Oriya-TEX

(*printed on 3/5/1998*)

Summary

This article gives an overview of the Oriya-TEX-package which can be used in combination with TEX for typesetting text in Oriya (ଓଡ଼ିଆ). Oriya-TEX can also be used in combination with other packages, to typeset mixed language documents. Oriya-TEX is part of a larger project to make all South Asian scripts available for TEX. The following South Asian scripts are now available as Metafonts: Devanagari (for Sanskrit, Prakrit, Hindi, Marathi, Nepali, Konkani), Gurumukhi (for Panjabi), Tamil, Malayalam, Telugu, Kannada, and Singhalese. Some of these packages need some refinement and adaption to LaTEX. The only important Indian scripts still missing are Gujarati and Bengali.

Jeroen Hellingman
Aletta Jacobsstraat 5
3404 XD IJsselstein
The Netherlands
telephone: +31 30 687 5444 (19:00–21:00 MET)
E-mail: `<jehe@kabelfoon.nl>`

Introduction

The Oriya script is used for the Oriya language and a few minority languages, such as Khondi and Santali, spoken in the state of Orissa in Eastern India. The Oriya language belongs to the Indic branch of the large Indo-European language family and is closely related to Bengali. It is spoken by about 30 million people, of them roughly the half can read and write.

The Oriya script forms a link between the South and North Indian scripts. The distinctive inner parts of some of the letters can be recognised when one knowns Devanagari and Bengali script, but the circular appearance reminds one of the curly South Indian scripts. The explanation for all those circles is easy: traditionally the script was written on palm-leaves with a sharp metal nib, and when one makes a horizontal top-line like in Devanagari on a palm-leave, it will tear. To avoid this, the top-lines where changed into the semi-circles which give Oriya its characteristic appearance—described by Nakanishi* as a parade of bald heads.

The Oriya alphabet follows the alphabetic order of Sanskrit. This order is based on phonetic principles. The vowels come first, in pairs of a short and long sound, those articulated in the back of the mouth first. After the 'pure' vowels come the 'diphtongs' (in Sanskrit, *e* and *o* are supposed to have been diphtongs originally).

ଅ *a*	ଆ *ā*	ଇ *i*	ଈ *ī*	ଉ *u*	ଊ *ū*
ଋ *ṛ*	ୠ *ṝ*	ଌ *ḷ*	ୡ *ḹ*		
ଏ *e*	ଐ *ai*	ଓ *o*	ଔ *au*		

Three vowel modifiers traditionally follow the vowels. These are ଅଁ *aṁ*, ଅଂ *aṃ*, and ଅଃ *aḥ*, which originally stood for a nasalisation, a following nasal, and a following aspiration respectively. In Oriya, ଃ *ḥ* is now used to indicated that the following consonant is doubled. Here written on the letter ଅ *a,* they can appear on any letter. The modifiers are followed by the consonants arranged in rows (called *varg*) of related sounds. The rows are ordered again by point of articulation, with semivowels and sibilants comming at the end, and in each row the voiceless sound first, followed by the aspirated, voiced, voiced and aspirated sound and the corresponding nasal.

କ *ka*	ଖ *kha*	ଗ *ga*	ଘ *gha*	ଙ *ṅa*
ଚ *ca*	ଛ *cha*	ଜ *ja*	ଝ *jha*	ଞ *ña*
ଟ *ṭa*	ଠ *ṭha*	ଡ *ḍa*	ଢ *ḍha*	ଣ *ṇa*
ତ *ta*	ଥ *tha*	ଦ *da*	ଧ *dha*	ନ *na*
ପ *pa*	ଫ *pha*	ବ *ba*	ଭ *bha*	ମ *ma*
ଯ *ya*	ୟ *ẏa*	ର *ra*	ଲ *la*	ୱ *va*
ଶ *śa*	ଷ *ṣa*	ସ *sa*		
ହ *ha*	ଳ *ḷa*		ଡ଼ *ṛa*	ଢ଼ *ṛha*

as shown in this table, all consonants are thought to be followed by the short letter ଅ *a.***

* Akira Nakanishi, *Writing Systems of the World,* p. 54

** The vowels ୠ, ଌ, and ୡ are not used in Oriya at all. They are borrowed from Sanskrit (and even in Sanskrit the last one is only introduced for symmetry), and are included in the alphabet for completeness. I've found only one reference to the corresponding vowel signs for these three vowels. The letter ୱ is a recent invention to distinguish the sound *va* from *ba* in loanwords. It is a combination of the vowel ଓ with a secondary ବ.

When a vowel follows a consonant, this is indicated by writing a special vowel sign, attached to the consonant. These vowel signs sometimes even stand before the consonant they apply to. Here the vowel signs are shown attached to the letter ଗ *ga*:

ଗ	ଗା	ଗି	ଗୀ	ଗୁ	ଗୂ
ga	*gā*	*gi*	*gī*	*gu*	*gū*
ଗୃ	ଗେ	ଗୈ	ଗୋ	ଗୌ	
gṛ	*ge*	*gai*	*go*	*gau*	

Vowel signs often combine with the consonant they apply to: The vowel sign for *ā,* ◌ା, is often joined to the letter, as in କା *ka.* The vowel sign for *i,* ◌ି, 'sinks' into the outer circle, for example in କି *ki*, and the vowel sign for *u,* ◌ୁ, can be written in one continuous stroke, as in କୁ *ku.* Sometimes the vowel sign for *u,* ◌ୁ, becomes ◌ୁ, for example in ଲୁ *lu.* On the letters ଥ *tha* and ଧ *dha*, the vowel sign for *i,* ◌ି, becomes a little hook ◌ି, written below the letter: ଥି *thi,* ଧି *dhi.* However, recent simplifications of the script have done away with all these irregular vowel signs.

When no vowel follows a consonant at all, not even the short ଅ *a,* this can be indicated with a sign called viram, ◌୍, for example, କ୍ *k.* However, this symbol is not used that often. It is normally omitted at the end of words.

