.sty` file external lines of code that I had to patch for a good reason. I hate doing this, and hopefully, most of these lines will disappear as soon as they are not required anymore.

The following is taken from `latex.ltx`. I had to make this patch for I could not find a way to process the list environments in right-to-left mode. The LuaTeX primitives `\bodydir` and `\pagedir` will eventually allow us to get rid of this:

```

209 \def\list#1#2{%
210   \ifnum \@listdepth >5\relax
211     \@toodeep
212   \else
213     \global\advance\@listdepth\@ne
214   \fi
215   \rightmargin\z@
216   \listparindent\z@
217   \itemindent\z@
218   \csname @list\romannumeral\the\@listdepth\endcsname
219   \def\@itemlabel{#1}%
220   \let\makelabel\@mklab
221   \@nmbrrlistfalse
222   #2\relax
223   \@trivlist
224   \parskip\parsep
225   \parindent\listparindent
226   \advance\linewidth -\rightmargin
227   \advance\linewidth -\leftmargin

```

patch begins:

```

228 \ifbool{al@rlmode}{\advance\@totalleftmargin \rightmargin}%
229 {\advance\@totalleftmargin \leftmargin}
patch ends.
230 \parshape \@ne \@totalleftmargin \linewidth
231 \ignorespaces}
232 \def\@item[#1]{%
233 \if@nparitem
234 \@donoparitem
235 \else
236 \if@inlabel
237 \indent \par
238 \fi
239 \ifhmode
240 \unskip\unskip \par
241 \fi
242 \if@newlist
243 \if@nobreak
244 \@nbitem
245 \else
246 \addpenalty\@beginparpenalty
247 \addvspace\@topsep
248 \addvspace{-\parskip}%
249 \fi
250 \else
251 \addpenalty\@itempenalty
252 \addvspace\itemsep
253 \fi
254 \global\@inlabeltrue
255 \fi
256 \everypar{%
257 \@minipagefalse
258 \global\@newlistfalse
259 \if@inlabel
260 \global\@inlabelfalse
261 {\setbox\z@\lastbox
262 \ifvoid\z@
263 \kern-\itemindent
264 \fi}%
265 \box\@labels
266 \penalty\z@
267 \fi
268 \if@nobreak
269 \@nobreakfalse
270 \clubpenalty \@M
271 \else
272 \clubpenalty \@clubpenalty
273 \everypar{}%
274 \fi}%
275 \if@noitemarg

```

```

276    \@noitemargfalse
277    \if@nmbrlist
278        \refstepcounter\@listctr
279    \fi
280 \fi

patch begins:
281 \ifbool{al@rlmode}{\sRLbox\@tempboxa{\makelabel{#1}}}{%
282 \sbox\@tempboxa{\makelabel{#1}}}%
283 \ifbool{al@rlmode}{\global\setbox\@labels\hbox dir TRT}{%
284 {\global\setbox\@labels\hbox}{%

patch ends.
285 \unhbox\@labels
286 \hskip \itemindent
287 \hskip -\labelwidth
288 \hskip -\labelsep
289 \ifdim \wd\@tempboxa >\labelwidth
290     \box\@tempboxa
291 \else
292     \hbox to\labelwidth {\unhbox\@tempboxa}%
293 \fi
294 \hskip \labelsep}%
295 \ignorespaces}

This is adapted from Vafa Khalighi's bidi package. Thanks to him.
296 \long\def\sRLbox#1#2{\setbox#1\hbox dir TRT{%
297 \color@setgroup#2\color@endgroup}}

```

## References

- Brockelmann, Carl et al. (1935). “Die Transliteration der arabischen Schrift in ihrer Anwendung auf die Hauptliteratursprachen der islamischen Welt”. In: *Denkschrift dem 19. internationalen Orientalistenkongreß in Rom vorgelegt von der Transkriptionskommission der Deutschen Morgenländischen Gesellschaft*. In collab. with Ph. S. van Ronkel and Otto Spies. Leipzig: Deutsche Morgenländische Gesellschaft, in Kommission bei F. A. Brockhaus. URL: [http://www.naher-osten.uni-muenchen.de/studium\\_lehre/werkzeugkasten/dmgtransliteration.pdf](http://www.naher-osten.uni-muenchen.de/studium_lehre/werkzeugkasten/dmgtransliteration.pdf).
- Habash, Nizar Y. (2010). *Introduction to Arabic Natural Language Processing*. Synthesis Lectures on Human Language Technologies 10. Toronto: Morgan & Claypool Publishers.
- Hosny, Khaled (2015). *Amiri*. URL: <http://www.amirifont.org/>.
- DIN 31 635 (2011). *Information and Documentation - Romanization of the Arabic Alphabet for Arabic, Ottoman-Turkish, Persian, Kurdish, Urdu and Pushto*. URL: <http://www.din.de>.
- Lagally, Klaus (2004). *ArabTeX. Typesetting Arabic and Hebrew*. User Manual Version 4.00. Version 4.00. URL: <http://mirrors.ctan.org/language/arabic/arabtex/doc/html/arabtex.htm>.

