Poorman's Hangul Jamo Input Method
`pmhanguljamo.sty`

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Contents

1 Introduction

This LaTeX package provides Hangul[1] *transliteration* input method, which allows to typeset Korean Letters (Hangul) with the help of proper fonts. The name comes from "Poorman's Hangul Jamo Input Method." It is mainly for the people who have a system without Korean keyboard IM, but want to typeset Hangul in their

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[1] *Hangul* is the Korean alphabet to write the Korean language. In both South and North Korea, the standard writing system uses Hangul.

document. Not only modern Hangul, but so-colled "Old Hangul" characters that uses the lost letters such as 'Arae-A'(ᆞ), 'Yet Ieung'(ㆁ) or 'Pan-Sios'(ㅿ) etc. can also be typeset.

X∃LATEX or LuaLATEX is required. The legacy pdfTEX is not supported. The Korean Language supporting packages such as xetexko and luatexko (in the ko.TEX bundle) or polyglossia package with Korean support are recommended, but without them typesetting Hangul is of no problem with this package pmhanguljamo.

2 Usage

2.1 Loading the package

Put the following line in your preamble:

`\usepackage[<options>]{pmhanguljamo}`

1. `[rrk]` or `[RRK]`. The *Standard Korean Romanization Transliteration* input method is activated. In section 6, we will explain about it. If this option is missing, the default input method is used, which is explained in sections 3– 5. You are to specify just one of them. Using both methods in one document is not allowed.

2. `pmfont=<fontname>`. The font that is used to typeset Hangul characters in the scope of \jamoword or jamotext. If this option missing, the Jamo-Hangul font is to be same as the *main font* of the document.

3. `pmfontfeature=<fontfeature>`. It is possible to provide *font features* to the font selected as `pmfont`.

2.2 Commands and Environment Provided

The main command to typeset Hangul is `\jamoword`.

> Input: `\jamoword{han/gvr/vi yeis i/rvm/vn hun/min/jex/vm/i/da/.}`
> Result: 한글의 옛 이름은 훈민정음이다.

The argument of the command consists of roman alphabets and a few marks that represent Hangul Jamo. The transliteration rule will be explained in the section 3, page 5.

And an environment named *jamotext* is provided. In the environment, multiple paragraphs can be located. So, it is suitable to typeset longer text stuffs. For example,

```
\begin{jamotext}
jug/nvn nar/gga/ji ha/nvr/vr u/re/re \\
han jem bu/ggv/rem ebs/gi/rvr

ip/sai/ei i/nvn ba/ram/ei/do \\
na/nvn goi/ro/ue/haiss/da/.
\end{jamotext}
```

Result:

죽는 날까지 하늘을 우러러
한 점 부끄럼 없기를

잎새에 이는 바람에도
나는 괴로워했다.

ASCII-Escaping Trick Sometimes it is needed to locate a few math materials or ASCII stuffs in the midst of Jamo Hangul texts. The tricky syntax

```
!{<ASCII stuffs>}
```

makes it possible to insert non-Jamo ASCII characters into `jamotext` context. Note that it is not allowed in the arguments of `\jamoword`.

```
\begin{jamotext}
in/gan/i pog/jex/goa eg/ab/ei
!{tyranny and oppression}
dai/hax/ha/nvn ma/ji/mag su/dan/v/ro/se
!{as a last resort}
ban/ran/vr ir/v/ki/do/rog gax/yo/bad/ji
anh/v/rye/myen

pi/ta/go/ra/sv/vi jex/ri/ !{\unskip :}
!{$a^2+b^2=c^2$}.
\end{jamotext}
```

Result:
인간이 폭정과 억압에 tyranny and oppression 대항하는 마지막 수단으로서 as a last resort 반란을 일으키도록 강요받지 않으려면
     피타고라스의 정리: $a^2 + b^2 = c^2$.