When two or more consonants follow each other, they are combined into a consonant cluster or conjunct. Often these conjuncts consist of a smaller version of the second letter subscribed to the first letter, for example, ଶ୍ଚ *śca* is used for ଶ୍‌ଚ. Sometimes, the outer circle of the subscribed consonant is omitted, as in ଲ୍କ *lka* for ଲ୍‌କ. In many cases, however, the original consonants can hardly be recognised in the conjunct, for example in କ୍ଷ *kṣa* for କ୍‌ଷ. A fairly complete list of conjuncts is given as an appendix.

The letters ଯ *ya* and ର *ra* are treated in a special way. When ର *ra* is the first consonant of a cluster, it appears as the symbol reph ◌ର୍ at the end of the cluster, for example, ର୍ଣ୍ଣ *rṇṇa.* When it is the last in a cluster, it appears as a subscribed hook, ◌୍ର, for example in ପ୍ର *pra.* When the letter ଯ *y* is the last in a cluster, it appears as the symbol ◌୍ୟ, for example, କ୍ୟ *kya.* This same symbol ◌୍ୟ appears after the vowels ଏ *e* and ଓ *o* to modify their sounds.

The rules for combining consonants into conjuncts used to make typing and typesetting Oriya a very complicated business. Traditional Oriya typefaces in lead require several hundereds of different types. A computer, however, can easily apply all the rules, and make it possible to type only the base letters of Oriya in their phonetic order.

The spelling and the use of conjuncts is hardly standarized, and it is no exception to come across spelling variations even inside a single book.

Punctuation in Oriya script follows the English practice, except that the full stop is sometimes replaced by a standing bar ।, called *danda*, which is separated from the last word by a space to avoid confusion with the vowel sign for ଆ *ā*.

Finally, Oriya uses its own set of figures, ୧ ୨ ୩ ୪ ୫ ୬ ୭ ୮ ୯ ୦, although international figures are sometimes used as well.

How the Oriya fonts were made

To the typeface designer, Oriya script poses a big challenge: to create a font that, while it maintains the characteristic Oriyan appearance, is still easily readable and also economises the use of paper. To achieve this, the first most important issue is to find the proper proportion between the size of the circle and the size of the inner, distinctive features of each letter. Especially when drawing the letters in large size on a sheet of paper, one tends to make the circle far to large, and, when the design is reduced to the normal size of a letter the inner details have become so small as hardly visible. However, the larger one makes the inner part, the more difficult it becomes to draw a pleasing circle around it.

A second consideration is the extend to which vowel signs and secondary characters are allowed to stick below or above the letters, as this defines the necessary baseline distance, and also the texture of the printed page. Here, again, one should not be tempted to make the vowel signs and secondary characters to small, and one can often win much by using a ligature instead of the standard combination—although the number of ligatures that can be used is limited.

Because Oriya used to be written on palm-leaves, Oriya has little or no calligraphic tradition. One cannot produce thick-thin transitions, and other niceties with a metal nib. With the introduction of the printing press in India*, Oriya typefaces with thick-thin transistions were produced. However, these thick-thin transitions where not applied in a consistent way.

In this design, an attempt was made to add some calligraphic effects to the letters. After some trial and error, a 30 degree cut nib was found out to produce very acceptable results in most letters. Only in a few letters some little tricks, like using a second, much thinner pen, where required to make the result pleasing—notably in the diagonals of ୟ *ẏa*, ଷ *ṣa*, and କ୍ଷ *kṣa*.

When I started the design of this font, I decided to look at some old Oriya manuscripts first—which was easy, as the museum was just around the corner from my home in Ahmedabad—and started to make skeleton studies. I sketched the skeleton or 'essence' of the letter 25 millimetres high on graph paper. After this, I could easily read of the coordinates of the control points which I then coded in Metafont. Now, by giving the pen somwhat more 'body,' a more usable letter would appear. Then, by changing the pen from a circle to a slanted ellipse, a more calligraphic appearance was achieved. The illustration below demonstrates this for the letter କ *ka*:

On the left is the original skeleton, then comes the design drawn with a circular nib, which I named କଟକ *Cuttack*, after the (former) capital of Orissa, as it is supposed to be modern, and on the right is the design drawm with a elliptical nib, named କୋଣାର୍କ *Konark*, after the place where the famous sun temple is located.

Of course, the designs didn't come out right the first time. Every letter has gone through several iterations of the process of first a skeleton sketch, then a large size picture on the screen, and finally a try-out in running text on paper. The large circles can easily dominate the design, but the distinctive features of each letter need to be easily recognised. In my first designs, I made the inner features too small, which made reading text at small sizes difficult.

* The first printing in Oriya was probably done at the Serampore mission press in the early nineteenth century. In 1809 this press printed a complete bible in Oriya.—B.S. Kesavan, *History of Printing and Publishing in India,* Vol. I, p. 254

How to Use Oriya-TEX

A set of Oriya fonts alone doesn't make up an easy to use Oriya type-setting system. You will also need an easy way of typing Oriya text. The complex rules of Oriya script makes it cumbersome and error prone to type all required shapes directly. A computer can handle the composition and allow the user to type only the base characters in phonetic order. As the rules of Oriya composition are not build into TEX, a pre-processor will be used to accomplish this. As the name suggests, this pre-processor needs to be run on your file with Oriya text before TEX can handle it.

The pre-processor will accept standard TEX and LaTEX files, in which Oriya is typed in an ASCII based transcription scheme. This scheme is based on the scheme used by Frans Velthuis for Devanagari. The output is a file contains a lot of gibberish which you don't want to look at, but it will tell TEX how to typeset your Oriyan text.

Before you can start, you will have to load some macros. Users of plain TEXhave to input the file `ormacs.tex` somewhere at the start of their document. Users of LaTEX can simply use the package `oriya` to load the required macros and fonts. Oriya-TEX supports the new font selection scheme.