- Lane, Edward William (1863–1893). *An Arabic-English lexicon*. 8 vols. London – Edinburgh: Williams and Norgate.
- Wright, W. LL.D (1896). *A Grammar of the Arabic Language*. Rev. by W. Robertson Smith and M. J. de Goeje. With a forew. by Pierre Cachia. 3rd ed. 2 vols. Beirut: Librairie du Liban.

## Change History

v1.0	General: Initial release . . . . .	1	v1.5	General: Compatibility with the quran package . . . . .	43
v1.0.1	General: Minor update of the documentation . . . . .	1		Environments may be nested inside the <b>arab</b> environment . .	39
v1.1	<b>\abjad</b> : New and more flexible <b>\abjad</b> command. . . . .	50		<b>txarab</b> : New <b>txarab</b> environment for typesetting running paragraphs in unicode Arabic .	47
v1.2	<b>\SetArbEasy</b> : New <b>\SetArbEasy/\SetArbDflt</b> for ‘modern’ or ‘classic’ Arabic styles. . . . .	46	v1.6	<b>arabverse</b> : New environment <b>arabverse</b> for typesetting Arabic poetry . . . . .	49
v1.3	<b>\arbup</b> : <i>ʾirāb</i> is now written as superscript text in <b>dmg</b> mode by default. . . . .	46		<b>\bayt</b> : New macro <b>\bayt</b> for typesetting each verse inside the <b>arabverse</b> environment . . . .	49
v1.4	<b>\SetInputScheme</b> : <b>\SetInputScheme</b> may be used to process other input schemes such as ‘Buckwalter’ . . . . .	46		<b>\SetArbDflt*</b> : This starred version applies the assimilation rules in addition to what <b>\SetArbDflt</b> already does. . . . .	46
	<b>\SetTranslitFont</b> : For selecting a specific font for transliterated texts . . . . .	46		<b>\SetHemistichDelim</b> : New <b>\SetHemistichDelim</b> command for changing the default delimiter between hemistichs .	49
v1.4.3	<b>\abraces</b> : New <b>\abraces</b> command which expresses its argument between braces. . . . .	50	v1.7	<b>\arbnul</b> : New <b>\arbnul</b> command for putting back on any contextual analysis rule broken by other commands. . . . .	50
v1.4.4	<b>\SetArbEasy*</b> : this starred version discards the <i>sukūn</i> in addition to what is already discarded by <b>\SetArbEasy</b> . . . . .	46	v1.8	General: <b>arabica</b> transliteration standard is now supported . . .	31
			v1.8.5	General: Six additional Persian characters are now available . . .	9

# Index

Numbers written in *italic* refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