The `!{` mark must be located in the head of a word. To remove the preceding space of a word, `\unskip` is used in the example. This trick will be useful when using math equations, LaTeX macros, or English words along with long Jamo Hangul texts.

2.3 Setting up in your Preamble

Without any other packages, you can type Hangul. Be sure that proper fonts should be declared for Hangul, utilizing fontspec.

```
\usepackage{fontspec}
\usepackage[pmfont={Noto Serif KR}]{pmhanguljamo}
```

```
\jamoword{an/nyex/ha/sei/yo}
```

<div align="center">안녕하세요</div>

If you don't want to specify `pmfont` option, you should manually declare the proper font for Jamo Hangul with `Script=Hangul` option.[2]

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[2]See section 4.

```
\usepackage{fontspec}
\usepackage{pmhanguljamo}
\newfontfamily\mypmfont{Noto Serif KR}[Script=Hangul]
```

```
\mypmfont\jamoword{an/nyex/ha/sei/yo}
```

<div align="center">안녕하세요</div>

Not all Korean fonts are available to typeset so-called 'Old Hangul', because they happen to lack the feature of composing Korean syllables from conjoining Jamo codes. Fortunately, we have a few more fonts besides UnBatang that are *proper* and freely available, which are listed in the section 4. In TeX Live distribution, UnBatang is the only *proper* one.

The polyglossia package provides Korean language support. pmhanguljamo can be used with it. The following is an example.

```
\usepackage{polyglossia}
\setmainlanguage{english}
\setotherlanguage{korean}
\newfontfamily\hangulfont{Noto Serif KR}[Script=Hangul]
\usepackage{pmhanguljamo}
```

```
\begin{korean}
\jamoword{a/rvm/da/un han/gvr/ib/ni/da/.}
\end{korean}
```

<div align="center">아름다운 한글입니다.</div>

In this example, the Korean language is set as 'other language', and the default font for Korean is declared as '\hangulfont'. In the *korean* environment, the \hangulfont will be used for Hangul.

Or the ko.TeX package bundle can be used together.

```
\usepackage{kotex}
\usepackage[pmfont={NotoSerifKR-Regular.otf}]{pmhanguljamo}
```

```
\jamoword{na/ras/mar/ss@/mi}
```

<div align="center">나랏말싸미</div>

When ko.TeX is used, the fontspec command for Hangul is not \fontspec but \hangulfontspec. We recommend that you use pmfont= option to avoid the complicated situation.

The Korean writing system does not have hyphenation rules. The line breaking can occur just after almost every syllable. Therefore, without Korean language supporting packages the line breaking and justification of paragraphs will not be satisfactory. However when just single or a few Hangul characters are needed, for example in the case of typesetting the author's name in Hangul, this package provides a casual way to print them out.

3 Transliteration Rule of This Package

3.1 Tone Marks and Syllable Serapator

This package assumes that every Hangul syllable has *Tone Mark* which must be explicitly put at the end of it. Table 1 shows the input scheme of them.

Table 1: Tone Marks

input	description
/	for *PyeongSeong*, no dot
;	for *GeoSeong*, single dot on the left of a character, [U+302E]
:	for *SangSeong*, double dots on the left of a character, [U+302F]

The tone marks were used in the 15th century, but in the modern Korean they are out of use. Nevertheless the / mark in this package is also used in order to depict the completion of composing a syllable — i.e., syllable separator. So DO NOT miss it.

However, it is possible to omit '/' mark at the end of a word, i.e., just before `<space>`, or at the end of the argument of `\jamoword`. Note that before the puctuation mark — period, comma, etc., omitting / is not permitted.

3.2 Consonants

Table 2 shows the transliteration rule for the consonants which are used in the leading and trailing position of a syllable.