To enable the pre-processor to recognise transcribed Oriya text, you will have to enclose it in between the tags `<OR>` and `</OR>`. A special 'dollar-mode' is supplied for people who have to switch from Oriya to English constantly. When it is used, Oriya can also be enclosed between dollar signs. In this case, math has to be accessed with `<MATH>` and `</MATH>`.

The following table indicates how to type Oriya. The first collumn indicates the transcription typed, the second the Oriya letter output, and the third the scientific transcription. It should be noted that the scientific transcription is based on the model of Sanskrit, and does not give an exact indicatin of the actual pronunciation in Oriya.

`a`	ଅ or implicit	*a*	`ka`	କ	*ka*	`pa`	ପ	*pa*
`aa`	ଆ or ା	*ā*	`kha`	ଖ	*kha*	`pha, fa`	ଫ	*pha, fa*
`i`	ଇ or ି	*i*	`ga`	ଗ	*ga*	`ba, va`	ବ	*ba, va*
`ii`	ଈ or ୀ	*ī*	`gha`	ଘ	*gha*	`bha`	ଭ	*bha*
`u`	ଉ or ୁ	*u*	`"na`	ଙ	*ṅa*	`ma`	ମ	*ma*
`uu`	ଊ or ୂ	*ū*	`ca`	ଚ	*ca*	`ya`	ଯ	*ya*
`R`	ଋ or ୃ	*ṛ*	`cha`	ଛ	*cha*	`.ya`	ୟ	*ẏa*
`RR`	ୠ or ୄ	*ṝ*	`ja`	ଜ	*ja*	`ra`	ର	*ra*
`L`	ଌ or ୢ	*ḷ*	`jha`	ଝ	*jha*	`la`	ଲ	*la*
`LL`	ୡ or ୣ	*ḹ*	`~na`	ଞ	*ña*	`.va`	ୱ	*va*
`e`	ଏ or େ	*e*	`.ta`	ଟ	*ṭa*	`sha`	ଶ	*śa*
`ai`	ଐ or ୈ	*ai*	`.tha`	ଠ	*ṭha*	`.sa`	ଷ	*ṣa*
`o`	ଓ or ୋ	*o*	`.da`	ଡ	*ḍa*	`sa`	ସ	*sa*
`au`	ଔ or ୌ	*au*	`.dha`	ଢ	*ḍha*	`ha`	ହ	*ha*
`/`	ଁ	*ṁ*	`.na`	ଣ	*ṇa*	`.la`	ଳ	*ḷa*
`.m`	ଂ	*ṃ*	`ta`	ତ	*ta*	`.ra`	ଡ଼	*ṛa*
`.h`	ଃ	*ḥ*	`tha`	ଥ	*tha*	`.rha`	ଢ଼	*ṛha*
			`da`	ଦ	*da*	`+`	୍	
`~e`	ଏ୍	*ê*	`dha`	ଧ	*dha*			
`~o`	ଓ୍	*ô*	`na`	ନ	*na*			

Note that କ୍ଷ *kṣa* and ଜ୍ଞ *jña* are conjuncts, and typed as `k.sa` and `j~na` respectively.

When two vowels follow each other, care has to be taken that the pair can be distinguished from a single vowel transcribed with two letters. This is done by typing `"` between them. For example, when a short ଅ *a* follows another short ଅ *a*. For example କଅଣ *kaän,* should be typed as `ka"a.n`. When there is no danger for confusion, there is no need to separate vowels in this way. The following table should make all possible combinations clear:

`aa`	ଆ	*ā*	`kaa`	କା	*kā*
`a"a`	ଅଅ	*aa*	`ka"a`	କଅ	*kaa*
`a"aa`	ଅଆ	*aā*	`ka"aa`	କଆ	*kaā*
`ai`	ଐ	*ai*	`kai`	କୈ	*kai*
`a"i`	ଅଇ	*aï*	`ka"i`	କଇ	*kaï*
`au`	ଔ	*au*	`kau`	କୌ	*kau*
`a"u`	ଅଉ	*aü*	`ka"u`	କଉ	*kaü*
`ii`	ଈ	*ī*	`kii`	କୀ	*kī*
`i"i`	ଇଇ	*ii*	`ki"i`	କିଇ	*kii*
`uu`	ଊ	*ū*	`kuu`	କୂ	*kū*
`u"u`	ଉଉ	*uu*	`ku"u`	କୁଉ	*kuu*

It is important to take care to to type the inherent ଅ *a* when it is silent between two letters. It may be omitted at the end of a word.

To control the exact appearance of conjuncts, you can use the halant, which is transcribed as `+`. When you want to use the standard conjunct, just type the constituent consonants after each other: for example, `kra` gives you କ୍ର *kra.* If you want to use an explicit halant, type `k+ra` to get କ୍‌ର *kra.* If you want to use the variant କ୍ର *kra,* you can type it as `k++ra`.

Consult the table in the appendix for the exact appearance of each conjunct and possible variations.

In India, there are several editors which allow phonetic order typing of Oriya script. Such editors normally use the ISCII character set to represent Oriya characters internally. To allow those people who have the luxery of an ISCII editor to use Oriya-TEX, the pre-processor can also process ISCII, or convert between ISCII, Unicode, and transcription.

Oriya-TEX can also be used to typeset Oriya in scientific transcription. For this, the to be transcribed text has to be placed between `<ORTR>` and `</ORTR>`. The transcription as shown in the tables will be used. A silent *a* can be typed as `*`, and a capital is produced by preceeding it with a `ˆ` . A whole sentence in capitals can be produced by putting it in between `ˆ ˆ` .

