Contents

I picked up Professor Madhav Deshpande's book in November 2020. These are my notes from his book. While studying from his book, I explored a variety of relevant resources available on the WWW. These notes rely heavily on those wonderful resources. These notes are a unification of what I could find on various topics as seen from my perspective.

1 Introduction

The book begins with an overview of Sanskrit that we shall cover below. It touches upon the language's history and evolution, writing system, sounds, grammar, and syntax.

1.1 Grammar

Sanskrit (संस्कृत), like Greek and Latin, is an *inflected* language. This means it shows *alteration in form especially by adding affixes*. The bulk of grammatical information is carried by morphology (i.e. the rules for forming admissible words).
A *morpheme* which is the minimal meaningful language unit, is of one of these types:

1. nominal stem (adjectives, pronouns, and indeclinables(अव्ययम्))
    - primary
    - secondary
        - derived from other nominals via affixation (e.g. कुरु + अ = कौरव, नर + त्व = नरत्व)
        - derived from verbal roots via affixation (e.g. गम् + अन = गमन, कृ + तृ = कर्तृ)
        - compounds (e.g. नर + पति = नरपति, चक्र + पाणि = चक्रपाणि)
2. verbal root (धातु:)
    - primary
    - secondary
3. indeclinables (अव्ययम्)
    - particles (e.g. उपरि)
    - pre-positions (e.g. अधि, परि, अनु)
    - post-positions
    - adverbs (e.g. सततम्)
    - connectives (e.g. च, वा)
    - (occasionally) nouns

The nominal stem is characterized by gender as an *intrinsic property* and it is grammatical, usually unrelated to semantics (though the living beings are usually masculine or feminine). There are three genders:

- masculine,
- feminine, and
- neuter

Between masculine and feminine, the former is *generic*, meaning it takes precedence. For pronouns, neuter is the most generic.
Declension of nouns (as we shall later see, declension serves the same purpose that prepositions serve in English) is affected by several factors such as their

- gender (masculine, feminine, neuter),
- final sound or sounds of the stem (e.g. अकारान्त, न्-कारान्त),
- number (singular, dual, and plural), and
- case (प्रथमा : nominative – I, द्वितीया : accusative – II, तृतीया : instrumental – III, चतुर्थी : dative – IV, पञ्चमी : ablative – V, षष्ठी : genitive – VI, सप्तमी : locative – VII, सम्बोधनम् : vocative – VIII). The following list may help describe the usual purpose of cases:
    1. nominative – serving as or indicating the *subject* of the verb (कर्ता)
    2. accusative – serving as or indicating the *(direct) object* of the verb (कर्म)
    3. instrumental – serving or acting as a *means* or aid (साधन, करण)
    4. dative – serving as the *(indirect) object* or the recipient (beneficiary) of the action of the verb (सम्प्रदानम्)
    5. ablative – indicating the *source or separation* of the agent, instrument, or location (अपादानम्)
    6. genitive – expressing *ownership* (–)
    7. locative – designating the *place or state or action* denoted by the verb (अधिकरणम्)
    8. vocative – identifying the person being *addressed* (सम्बोधनम्)

Here is the declension of a masculine अकारान्त word देव :

Singular (एकवचनम्)	Dual (द्विवचनम्)	Plural (बहुवचनम्)	
देवः	देवौ	देवाः	प्रथमा
देवं (देवम्)	देवौ	देवान्	द्वितीया
देवेन	देवाभ्यां (देवाभ्याम्)	देवैः	तृतीया
देवाय	देवाभ्यां (देवाभ्याम्)	देवेभ्यः	चतुर्थी
देवात्	देवाभ्यां (देवाभ्याम्)	देवेभ्यः	पञ्चमी
देवस्य	देवयोः	देवानां (देवानाम्)	षष्ठी
देवे	देवयोः	देवेषु	सप्तमी
हे देव	हे देवौ	हे देवाः	सम्बोधनम्

The verbal system is more complex and in the vedic system it is even more so [than the classical system]. The book describes complexities of the vedic verbal system and mentions that classical verbal system gradually got rid of a lot of constructs from the former.
Here is an overview of the complexities of the grammar of the vedic language:

1. Verb roots (धातवः) are generally of two types: *athematic* and *thematic*.
    (a) Athematic: Variable accent[1] and variable stem to which *terminations are directly attached* (e.g. अस् + ति = अस्ति)

[1] Accent or Stress in linguistics is the relative emphasis or prominence given to a certain syllable (unit of speech sounds) in a word or to a certain word in a phrase or sentence

(b) Thematic: Invariable accent and invariable stem followed by the thematic vowel अ before the termination (e.g. बुध् + अ + ति = बोधति). This helps make various verb forms more regular as the complex interactions between the root-final consonant and suffix-initial vowel are prevented by the intervening अ .

