

Typesetting Bengali in Ω using Velthuis Transliteration or Unicode Text

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1 Introduction

Unicode is the new standard to represent all the languages in the world. Velthuis scheme has been used widely to type Sanskrit texts. Using the *Bengali-Omega for T_EX* (Bengali) package, you can type Bengali using Velthuis transliteration scheme, or Unicode text directly. For Unicode text, you must have a text editor which can type Unicode Bengali. Notepad under Windows XP or Microsoft word under Windows XP or free text editor Yudit can be used.

Easiest is to use the transliteration method to write your Bengali. You can use any text editor to type your code, and then save the file as a text-file. In this tex file, you should have a line in the preamble of the document (i.e., between the line

```
\documentclass[....
```

at the top your text document and the line

```
\begin{document}) a few lines later) the following command:
```

```
\usepackage{obeng}
```

You can use bengali tex tags as follows:

```
{\bengali and type your transliterated text} e.g.,  
{\bengali aami baa.mlal bhaalobaasi.}
```

When you process this document it will produce আমি বাংলা ভালোবাসি।

To use unicode Bengali text together with English text, you have to use a unicode enabled text editor such as Microsoft Word under Windows XP or Notepad under Windows XP, and then type you texts including any tex formatting command and then save the document as an utf-8 text document.

The bengali part of the unicode document should have the tex tag in any of the following two forms:

```
\beng or {\beng your text...}
```

You also need to add the following line in the preamble of the tex document:

```
\usepackage{beng-uni}
```

If you use the first tag, everything following this command will be treated as Unicode Bengali. In the second case, only the text within the bengali tag delimited by the curly bracket `{}` will be treated as Bengali Unicode text. Outside this tag the text will be treated as English.

The advantage of this bengali-omega package over the existing Bengali-tex packages: I tried to make inputting of Bengali standardized to Velthuis transliteration scheme so that there are not many different schemes that one has to remember for typing Bengali or Hindi. Second advantage is that you do not have to run any preprocessor. You directly process the input file. Third advantage is that you are able to use Unicode Text directly in your tex document.

You do not need any intermediate preprocessor to transform your document to a Tex document as for instance is the case with Bengali Latex package of Ansuman Pandey. He used Velthuis transliteration scheme except for a few letters. Palash Baran Pal also has an excellent bengali tex package which uses similar transliteration scheme, but the commands are not standardized. This is the first tex-package that can read bengali directly from a unicode text file, which is the main contribution of the omega extension of the Donald Knuth's Tex processing engine by Yannis Haralambous and John Plaice.

To process your document say `exampleV.tex` with either type or both types of text, you type at the dos prompt `"lambda exampleV"`. This will create a dvi file `exampleV.dvi` which you can view and print. If you want to create a pdf file, type

```
dvipdfm exampleV
```

2 Transliteration scheme

You must consult these tables to be familiarized with what english letters represent what bengali letters. The general rule is simple: To type কি which is ka + i, you drop the letter a after k, and then type the letter i, i.e. type ki (i is for independent vowel ঐ). By doing that you have combined those two bengali letters. Similarly, to type কা you drop the letter a after k and aa (aa is for independent vowel আ, see the transliteration chart). There is one important exception. Suppose you want to type বই if you type bai the

last two letters will be treated as the vowel ai. So to break this symbiotic relationship between a and i you have to use a curly brackets like this ba{}i. This applies in other situations as well.

How to get যুক্তবর্ণ: If you write two consonants together without the letter a between them, then those two consonants will be treated as যুক্তবর্ণ. For instance if you like to combine ka + ta you type kta. The letter a breaks their conjunction. Thus kta becomes one jukta barna. You can treat it like any other consonant. If you want ক্তি you again drop the letter a from kta and add i like this kti. Now you are all set to be a Bengali writer in the tradition of Vidyasagar, Bankim Chandra, Sarat Chandra and Tagore.