Oriya

Konark regular 72pt

ଅ କୋଣାର୍କ

Konark regular 24pt

ଅ ଆ ଇ ଈ ଉ ଊ ଋ ଏ ଐ ଓ ଔ ଅଁ ଅଂ ଅଃ

କ ଖ ଗ ଘ ଙ ଚ ଛ ଜ ଝ ଞ ଟ ଠ ଡ ଢ ଣ ତ ଥ ଦ ଧ ନ

ପ ଫ ବ ଭ ମ ଯ ୟ ର ଲ ଳ ଶ ଷ ସ ହ

କ କା କି କୀ କୁ କୂ କୃ କେ କୈ କୋ କୌ କଁ କଂ କଃ

୧ ୨ ୩ ୪ ୫ ୬ ୭ ୮ ୯ ୦

Konark normal 10 pt କୋଣାର୍କ ନୋର୍ମଲ

ନମସ୍କାର । ଆସନ୍ତୁ । କମିତ ଅଛନ୍ତି? ଆପଣ ଖୁସିରେ ରହନ୍ତୁ । ଆପଣଙ୍କ ସମୃଦ୍ଧି ହେଉ । ଆପଣଙ୍କର ନୂଆ ବର୍ଷ ମଙ୍ଗଳମୟ ହେଉ । କ'ଣ ଖାଇବେ, ଚାହା ନା କଫି? ଆପଣଙ୍କ କାର୍ଯ୍ୟକ୍ରମ କ'ଣ ଅଛି? ଘରକୁ ଆସନ୍ତୁ । ଆପଣଙ୍କୁ ଦେଖା କରି ଖୁସି ହେଲି । ଆଉଥରେ ମିଶିବା ।

Konark slanted 10 pt *କୋଣାର୍କ ସ୍ଲନ୍ଟଡ*

ନମସ୍କାର । ଆସନ୍ତୁ । କମିତ ଅଛନ୍ତି? ଆପଣ ଖୁସିରେ ରହନ୍ତୁ । ଆପଣଙ୍କ ସମୃଦ୍ଧି ହେଉ । ଆପଣଙ୍କର ନୂଆ ବର୍ଷ ମଙ୍ଗଳମୟ ହେଉ । କ'ଣ ଖାଇବେ, ଚାହା ନା କଫି? ଆପଣଙ୍କ କାର୍ଯ୍ୟକ୍ରମ କ'ଣ ଅଛି? ଘରକୁ ଆସନ୍ତୁ । ଆପଣଙ୍କୁ ଦେଖା କରି ଖୁସି ହେଲି । ଆଉଥରେ ମିଶିବା ।

Konark bold 10 pt **କୋଣାର୍କ ବୋଲ୍ଡ**

ନମସ୍କାର । ଆସନ୍ତୁ । କମିତ ଅଛନ୍ତି? ଆପଣ ଖୁସିରେ ରହନ୍ତୁ । ଆପଣଙ୍କ ସମୃଦ୍ଧି ହେଉ । ଆପଣଙ୍କର ନୂଆ ବର୍ଷ ମଙ୍ଗଳମୟ ହେଉ । କ'ଣ ଖାଇବେ, ଚାହା ନା କଫି? ଆପଣଙ୍କ କାର୍ଯ୍ୟକ୍ରମ କ'ଣ ଅଛି? ଘରକୁ ଆସନ୍ତୁ । ଆପଣଙ୍କୁ ଦେଖା କରି ଖୁସି ହେଲି । ଆଉଥରେ ମିଶିବା ।

Konark bold slanted 10 pt ***କୋଣାର୍କ ବୋଲ୍ଡ ସ୍ଲନ୍ଟଡ***

ନମସ୍କାର । ଆସନ୍ତୁ । କମିତ ଅଛନ୍ତି? ଆପଣ ଖୁସିରେ ରହନ୍ତୁ । ଆପଣଙ୍କ ସମୃଦ୍ଧି ହେଉ । ଆପଣଙ୍କର ନୂଆ ବର୍ଷ ମଙ୍ଗଳମୟ ହେଉ । କ'ଣ ଖାଇବେ, ଚାହା ନା କଫି? ଆପଣଙ୍କ କାର୍ଯ୍ୟକ୍ରମ କ'ଣ ଅଛି? ଘରକୁ ଆସନ୍ତୁ । ଆପଣଙ୍କୁ ଦେଖା କରି ଖୁସି ହେଲି । ଆଉଥରେ ମିଶିବା ।

Oriya

Cuttack regular 72pt

ଅ କଟକ

Cuttack regular 24pt

ଅ ଆ ଇ ଈ ଉ ଊ ଋ ଏ ଐ ଓ ଔ ଅଁ ଅଂ ଅଃ
କ ଖ ଗ ଘ ଙ ଚ ଛ ଜ ଝ ଞ ଟ ଠ ଡ ଢ ଣ ତ ଥ ଦ ଧ ନ
ପ ଫ ବ ଭ ମ ଯ ୟ ର ଲ ଳ ଶ ଷ ସ ହ
କ କା କି କୀ କୁ କୂ କୃ କେ କୈ କୋ କୌ କଁ କଂ କଃ
୧ ୨ ୩ ୪ ୫ ୬ ୭ ୮ ୯ ୦

Cuttack normal 10 pt କଟକ ନୋର୍ମଲ

ନମସ୍କାର । ଆସନ୍ତୁ । କିମିତି ଅଛନ୍ତି? ଆପଣ ଖୁସିରେ ରହନ୍ତୁ । ଆପଣଙ୍କ ସମୃଦ୍ଧି ହେଉ । ଆପଣଙ୍କର ନୂଆ ବର୍ଷ ମଙ୍ଗଳମୟ ହେଉ । କ'ଣ ଖାଇବେ, ଚାହା ନା କଫି? ଆପଣଙ୍କ କାର୍ଯ୍ୟକ୍ରମ କ'ଣ ଅଛି? ଘରକୁ ଆସନ୍ତୁ । ଆପଣଙ୍କୁ ଦେଖା କରି ଖୁସି ହେଲି । ଆଉଥରେ ମିଶିବା ।