Table 2: Consonants

ㄱ	g	ㄴ	n	ㄷ	d	ㄹ	r
ㅁ	m	ㅂ	b	ㅅ	s	ㅇ	x
ㅈ	j	ㅊ	c	ㅋ	k	ㅌ	t
ㅍ	p	ㅎ	h	ㆆ	q	ㅿ	z
ㆆ	f		w				

1. The corresponding letters "g, n, d, m, b, s, j, k, t, p, h" are the same as Korean Romanization Method (RRK).[3]

2. The letter for 'ㄹ' is allocated to r not l. The latter is reserved for another purpose, cf. item 7.

3. The letter 'c' is for 'ㅊ'. In the RRK, it is 'ch' there.

4. The letter for 'ㅇ' is x, which is a bit strange, but commonly accepted 'ng' was not to be chosen. It is reserved for another consonant 'ㆁ'

5. The letters 'q, z, f' are more freely selected. These letters are the lost ones in Modern Korean.

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[3]The *Revised Romanization of Korean* 1995:2000 is the official Korean language romanization system in South Korea.

6. The 'light labial consonants', ㅸ, ㆄ in the Old Hangul can be input as 'bx, px, bbx, mx'.

7. The letters 'l' and 'lr' are prepared for very rare case. In the 15th century Korean, 'ᄼ' and 'ᄾ' were distinguishable. 'sl' is chosen for the SIOS with left branch being longer, and 'slr' means right branch longer. The same is the case 'ssl', 'sslr', 'jl', 'jlr' etc.

8. In the Modern Korean, only 'gg, dd, bb, ss, jj' are additionally permitted in the leading consonant position, But in the Old Hangul this limitation was not applied. So *Choseong* can have multiple consonants, e.g., 'bsg', 'bsd', 'ss', 'sd' etc.

9. The leading 'zero consonant' can be omitted. So if a syllable begins with vowel, then the leading 'ㅇ' will appear. You can write the leading 'x' of a syllable or not. For example, '\jamoword{xax}' and '\jamoword{ax}' will generate the same result '앙'.

10. The letter 'w' is chosen to present *Choseong Filler*. For example, \jamoword{wan} renders ᅟᅡ.

3.3 Vowels

Table 3 shows the transliteration rule for vowels.

Table 3: Vowels

ㅏ	a	ㅓ	e	ㅗ	o	ㅜ	u	ㅡ	v
ㅣ	i	·	@						
ㅑ	ya	ㅕ	ye	ㅛ	yo	ㅠ	yu	ᐧᐧ	@@
ㅐ	ay, ai	ㅔ	ey, ei	ㅚ	oy, oi	ㅟ	uy, ui	ㅢ	vy, vi
ㅒ	yay, yai	ㅖ	yey, yei	ㆉ	yoi	ㆌ	yui	ᆡ	@i
ㅘ	oa	ㅙ	oay, oai	ㅝ	ue	ㅞ	uey, uei		*

1. The rule for vowels may look a bit unfamiliar. But it is simple and easily rememberable.

2. The letter 'v' is never considered to be a vowel. But this package determined it to stand for the vowel 'ㅡ'. In fact, the roman alphabets fall short of the vowels. This allocation is arbitrary.

3. The lost 'Arae-A' is allocated to '@', and the rare 'Double Arae-A' to '@@', which are forgotten vowels in Modern Korean.

4. The *Jungseong Filler* ([U+1160]) can be input with *. For example, \jamoword{h*n} renders ᄒᆫ.

3.4 Compatibility Jamos

The compatibility Jamo block in Unicode contains several Hangul Jamo characters, which cannot be used to compose Hangul syllables, and are considered independent Jamo characters respectively.

To input the compatibility Jamos in the arguments of \jamoword or jamotext, you are to type them in their capital letters (upper cases). And every compatibility Jamo has to be separated with syllable separator — /. Because the @ character has no upper case, write W instead of @ to display compatibility 'Arae-A'.