<i>Vowels</i>					
a	অ	aa	আ	i	ঈ
u	উ	uu	ঊ	.r	ঋ
ai		o	ও	au	ঔ
oi*				ou*	ঔ

Note * is an alternate key, not present in the Velthuis scheme. It is provided for your convenience. You may adhere to the Velthuis scheme throughout your document and avoid using the alterante keys.

<i>Consonants</i>					
ka	ক	kha	খ	ga	গ
ca	চ	cha	ছ	ja	জ
.ta	ট	.tha	ঠ	.da	ড
ta	ত	tha	থ	da	দ
pa	প	pha	ফ	ba	ব
				gha	ঘ
				jha	ঝ
				.dha	ঢ
				dha	ধ
				bha	ভ
				na	ন
				ma	ম
				"na	ঙ
				~na	ঞ
				.na	ণ

<i>Semi-vowels</i>					
ya	য	.ya	য়	ra	র
				la	ল
				ba	ব

<i>Sibilants</i>					
"sa	শ	.sa	ষ	sa	স

<i>Aspirate</i>	
ha	হ

<i>Flaps</i>	
Ra	ড়
Rha	ঢ়

Numerals									
0	০	1	১	2	২	3	৩	4	৪
5	৫	6	৬	7	৭	8	৮	9	৯

Assamese Variants	
~ra	va

Special Characters											
.m	ং	anusvāra	~m	ঁ	candrabindu	.h	ঃ	visarga	T	ৎ	khaṇḍa ta
		dāmṛī	/	ঁ	candrabindu	H	ঃ		.		dāmṛī

Note: ~m is an alternative for ঁ not in Velthuis scheme.

/	a	aa	i	ii	u	uu	.r	e	ai	o	au
k	ক	কা	কি	কী	কু	কূ	ক্	কে	কৈ	কো	কে
kh	খ	খা	খি	খী	খু	খূ	খ্	খে	খৈ	খো	খে
R	ড়	ড়া	ড়ি	ড়ী	ডু	ডূ	—	ড়ে	ডৈ	ডো	ড়ে
Rh	ঢ়	ঢ়া	ঢ়ি	ঢ়ী	ঢ়ু	ঢ়ূ	—	ঢ়ে	ঢ়ৈ	ঢ়ো	ঢ়ে

I am going to now write a personal example. Since I brought you this far, you may like to read the rest.

"nja	জ	k.sa	ফ	ncha	ছ	.s.na	ফ
stra	ত্র	k.sma	ক্ষ	n.dra	ড্র	hm	ন
"sra	শ্র	hla	ল্ল	jjba	জ্ব	mba	ষ
ktra	ত্র	hta	ত্ব	.t.ta	ট	.n.tha	ঠ

3 Example

গল্প নয়
- লক্ষ্মী কান্ত রাউৎ

আমার জন্ম পশ্চিম বঙ্গের এক গ্রামে। আমার গ্রামের নাম ধনেশ্বর পুর। অনেক কষ্টে আমার গ্রামের High School এ আমি পড়াশুনা করি। দু বছর আমাকে তিন মাইল হেঁটে স্কুলে যেতে হ'ত। একদিন প্রচণ্ড বর্ষা। মাঠে প্রচুর জল। মাঠের চারদিকে জলে ভরা জমির মধ্য দিয়ে একটা সরু রাস্তা দিয়ে স্কুলে যেতে হয়। আমি খুব হস্ত-দস্ত হয়ে এক মনে হেঁটে চলেছি স্কুলের যাতে না দেরি হয়ে যায়। হঠাৎ স-স-স-স শব্দ শুনে পিছন ফিরে দেখি, একটা কোব্রা সাপ তার মণি-ভূষন-ফণি তুলে আমাকে আলিঙ্গন করছে। প্রায় এক হাত দূর থেকে। এক মিনিট নিশ্বাস বন্ধ করে রইলাম দাঁড়িয়ে। তারপর কোনো দিকে না তাকিয়ে দিলাম ছুট। সেবারের মত বেঁচে গেছি।

If you are still curious, তার পর, তার পর... write to me. I will tell you the rest, which is very long. You may have to keep in touch with me for a long long time.