Symbols		
\@M . . . . .	270	\adjustbox 162, 178, 182
\@beginparpenalty .	246	\advance . . . . . 213,
\@clubpenalty . . . . .	272	226, 227, 228, 229
\@donoparitem . . . . .	234	\aemph . . . . . 25, <u>46</u>
\@ifpackageloaded .	202	\al@arb@rules . . . 51,
\@inlabelfalse . . . . .	260	54, 55, 58, 59,
\@inlabeltrue . . . . .	254	88, 93, 98, 104,
\@item . . . . .	232	114, 120, 126, 132
\@itemlabel . . . . .	219	\al@arbup . . . . .
\@itempenalty . . . . .	251	. 67, 68, 69, 70, 71
\@labels . . . . .	265, 283, 284, 285	\al@arbup@dflt . . . . .
\@listctr . . . . .	278	66, 67, 69
\@listdepth 210, 213, 218		\al@bayt@width . . . . .
\@minipagefalse . . . . .	257	. . . . . 135, 137,
\@mklab . . . . .	220	138, 139, 162, 182
\@nbitem . . . . .	244	\al@gutter@width . . . . .
\@ne . . . . .	213, 230	. . . . . 136, 138,
\@newlistfalse . . . . .	258	140, 164, 166,
\@nmbrlistfalse . . . . .	221	172, 174, 178, 180
\@nobreakfalse . . . . .	269	\al@hemistich@delim
\@noitemargfalse . . . . .	276	. . . . . 156, 157, 164
\@tempa . . . . .	84,	\al@input@scheme . . . . .
85, 90, 95, 100,		. . . . . 49, 50,
109, 110, 116,		88, 93, 98, 105,
122, 128, 169, 170		114, 120, 126, 133
\@tempboxa . . . . .	281,	\al@mode . . . . . 12, 13,
282, 289, 290, 292		14, 15, 83, 108,
\@toodeep . . . . .	211	145, 150, 171, 177
\@topsep . . . . .	247	\al@mode@fullvoc . . . . .
\@totalleftmargin . . . . .	228, 229, 230	. . . . . 19, 90, 116
\@trivlist . . . . .	223	\al@mode@novoc . . . . .
		. . . . . 20, 95, 122
		\al@mode@trans . . . . .
		. . . . . 21, 100,
		128, 150, 171, 177
		\al@mode@voc 18, 85, 110
		\al@tatweel . . . . . 161, 170
		\al@trans@convention
		. . . . . 64, 65, 103, 131
		\al@trans@font . . . . .
		. . . . . 60, 61, 78
		\al@trans@style . . . . .
		. . . . . 62, 63, 101, 129
		\al@verse@stroke . . . . .
		. . . . . 158, 174
		<i>Amiri</i> . . . . . 5
		amiri (package) . . . . . 5
		arab (environment) 7, <u>108</u>
		<i>ArabTeX</i> . . . . . 3, 20
		<i>Arabic-English Lexicon</i> ,
		<i>An</i> . . . . . 18
		\arabicfont . . . . .
		. . . . . 34, 35, 37,
		76, 82, 86, 91,
		96, 112, 118, 124
		arabluatex (package) . . . . .
		. . . . . 2, 4–8, 10–
		13, 15–18, 20,
		24–26, 28, 30–
		39, 42–44, 46, 47
		arabtex (package) . . . . .
		. . . . . 3, 4, 15, 20, 44
		arabulatex (package) . . . . . 16
		arabverse (environ-
		ment) . . . . . 26, <u>135</u>
		arabxetex (package) . . . . . 4, 15
		\arb 7, <u>83</u> , <u>141</u> , <u>155</u> , <u>158</u>
		\arb@utf . . . . . 154,
		162, 178, 180, 182
		\arbnul . . . . . 23, <u>193</u>
		\arbup . . . . . 32, <u>66</u>
		\ArbUpDflt . . . . . 32, <u>66</u>
		<b>B</b>
		babel (package) . . . . . 42
		babel-french (package) . . . . . 42
		\baselineskip . . . . . 146
		\bayt . . . . . 26, <u>154</u>
		bidi (package) . . . . . 53
		\BODY 113, 119, 125, 130
		\boolfalse . . . . . 39
		\booltrue . . . . . 38,
		81, 111, 117, 123
		\box . . . . . 265, 290
		Brockelmann, Carl . . . . .
		. . . . . 10, 31, 32
<b>A</b>		
\abjad . . . . .	24, <u>185</u>	
\abraces . . . . .	30, <u>194</u>	
\addpenalty . . . . .	246, 251	
\addvspace 247, 248, 252		