Here is an example:

```
\jamoword{W/nvn a/rai/a/ra/go bu/rv/go A/oa
    bi/svs/ha/gei irg/nvn/da}
```

ㆍ 는 아래아라고 부르고 ㅏ 와 비슷하게 읽는다

4 Proper Fonts

In order to typeset Hangul characters successfully with the input method of this package, the help of the *proper* font is crucial. What we call *proper* font is the font that has the Opentype feature of 'Script Hangul', that is, the feature of conjoining jamo characters. A Truetype font may have this Opentype feature. Otherwise, it is regarded as an *improper* font.

Not so many fonts are *proper*. The fonts or font families listed in the following lines are what we know *proper*. They can be downloaded from the url and used freely. And note that UnBatang is already installed in your TeX Live installation.

Hamchorom or Hamchorom-LVT Hamchorom fonts by Hancom Inc., https://www.hancom.com/cs_center/csDownload.do, and their variants with GSUB tables by KTS (the Korean TeX Society). https://github.com/dohyunkim/hcr-lvt

KoPub World free fonts by Korea Publisher Society. https://www.kopus.org/biz-electronic-font2/.

Malgun Gothic One of Windows 10 system fonts.

Nanum Yet Hangul Two font families from Naver. Nanum Myeongjo Yet Hangeul and Nanum Barun Gothic Yet Hangeul. https://hangeul.naver.com/2014/archaicword

Noto Korean or Source Han Google's Noto Korean fonts — Noto Serif Korean, Noto Sans Korean. Or Adobe's Source Han fonts. https://fonts.google.com.

Un Batang UnBatang.ttf. on CTAN. https://ctan.org/pkg/unfonts-core

To use one of these fonts, do not forget to provide the [Script=Hangul] option.[4] For example, you can specify Hamchorom Batang LVT font as:

\newfontfamily\pmjamofont{HCR Batang LVT}[Script=Hangul]

---

[4]the option should be
[Script=Hangul,Renderer=Harfbuzz]
or
[Script=Hangul,Renderer=OpenType],
when the document is processed with LuaLaTeX.

and then issue \pmjamofont command in the scope of Hangul to be typeset.[5] It is recommended that the *proper* font should be used consistently.

In case the font you take is not *proper*, you are to meet the warning message at the console and log file,

```
 Package fontspec Warning: (fontspec)
 Font "batang" does not contain requested Script "Hangul".
```

However, when X⫸LATEX is concerned, it is known that the *Modern* Korean Characters (*Hangul Precomposed Syllables* in the Unicode block [U+AC00] – [U+D7A3]) can be rendered with this kind of font, in spite of the warning message.

5   Examples

Now, we will show a few practical examples, where the *korean* environment of polyglossia package is used. The preamble is like this:

```
\usepackage{pmhanguljamo}
\usepackage{polyglossia}
\setotherlanguage{korean}
\newfontfamily\hangulfont{Noto Serif KR}[Script=Hangul]
```

5.1   Modern Hangul

```
\begin{verse}
\begin{korean}
\begin{jamotext}
na bo/gi/ga yeg/gye/ue \\
ga/sir ddai/ei/nvn \\
mar ebs/i go/i bo/nai dv/ri/u/ri/da/.

yex/byen/ei yag/san \\
jin/dar/rai ggoc \\
a/rvm dda/da ga/sir gir/ei bbu/ri/u/ri/da/.

ga/si/nvn ger/vm ger/vm \\
noh/in gv ggoc/vr \\
sa/bbun/hi jv/rye/barb/go ga/si/ob/so/se

na bo/gi/ga yeg/gye/ue \\
ga/sir ddai/ei/nvn \\
jug/e/do a/ni nun/mur hvr/ri/u/ri/da/.
\end{jamotext}
\end{korean}
\end{verse}
```

> 나 보기가 역겨워
> 가실 때에는

---

[5]When `pmfont=` option is given, the `Script=Hangul` is automatically activated by the package.

말 없이 고이 보내 드리우리다.

영변에 약산
진달래 꽃
아름 따다 가실 길에 뿌리우리다.