Cuttack slanted 10 pt *କଟକ ସ୍ଲନ୍ଟଡ*

ନମସ୍କାର । ଆସନ୍ତୁ । କିମିତି ଅଛନ୍ତି? ଆପଣ ଖୁସିରେ ରହନ୍ତୁ । ଆପଣଙ୍କ ସମୃଦ୍ଧି ହେଉ । ଆପଣଙ୍କର ନୂଆ ବର୍ଷ ମଙ୍ଗଳମୟ ହେଉ । କ'ଣ ଖାଇବେ, ଚାହା ନା କଫି? ଆପଣଙ୍କ କାର୍ଯ୍ୟକ୍ରମ କ'ଣ ଅଛି? ଘରକୁ ଆସନ୍ତୁ । ଆପଣଙ୍କୁ ଦେଖା କରି ଖୁସି ହେଲି । ଆଉଥରେ ମିଶିବା ।

Cuttack bold 10 pt **କଟକ ବୋଲ୍ଡ**

ନମସ୍କାର । ଆସନ୍ତୁ । କିମିତି ଅଛନ୍ତି? ଆପଣ ଖୁସିରେ ରହନ୍ତୁ । ଆପଣଙ୍କ ସମୃଦ୍ଧି ହେଉ । ଆପଣଙ୍କର ନୂଆ ବର୍ଷ ମଙ୍ଗଳମୟ ହେଉ । କ'ଣ ଖାଇବେ, ଚାହା ନା କଫି? ଆପଣଙ୍କ କାର୍ଯ୍ୟକ୍ରମ କ'ଣ ଅଛି? ଘରକୁ ଆସନ୍ତୁ । ଆପଣଙ୍କୁ ଦେଖା କରି ଖୁସି ହେଲି । ଆଉଥରେ ମିଶିବା ।

Cuttack bold slanted 10 pt ***କଟକ ବୋଲ୍ଡ ସ୍ଲନ୍ଟଡ***

ନମସ୍କାର । ଆସନ୍ତୁ । କିମିତି ଅଛନ୍ତି? ଆପଣ ଖୁସିରେ ରହନ୍ତୁ । ଆପଣଙ୍କ ସମୃଦ୍ଧି ହେଉ । ଆପଣଙ୍କର ନୂଆ ବର୍ଷ ମଙ୍ଗଳମୟ ହେଉ । କ'ଣ ଖାଇବେ, ଚାହା ନା କଫି? ଆପଣଙ୍କ କାର୍ଯ୍ୟକ୍ରମ କ'ଣ ଅଛି? ଘରକୁ ଆସନ୍ତୁ । ଆପଣଙ୍କୁ ଦେଖା କରି ଖୁସି ହେଲି । ଆଉଥରେ ମିଶିବା ।

Table of Oriya letters

All basic characters of the Oriya script are given, together with their Roman transliteration, ISCII* and Unicode** code-position, ASCII representation, and name. In a few cases, two ISCII characters are needed to represent a single Oriya character. The vowel signs are given on a dotted circle, which represents the consonant or conjunct to which the vowel sign is to be applied.
No source, so far, has given me the appearance of the vowel-signs for the Sanskrit vowels ୠ, ଌ, and ୡ.
Conjuncts and ligatures of consonants and vowel signs are given in the next sections.

Oriya	**Roman**	**ISCII**	**Unicode**	**ASCII**	**name**
vowels					
ଅ	a	A4	0B05	a	vowel a
ଆ	ā	A5	0B06	aa	vowel aa
ଇ	i	A6	0B07	i	vowel i
ଈ	ī	A7	0B08	ii	vowel ii
ଉ	u	A8	0B09	u	vowel u
ଊ	ū	A9	0B0A	uu	vowel uu
ଋ	ṛ	AA	0B0B	R	vowel ri
ୠ	ṝ	AA E9	0B60	RR	vowel rii
ଌ	ḷ	A6 E9	0B0C	L	vowel li
ୡ	ḹ	A7 E9	0B61	LL	vowel lii
ଏ	e	AC	0B0F	e	vowel e
ଐ	ai	AD	0B10	ai	vowel ai
ଓ	o	B0	0B13	o	vowel o
ଔ	au	B1	0B14	au	vowel au
vowel modifiers					
ଅଁ	aṁ	A1	0B01	/	candrabindu
ଅଂ	aṃ	A2	0B02	.m	anusvar
ଅଃ	aḥ	A3	0B03	.h	visarg
consonants					
କ	ka	B3	0B15	k	consonant ka
ଖ	kha	B4	0B16	kh	consonant kha
ଗ	ga	B5	0B17	g	consonant ga
ଘ	gha	B6	0B18	gh	consonant gha
ଙ	ṅa	B7	0B19	"n	consonant nga
ଚ	ca	B8	0B1A	c	consonant ca
ଛ	cha	B9	0B1B	ch	consonant cha
ଜ	ja	BA	0B1C	j	consonant ja
ଝ	jha	BB	0B1D	jh	consonant jha
ଞ	ña	BC	0B1E	~n	consonant nya
ଟ	ṭa	BD	0B1F	.t	consonant tta
ଠ	ṭha	BE	0B20	.th	consonant ttha
ଡ	ḍa	BF	0B21	.d	consonant dda
ଢ	ḍha	C0	0B22	.dh	consonant ddha
ଣ	ṇa	C1	0B23	.n	consonant nna
ତ	ta	C2	0B24	t	consonant ta
ଥ	tha	C3	0B25	th	consonant tha
ଦ	da	C4	0B26	d	consonant da
ଧ	dha	C5	0B27	dh	consonant dha
ନ	na	C6	0B28	n	consonant na
ପ	pa	C8	0B2A	p	consonant pa

* Indian Script Code for Information Interchange, IS 13194:1991
** The Unicode Standard, Version 1.0, Vol 1., and checked against the tables of version 2.014