<b>C</b>		<code>\hspace</code> 286, 287, 288, 294	<code>\leavevmode</code> ..... 158
<code>\Cap</code> ..... 74		<code>\hspace</code> ..... 166, 172	<code>\leftmargin</code> .. 227, 229
<code>\cap</code> ..... 31, 72, 74			<code>lineno</code> (package) ..... 28
<code>\centering</code> ..... 149	<b>I</b>		<code>\linewidth</code> 226, 227, 230
<code>\clubpenalty</code> .. 270, 272	<code>\if@inlabel</code> .. 236, 259		<code>\list</code> ..... 209
<code>\color@endgroup</code> ... 297	<code>\if@newlist</code> ..... 242		<code>\listparindent</code> 216, 225
<code>\color@setgroup</code> ... 297	<code>\if@nmbrrlist</code> ..... 277		<code>\long</code> ..... 296
<code>csquotes</code> (package) ... 42	<code>\if@nobreak</code> .. 243, 268		<code>\LR</code> .... 38, 40, 146,
	<code>\if@noitemarg</code> ..... 275		198, 200, 203, 205
<b>D</b>	<code>\if@noparitem</code> ..... 233		<code>\LRfootnote</code> ... 38, 197
<code>\DeclareOption</code> ....	<code>\ifal@verse@delim</code> . 164		<code>\LRmarginpar</code> ... 39, 196
.... 12, 13, 14, 15	<code>\ifal@verse@utf</code> 151, 155		<code>luabidi</code> (package) ... 4, 45
<code>\deffootnote</code> .. 203, 205	<code>\ifbool</code> .. 228, 281, 283		<code>\luadirect</code> 32, 33, 73,
<code>\define@boolkey</code> 142, 143	<code>\IfBooleanTF</code> .... 53, 57		87, 92, 97, 102,
<code>\define@choicekey</code> . 144	<code>\ifdim</code> ..... 289		113, 119, 125,
<code>\define@key</code> 139, 140, 141	<code>\ifhmode</code> ..... 239		130, 188, 191, 195
<code>delim</code> (option) ..... 26	<code>\ifluatex</code> ..... 5		<code>luaotfload</code> (package) ... 31
	<code>\IfNoValueTF</code> ..... 163		<code>\luastringN</code> .... 73,
<b>E</b>	<code>\ifnum</code> ..... 210		87, 92, 97, 102, 195
environments:	<code>\ifvoid</code> ..... 262		<code>\luastringO</code> .....
<code>arab</code> ..... 7, 108	<code>\ignorespaces</code> . 231, 295		... 88, 93, 98,
<code>arabverse</code> .. 26, 135	<code>\indent</code> ..... 237		103, 104, 105,
<code>txarab</code> ..... 37, 79	<i>Information and Docu-</i>		113, 114, 119,
<code>\everypar</code> .... 256, 273	<i>mentation - Ro-</i>		120, 125, 126,
<code>\ExecuteOptions</code> .... 16	<i>manization of</i>		130, 131, 132, 133
	<i>the Arabic Al-</i>		
<b>F</b>	<i>phabet for Ara-</i>	<b>M</b>	
<code>\FixArbFtnmk</code> ... 39, 201	<i>bic, Ottoman-</i>	<code>\makebox</code> . 164, 174, 180	
<code>fontspec</code> (package) ...	<i>Turkish, Per-</i>	<code>\makelabel</code> 220, 281, 282	
..... 5, 31, 46	<i>sian, Kur-</i>	<code>\marginpar</code> ..... 196	
<code>footnote</code> (package) .... 28	<i>dish, Urdu and</i>	<code>metre</code> (option) ..... 26	
<code>\footnote</code> .... 198, 200	<i>Pushto</i> ..... 10	<code>mode</code> (option) ..... 26	
<code>footnotehyper</code> (package) 28	<i>Introduction to Arabic</i>		
<code>fullvoc</code> (option) .... 5, 8	<i>Natural Lan-</i>	<b>N</b>	
	<i>guage Process-</i>	<code>\newbool</code> ..... 31	
<b>G</b>	<i>ing</i> ..... 35	<code>\NewDocumentEnvironment</code>	
<code>\global</code> ... 213, 254,	<code>\itemindent</code> 217, 263, 286	..... 79, 148	
258, 260, 283, 284	<code>\itemsep</code> ..... 252	<code>\NewEnviron</code> ..... 108	
<i>Grammar of the Arabic</i>	<code>\itshape</code> ..... 62	<code>\newfontfamily</code> ..... 37	
<i>Language, A</i> 5–		<code>\newlength</code> ... 135, 136	
7, 9, 12–18, 24, 25	<b>K</b>	<code>\NoArbUp</code> ..... 32, 66	
<code>gutter</code> (option) ..... 26	<code>\kern</code> ..... 158, 263	<code>\noindent</code> ..... 149	
	<code>KOMA-script</code> (package) 39	<code>novoc</code> (option) ..... 5, 8	
<b>H</b>			
<code>Habash, Nizar Y.</code> .... 35	<b>L</b>	<b>O</b>	
<code>\hbox</code> ..... 158,	<code>\labelsep</code> .... 288, 294	options:	
283, 284, 292, 296	<code>\labelwidth</code> 287, 289, 292	<code>delim</code> ..... 26	
<code>\Height</code> .. 162, 178, 182	<code>Lagally, Klaus</code> .... 3, 20	<code>fullvoc</code> ..... 5, 8	
<code>\hfill</code> ..... 153, 158	<code>Lane, Edward William</code> . 18	<code>gutter</code> ..... 26	
<code>Hosny, Khaled</code> ..... 5	<code>\lastbox</code> ..... 261	<code>metre</code> ..... 26	