가시는 걸음 걸음
놓인 그 꽃을
사뿐히 즈려밟고 가시옵소서

나 보기가 역겨워
가실 때에는
죽어도 아니 눈물 흘리우리다.

5.2 pre-1933 Hangul

A 15th century text with tone marks (*BangJeom*).

```
\begin{korean}
\begin{jamotext}
na/ras;mar:ss@/mi;
中dyuq/國guig;ei; dar/a;
文mun/字jj@x;oa;ro; se/rv/ s@/m@s/di; a/ni;h@r/ss@i;
i;ren jyen/c@;ro; e/rin; 百b@ig;姓syeq;i;
ni/rv/go;jye; horf; bai; i/sye;do;
m@/c@m;nai: jei bdv;dvr; si;re; pye/di; mod:h@rf no;mi; ha/ni;ra;
\end{jamotext}
\end{korean}
```

　　나·랏:말ᄊᆞ·미 中듕國·귁·에 달·아 文문字·ᄍᆞ·와·로 서르 ᄉᆞᄆᆞᆺ·디 아·니ᄒᆞᆯ
　　·ᄊᆡ ·이런 젼·ᄎᆞ·로 어·린 百·ᄇᆡᆨ姓·셩·이 니르·고·져 ·홇 ·배 이·셔·도 ᄆᆞ·ᄎᆞᆷ
　　:내 제 ·ᄠᅳ·들 시·러 펴·디 :몯ᄒᆞᇙ ·노·미 하·니라

　　And another example of 17th century, from 두시언해, *Selected Translations of Du Fu's Poems*, without tone marks.

```
\begin{verse}
\begin{korean}
\begin{jamotext}
g@/r@/mi p@/r@/ni sai de/ug h@i/o/,\\
moy/hi pe/re/h@/ni gos/ bi/ci bvr bvd/n@n d@s/do/da/.\\
ors bo/mi bon/d@in sdo di/na/ga/n@/ni \\
e/nv na/ri i do/ra/gar h@i/o/.
\end{jamotext}
\end{korean}
\end{verse}
```

　　ᄀᆞᄅᆞ미 프르니 새 더욱 희오,
　　뫼히 퍼러ᄒᆞ니 곳 비치 블 븓는 ᄃᆞ도다.
　　옰 보미 본ᄃᆡᆫ ᄯᅩ 디나가ᄂᆞ니
　　어느 나리 이 도라갈 희오.

6 The RRK Input Method: An Alternative Way

In chapter 3 section 8 of *Revised Romanization of Korean* (2000), the 'transliteration method' of Hangul romanization is declared. It is exceptionally permitted when it is required to restore the original Hangul writings, while standard is the phonetic transcription one. So we can make use of the former as an input method.

If the package option `[RRK]` or `[rrk]` is given, the RRK method is activated. With this method, only 'Modern Hangul' can be typeset.

6.1 Transliteration Rule of RRK

Table 4 and 5 show the RRK transliteration rule.

Table 4: RRK Consonants

ㄱ	g	ㄲ	kk	ㅋ	k	ㄷ	d	ㄸ	tt	ㅌ	t
ㅂ	b	ㅃ	pp	ㅍ	p	ㅈ	j	ㅉ	jj	ㅊ	ch
ㅅ	s	ㅆ	ss	ㅎ	h						
ㄴ	n	ㅁ	m	ㅇ	ng	ㄹ	l				

Table 5: RRK Vowels

ㅏ	a	ㅓ	eo	ㅗ	o	ㅜ	u	ㅡ	eu	ㅣ	i
ㅐ	ae	ㅔ	e	ㅚ	oe	ㅟ	wi				
ㅑ	ya	ㅕ	yeo	ㅛ	yo	ㅠ	yu	ㅒ	yae	ㅖ	ye
ㅘ	wa	ㅙ	wae	ㅝ	wo	ㅞ	we	ㅢ	ui		