ଫ	pha	C9	0B2B	ph	consonant pha
ବ	ba	CA	0B2C	b	consonant ba
ଭ	bha	CB	0B2D	bh	consonant bha
ମ	ma	CC	0B2E	m	consonant ma
ୟ	ya	CD	0B5F	y	consonant ya
ଯ	ẏa	CE	0B2F	.y	consonant yya
ର	ra	CF	0B30	r	consonant ra
ଲ	la	D1	0B32	l	consonant la
ୱ	va	D4	0B13 0B4D 0B2C	.v	consonant va
ବ଼	ba	--	--	.b	consonant ba with dot
ଶ	śa	D5	0B36	sh	consonant sha
ଷ	ṣa	D6	0B37	.s	consonant ssa
ସ	sa	D7	0B38	s	consonant sa
ହ	ha	D8	0B39	h	consonant ha
ଳ	ḷa	D2	0B33	.l	consonant lla
ଡ଼	ṛa	BF E9	0B5C	.r	consonant rra
ଢ଼	ṛha	C0 E9	0B5D	.rh	consonant rrha
vowel signs					
◌ା	ā	DA	0B3E	aa	vowel sign aa
◌ି	i	DB	0B3F	i	vowel sign i
◌ୀ	ī	DC	0B40	ii	vowel sign ii
◌ୁ	u	DD	0B41	u	vowel sign u
◌ୂ	ū	DE	0B42	uu	vowel sign uu
◌ୃ	ṛ	DF	0B43	R	vowel sign ri
◌ୄ	ṝ	DF E9	--	RR	vowel sign rii
◌ୢ	ḷ	DB E9	--	L	vowel sign li
◌ୣ	ḹ	DC E9	--	LL	vowel sign lii
◌େ	e	E1	0B47	e	vowel sign e
◌ୈ	ai	E2	0B48	ai	vowel sign ai
◌ୋ	o	E4	0B4B	o	vowel sign o
◌ୌ	au	E5	0B4C	au	vowel sign au
additional vowels					
ଏ୍ୟ	ê	--	0B0F 0B4D 0B5F	˜e	
ଓ୍ୟ	ô	--	0B13 0B4D 0B5F	˜o	
other signs and symbols					
◌୍		E8	0B4D	+	halant
ଽ		EA E9	0B3D	.a	avagraha
୰		--	0B70		isshar
ଓଁ		A1 E9	--	.o	om sign
digits					
୦	0	F1	0B66	0	digit zero
୧	1	F2	0b67	1	digit one
୨	2	F3	0B68	2	digit two
୩	3	F4	0B69	3	digit three
୪	4	F5	0B6A	4	digit four
୫	5	F6	0B6B	5	digit five
୬	6	F7	0B6C	6	digit six
୭	7	F8	0B6D	7	digit seven
୮	8	F9	0B6E	8	digit eight
୯	9	FA	0B6F	9	digit nine
conjunct control					
କ୍ର	kra	B3 E8 CF	0B15 0B4D 0B30	kra	*ordinary conjunct*
କ୍‌ର	kra	B3 E8 E8 CF	0B15 0B4D 200C 0B30	k+ra	*explicit halant*
କ୍‍ର	kra	B3 E8 E8 E8 CF	0B15 0B4D 200D 0B30	k++ra	*alternate conjunct*

Table of Consonant-Vowel Sign Combinations

Vowel-signs often combine with the consonant or conjunct they modify.