The above is obtained by doing the following: Create a file say exampleV.tex with the following text.

```
\documentclass[10pt]{article}
\usepackage{obeng}
\begin{document}
```

```
\begin{center}
{\Large \bengali galpa na.y}
```

```
{\bengali - lak.smii kaanta raa{ }uT}
\end{center}
```

```
{\bengali aamaar janma pa"scim banger ek graame. aamaar graamer naam
dhane"sbar pur. anek ka.s.te aamaar graamer } High School {\bengali e aami
paRaa"sunaa kari. du bachar aamaake tin maa{ }il he~m.te skule yete h't.
ekadin pracan.da bar.saa. maa.the pracur jal. maa.ther caaradike jale bharaa
jamir madhya di.ye eka.taa saru raastaa di.ye skule yete ha.y. aami khub
hanta-danta ha.ye ek mane he~m.te calechi skuler yaate naa deri ha.ye yaa.y.
h.thaaT sa-sa-sa-sa "sabda "sune pichan phire dekhi, eka.taa kobraa saap
taar ma.ni-bhU.san-pha.ni tule aamaake aalingan karache. praa.y ek haat dur
theke. ek mini.t ni"sbaas bandha kare ra{ }ilaam daa~mRi.ye. taarapar kono dike
naa taaki.ye dilaam chu.t. sebaarer mata be~mce gechi. }
```

If you are still curious, `{\bengali taar par, taar par}`... write to me. I will tell you the rest, which is very long. You may have to keep in touch with me for a long long time.

```
\end{document}
```

To process your document `exampleV.tex` using `lambda` typesetting, type the following command

```
lambda exampleV
```

This will produce a dvi file `exampleV.dvi` which you can view or print using a suitable dvi viewer that is included in your tex Package. To create a pdf file, type

```
dvipdfm exampleV
```

This will transform the dvi file into pdf file. Here is how the output will look like:

4 Obtaining and Installing the Package

4.1 Requirements

I have tested it on Windows XP operating system using MikTeX distribution. It should work under other systems as well. You can download and install the free MikTeX distribution. You need only [Download "Basic MiKTeX" Installer](#) (click on this link and choose a local mirror) from its main page: <http://www.miktex.org/2.5/Setup.aspx> (click on this link).

I assume that you have installed MikTeX on your system.

4.2 Where to Get It

The primary distribution site for the package is:

<http://www2.hawaii.edu/~lakshmi/software/bengali-omega> (you can click on the link)

4.3 Installation

1. unzip `bengali-omega.zip` file in a directory which will be a root directory. Then use MikTeX settings utility program (if you cannot find it, it is in the

```
R:\MiKTeX 2.5\miktex\bin
```


, called mo.exe where R is the root directory of your MikTeX installation (2.5 is the version number which might be different for your distribution. Once you run this program, you will see a window with menus. Choose the Roots tab, and add the root directory where you unzipped bengali-omega.zip.

2. At a dos-prompt, type "initexmf --edit-config-file updmap" it will show-up a file. In that file type

```
Map bang.map \fonts\map\Bangla\bang.map
```

Save the file. From the dos-prompt type "initexmf --mkmaps".

3. Go back to the mo.exe program, and click on the General tab, and then click on the tab Refresh FNDB.
4. To test your installation, go to the example directory of the bengali-omega installation and from the dos prompt type "lambda exampleV". This will create a exampleV.dvi file, which you can view or you can then issue the command "dvipdfm exampleV which will create a pdf file which you can view, print or share with your friends.

Send your comments and bug reports to rautsoft@yahoo.com or you can google my current email address.

Acknowledgements: This package uses the metafont files of Palash Baran Pal. and type-1 bang.pfb file.