1. When the leading consonant 'ㅇ' is placed at the head of a word, it can be ommitted. Otherwise the hyphen character (-) should exist. For example,
   `\jamoword{annyeonghase-yo}` 안녕하세요
   `\jamoword{jung-ang jungang}` 중앙 준강
   `\jamoword{ha-yeossseubnida}` 하였습니다

2. The hyphen character - can also be used to forcibly separate syllables. And the special character / is taken as another syllable separator. They are exchangeable.
   `\jamoword{haeb/ssal haeb-ssal}` 햅쌀 햅쌀

3. The six pucntuation marks, . , ! ? ; : can be located in the Hangul scope. The others are not allowed.
   `\jamoword{a! malg-eun haneul, si-wonhan baram.}`
   아! 맑은 하늘, 시원한 바람.
   The LaTeX quotes, ``` `` ```, `''`, `` ` `` and `'` cannot be used within Hangul input scope. They should be located outside. However you can use unicode quotes, " and ", which can be input with syllable separator. For example,
   `\jamoword{"/hangeul/"/ilan hangug-eoleul jeogneun geul-ida.}`
   "한글"이란 한국어를 적는 글이다.
   In this case, the syllable separator / cannot be replaced by hyphen character.

4. The leading consonant '르' is written with either l or r, while the trailing one should be l.

   `\jamoword{noraereul nolaeleul}` 노래를 노래를

5. We made it possible to use 'Arae-A' with the RRK method. Though it is not present in Modern Hangul writing system, typesetting 'Jeju language' or some pre-1933 Korean texts will be made easy with this. The 'Arae-A' is to be input as '@' character, and the 'Double Arae-A' '@@'. There is one exception. The one word with one letter that has only leading '@', i.e., 오 should be input by 'x@'. If the syllable has trailing consonants or is part of a word, just @ is good.

   `\jamoword{h@ngeul @@nam-eun}` 훈글 오남은.

6.2 Example of RRK method

The text is one of the most famous poem in Korean, 진달래꽃 *Azalea* by Kim So-wol.[6] In section 5.1, we showed default way of inputting the poem. The *korean* environment and font settings are the same as in section 5.

```
\begin{verse}
\begin{korean}
\begin{jamotext}
na bogiga yeoggyeo-wo \\
gasil ttae-eneun \\
mal eobs-i go-i bonae deuli-ulida.

yeongbyeon-e yagsan \\
jindallae kkoch \\
aleum ttada gasil gil-e ppuli-ulida.

gasineun geol-eum geol-eum \\
noh-in geu kkoch-eul \\
sappunhi jeulyeobalbgo gasi-obsoseo

na bogiga yeoggyeo-wo \\
gasil ttae-eneun \\
jug-eodo ani nunmul heulli-ulida.
\end{jamotext}
\end{korean}
\end{verse}
```

나 보기가 역겨워
가실 때에는
말 없이 고이 보내 드리우리다.

영변에 약산
진달래 꽃
아름 따다 가실 길에 뿌리우리다.

가시는 걸음 걸음

---

[6]An English translation of this poem can be read in Wikipedia, https://en.wikipedia.org/wiki/Kim_Sowol.

놓인 그 꽃을
사뿐히 즈려밟고 가시옵소서

나 보기가 역겨워
가실 때에는
죽어도 아니 눈물 흘리우리다.

7   Further Information

For more examples and information about this package, please read the documentation `pmhanguljamo-kdoc.pdf` (in Korean).

8   Acknowledgements

Thanks go to yihoze at the KTUG board, there he commented, "The IM apps I've tried such as Korean Windows Old Hangul IM or Saenaru IM were all somewhat inconvenient. . . . In my opinion, for the foreign scholar who studies Korean language, especially Middle Age Korean language, this kind of transliteration method may be much more convenient and confident way of typesetting Korean than the keyboard IM solutions."[7]

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[7]`http://www.ktug.org/xe/index.php?mid=KTUG_open_board&document_srl=240134`