	a	*ā*	*i*	*ī*	*u*	*ū*	*ṛ*	*e*	*ai*	*o*	*au*	*ṁ*	*ṃ*	*ḥ*
	ଅ	ଆ	ଇ	ଈ	ଉ	ଊ	ଋ	ଏ	ଐ	ଓ	ଔ	ଅଁ	ଅଂ	ଅଃ
k	କ	କା	କି	କୀ	କୁ	କୂ	କୃ	କେ	କୈ	କୋ	କୌ	କଁ	କଂ	କଃ
kh	ଖ	ଖା	ଖି	ଖୀ	ଖୁ	ଖୂ	ଖୃ	ଖେ	ଖୈ	ଖୋ	ଖୌ	ଖଁ	ଖଂ	ଖଃ
g	ଗ	ଗା	ଗି	ଗୀ	ଗୁ	ଗୂ	ଗୃ	ଗେ	ଗୈ	ଗୋ	ଗୌ	ଗଁ	ଗଂ	ଗଃ
gh	ଘ	ଘା	ଘି	ଘୀ	ଘୁ	ଘୂ	ଘୃ	ଘେ	ଘୈ	ଘୋ	ଘୌ	ଘଁ	ଘଂ	ଘଃ
ṅ	ଙ	ଙା	ଙି	ଙୀ	ଙୁ	ଙୂ	ଙୃ	ଙେ	ଙୈ	ଙୋ	ଙୌ	ଙଁ	ଙଂ	ଙଃ
c	ଚ	ଚା	ଚି	ଚୀ	ଚୁ	ଚୂ	ଚୃ	ଚେ	ଚୈ	ଚୋ	ଚୌ	ଚଁ	ଚଂ	ଚଃ
ch	ଛ	ଛା	ଛି	ଛୀ	ଛୁ	ଛୂ	ଛୃ	ଛେ	ଛୈ	ଛୋ	ଛୌ	ଛଁ	ଛଂ	ଛଃ
j	ଜ	ଜା	ଜି	ଜୀ	ଜୁ	ଜୂ	ଜୃ	ଜେ	ଜୈ	ଜୋ	ଜୌ	ଜଁ	ଜଂ	ଜଃ
jh	ଝ	ଝା	ଝି	ଝୀ	ଝୁ	ଝୂ	ଝୃ	ଝେ	ଝୈ	ଝୋ	ଝୌ	ଝଁ	ଝଂ	ଝଃ
ñ	ଞ	ଞା	ଞି	ଞୀ	ଞୁ	ଞୂ	ଞୃ	ଞେ	ଞୈ	ଞୋ	ଞୌ	ଞଁ	ଞଂ	ଞଃ
ṭ	ଟ	ଟା	ଟି	ଟୀ	ଟୁ	ଟୂ	ଟୃ	ଟେ	ଟୈ	ଟୋ	ଟୌ	ଟଁ	ଟଂ	ଟଃ
ṭh	ଠ	ଠା	ଠି	ଠୀ	ଠୁ	ଠୂ	ଠୃ	ଠେ	ଠୈ	ଠୋ	ଠୌ	ଠଁ	ଠଂ	ଠଃ
ḍ	ଡ	ଡା	ଡି	ଡୀ	ଡୁ	ଡୂ	ଡୃ	ଡେ	ଡୈ	ଡୋ	ଡୌ	ଡଁ	ଡଂ	ଡଃ
ḍh	ଢ	ଢା	ଢି	ଢୀ	ଢୁ	ଢୂ	ଢୃ	ଢେ	ଢୈ	ଢୋ	ଢୌ	ଢଁ	ଢଂ	ଢଃ
ṇ	ଣ	ଣା	ଣି	ଣୀ	ଣୁ	ଣୂ	ଣୃ	ଣେ	ଣୈ	ଣୋ	ଣୌ	ଣଁ	ଣଂ	ଣଃ
t	ତ	ତା	ତି	ତୀ	ତୁ	ତୂ	ତୃ	ତେ	ତୈ	ତୋ	ତୌ	ତଁ	ତଂ	ତଃ
th	ଥ	ଥା	ଥି	ଥୀ	ଥୁ	ଥୂ	ଥୃ	ଥେ	ଥୈ	ଥୋ	ଥୌ	ଥଁ	ଥଂ	ଥଃ
d	ଦ	ଦା	ଦି	ଦୀ	ଦୁ	ଦୂ	ଦୃ	ଦେ	ଦୈ	ଦୋ	ଦୌ	ଦଁ	ଦଂ	ଦଃ
dh	ଧ	ଧା	ଧି	ଧୀ	ଧୁ	ଧୂ	ଧୃ	ଧେ	ଧୈ	ଧୋ	ଧୌ	ଧଁ	ଧଂ	ଧଃ
n	ନ	ନା	ନି	ନୀ	ନୁ	ନୂ	ନୃ	ନେ	ନୈ	ନୋ	ନୌ	ନଁ	ନଂ	ନଃ
p	ପ	ପା	ପି	ପୀ	ପୁ	ପୂ	ପୃ	ପେ	ପୈ	ପୋ	ପୌ	ପଁ	ପଂ	ପଃ
ph	ଫ	ଫା	ଫି	ଫୀ	ଫୁ	ଫୂ	ଫୃ	ଫେ	ଫୈ	ଫୋ	ଫୌ	ଫଁ	ଫଂ	ଫଃ
b	ବ	ବା	ବି	ବୀ	ବୁ	ବୂ	ବୃ	ବେ	ବୈ	ବୋ	ବୌ	ବଁ	ବଂ	ବଃ
bh	ଭ	ଭା	ଭି	ଭୀ	ଭୁ	ଭୂ	ଭୃ	ଭେ	ଭୈ	ଭୋ	ଭୌ	ଭଁ	ଭଂ	ଭଃ
m	ମ	ମା	ମି	ମୀ	ମୁ	ମୂ	ମୃ	ମେ	ମୈ	ମୋ	ମୌ	ମଁ	ମଂ	ମଃ
y	ଯ	ଯା	ଯି	ଯୀ	ଯୁ	ଯୂ	ଯୃ	ଯେ	ଯୈ	ଯୋ	ଯୌ	ଯଁ	ଯଂ	ଯଃ
ẏ	ୟ	ୟା	ୟି	ୟୀ	ୟୁ	ୟୂ	ୟୃ	ୟେ	ୟୈ	ୟୋ	ୟୌ	ୟଁ	ୟଂ	ୟଃ
r	ର	ରା	ରି	ରୀ	ରୁ	ରୂ	ରୃ	ରେ	ରୈ	ରୋ	ରୌ	ରଁ	ରଂ	ରଃ
l	ଲ	ଲା	ଲି	ଲୀ	ଲୁ	ଲୂ	ଲୃ	ଲେ	ଲୈ	ଲୋ	ଲୌ	ଲଁ	ଲଂ	ଲଃ
ś	ଶ	ଶା	ଶି	ଶୀ	ଶୁ	ଶୂ	ଶୃ	ଶେ	ଶୈ	ଶୋ	ଶୌ	ଶଁ	ଶଂ	ଶଃ
ṣ	ଷ	ଷା	ଷି	ଷୀ	ଷୁ	ଷୂ	ଷୃ	ଷେ	ଷୈ	ଷୋ	ଷୌ	ଷଁ	ଷଂ	ଷଃ
s	ସ	ସା	ସି	ସୀ	ସୁ	ସୂ	ସୃ	ସେ	ସୈ	ସୋ	ସୌ	ସଁ	ସଂ	ସଃ
h	ହ	ହା	ହି	ହୀ	ହୁ	ହୂ	ହୃ	ହେ	ହୈ	ହୋ	ହୌ	ହଁ	ହଂ	ହଃ
ḷ	ଳ	ଳା	ଳି	ଳୀ	ଳୁ	ଳୂ	ଳୃ	ଳେ	ଳୈ	ଳୋ	ଳୌ	ଳଁ	ଳଂ	ଳଃ

combinations of vowel signs, reph and candrabindu

◌ିଁ ର୍◌ି ର୍◌ିଁ ◌ୈଁ ର୍◌ୈ ର୍◌ୈଁ ◌ୌଁ ର୍◌ୌ ର୍◌ୌଁ

Table of Conjunct Consonants

The conjunct consonants in Oriya are very intricate and irregular. The table below gives all the conjuncts included in the font, however, not all of these will be automatically used by the pre-processor.
The conjuncts were collected from various sources. I consulted various Oriya grammars and dictionaries, and inspected the Oriya font produced by C-DAC. All conjuncts encountered, except for those fully regular, like କ୍ର *kra* and ପ୍ୟ *pya,* have been included in this list.

କ + କ	= କ୍କ	kka	ଦ + ମ	= ଦ୍ମ	dma
କ + ତ	= କ୍ତ	kta	ଧ + ୟ	= ଧ୍ୟ	dhya
କ + ର	= କ୍ର or କ୍ର	kra	ଧ + ବ	= ଧ୍ୱ	dhva
କ + ଲ	= କ୍ଲ	kla	ନ + ତ	= ନ୍ତ	nta
କ + ବ	= କ୍ୱ	kva	ନ + ତ + ୟ	= ନ୍ତ୍ୟ	ntya
କ + ଷ	= କ୍ଷ	kṣa	ନ + ତ + ର	= ନ୍ତ୍ର	ntra
କ + ଷ + ଣ	= କ୍ଷ୍ଣ	kṣṇa	ନ + ଥ	= ନ୍ଥ	ntha
କ + ସ	= କ୍ସ	ksa	ନ + ଦ	= ନ୍ଦ	nda
ଖ + ୟ	= ଖ୍ୟ	khya	ନ + ଧ	= ନ୍ଧ	ndha
ଗ + ନ	= ଗ୍ନ	gna	ନ + ନ	= ନ୍ନ	nna
ଗ + ର	= ଗ୍ର	gra	ପ + ୟ	= ପ୍ୟ	pya
ଗ + ଲ	= ଗ୍ଲ	gla	ବ + ଦ	= ବ୍ଦ	bda
ଘ + ନ	= ଘ୍ନ	ghna	ବ + ବ	= ବ୍ବ	bba
ଙ + କ	= ଙ୍କ	ṅka	ପ + ତ	= ପ୍ତ	pta
ଙ + ଖ	= ଙ୍ଖ	ṅkha	ପ + ସ	= ପ୍ସ	psa
ଙ + ଗ	= ଙ୍ଗ	ṅga	ମ + ପ	= ମ୍ପ	mpa
ଙ + ଘ	= ଙ୍ଘ	ṅgha	ମ + ଫ	= ମ୍ଫ	mpha
ଚ + ଚ	= ଚ୍ଚ	cca	ମ + ବ	= ମ୍ବ	mba
ଚ + ଛ	= ଚ୍ଛ	ccha	ମ + ଭ	= ମ୍ଭ	mbha
ଜ + ଜ	= ଜ୍ଜ	jja	ମ + ମ	= ମ୍ମ	mma
ଜ + ଞ	= ଜ୍ଞ	jña	ର + ଣ + ଣ	= ର୍ଣ୍ଣ	rṇṇa
ଜ + ୟ	= ଜ୍ୟ	jya	ର + ବ	= ର୍ବ	rba
ଜ + ବ	= ଜ୍ୱ	jva	ଲ + କ	= ଲ୍କ	lka
ଞ + ଚ	= ଞ୍ଚ	ñca	ଲ + ପ	= ଲ୍ପ	lpa
ଞ + ଛ	= ଞ୍ଛ	ñcha	ଲ + ଫ	= ଲ୍ଫ	lpha
ଞ + ଜ	= ଞ୍ଜ	ñja	ଲ + ଲ	= ଲ୍ଲ	lla
ଞ + ଝ	= ଞ୍ଝ	ñjha	ଶ + ଚ	= ଶ୍ଚ	śca
ଟ + ଟ	= ଟ୍ଟ	ṭṭa	ଶ + ଛ	= ଶ୍ଛ	ścha
ଡ + ଡ	= ଡ୍ଡ	ḍḍa	ଶ + ଟ	= ଶ୍ଟ	śṭa
ଣ + ଟ	= ଣ୍ଟ	ṇṭa	ଶ + ନ	= ଶ୍ନ	śna
ଣ + ଠ	= ଣ୍ଠ	ṇṭha	ଷ + କ	= ଷ୍କ	ṣka
ଣ + ଡ	= ଣ୍ଡ	ṇḍa	ଷ + ଟ	= ଷ୍ଟ	ṣṭa
ଣ + ଢ	= ଣ୍ଢ	ṇḍha	ଷ + ଠ	= ଷ୍ଠ	ṣṭha
ଣ + ଣ	= ଣ୍ଣ	ṇṇa	ଷ + ଣ	= ଷ୍ଣ	ṣṇa
ତ + ତ	= ତ୍ତ	tta	ଷ + ପ	= ଷ୍ପ	ṣpa
ତ + ନ	= ତ୍ନ	tna	ଷ + ଫ	= ଷ୍ଫ	ṣpha
ତ + ମ	= ତ୍ମ or ତ୍ମ	tma	ସ + କ	= ସ୍କ	ska
ତ + ର	= ତ୍ର or ତ୍ର	tra	ସ + ତ	= ସ୍ତ	sta
ତ + ସ	= ତ୍ସ	tsa	ସ + ତ + ର	= ସ୍ତ୍ର	stra
ଦ + ଗ	= ଦ୍ଗ	dga	ସ + ଥ	= ସ୍ଥ	stha
ଦ + ଦ	= ଦ୍ଦ	dda	ସ + ପ	= ସ୍ପ	spa
ଦ + ଧ	= ଦ୍ଧ	ddha	ସ + ଫ	= ସ୍ଫ	spha
ଦ + ଭ	= ଦ୍ଭ	dbha			

Glyph Chart

This chart gives all the glyphs and their positions in the Oriya font. Software should not rely on a certain glyph having a certain position in this chart, but use the symbolic names for glyphs and the mapping tables supplied with the font. The font includes several copies of the same glyph in different positions. Although such copies are not strictly necessary for a composing system as strong as TEX, they will make life much easier to use the font in a Windows environment, to which I intend to adapt it.