2. A verb has a single *root*, however, in Vedic Samskritam it may have many *stems*[2]. Consider the following forms (root, stem, affixes) with respect to a single verbal root गम् which means "to go". Forms depend upon *voice*, *number*, and *person* of the *agent* (कर्ता), but for brevity, we show the form only[3] for the singular (एकवचनम्), active (कर्तरि) voice, and third person (प्रथम पुरुष:):

   (a) Tenses:
      i. Present (लट् – गच्छति)
      ii. Aorist[4] (expressing action (especially past action) without indicating its completion or continuation) (लुङ् – अगमत्)
      iii. Imperfect Past (लङ् – अगच्छत्)
      iv. Perfect (लिट् – जगाम)
      v. Future (लृट् – गमिष्यति)

   (b) Moods:
      i. Indicative (simple declarations) (लट् – गच्छति)
      ii. Injunctive (could indicate *intention*) (जिगमत्)
      iii. Subjunctive (typically used to express various states of reality such as wish, emotion, judgment etc.)
      iv. Optative (wish, request, or command) (गच्छेत्)
      v. Imperative (command or request) (गच्छतु)

   (c) Meanings of the *present tense* stems:
      i. Indicative (simple declarations)(लट् – गच्छति)
      ii. Intensive (denotes stronger, more forceful, or more concentrated action relative to the root on which the intensive is built) (जङ्गम्यते)

   (d) Participle forms indicating tenses and voices (these forms depend on the gender of the nominal they modify):
      i. Past Passive (गत, गता)
      ii. Past Active (गतवत्, गतवती)
      iii. Present Active (गच्छत्, गच्छन्ती)
      iv. Present Middle (गच्छमान, गच्छमाना)
      v. Present Passive (गम्यमान, गम्यमाना)
      vi. ...

3. Verb conjugations could also be one of

   (a) Primary

   (b) Causative

[2] A stem is that part of a word that inflectional affixes attach to
[3] See here for a programmatic interface to all the forms of गम्
[4] There are several aorist tense forms in Samskritam

(c) Intensive

(d) Desiderative (a verb formed from another and expressing a desire to do the act denoted by the root verb)

4. All of this clearly means that the number of derived forms was very large. See Table 16 for a more complete list of verb conjugations and related forms.

The verbal form complexity was greatly reduced in the classical language. The so-called लकाराः show a glimpse of a plethora of forms that a verbal root leads to:

लट् वर्तमाने लेट् वेदे भूते लङ् लुङ् लिटस्तथा ।
विध्याशिषोस्तु लिङ्लोटौ लुट् लृट् लृङ् च भविष्यति ॥

The language evolved to favor nominal sentences over verbal sentences.
The most remarkable feature of the classical language is the *compounds* (especially their phenomenal length). Here is an example from Jayadeva's गीतगोविन्द :

चन्दनचर्चितनीलकलेवरपीतवसनवनमाली।
केलिचलन्मणिकुण्डलमण्डित गण्डयुगः स्मितशाली॥

The author believes that several changes occurred to the vedic Sanskrit that Panini grammarized. There was also the influence of local languages. In spite of that, because of Panini's efforts, the language established itself as an "elite language". In such evolution, the language's *surface forms*[5] were retained.

2 The संस्कृत Alphabet

2.1 Basics

2.1.1 Vowels (when not combined with consonants)

There are 13 vowels of which 5 are short (ह्रस्व) and 8 are long (दीर्घ). Not combined with consonants, here they are:
In addition to these 13 *independent* vowels, there are two "add-on signs" that, like other vowels, conjugate with consonants:

1. ◌ं – अनुस्वारः
2. ◌ः – विसर्गः

One last vowel-like letter is "अवग्रह" which elongates the pronunciation of a preceding vowel: ऽ . The independent vowels conjugate with consonants and create "add-on signs" that we will see below.
There are 33 consonants and 2 special consonant clusters. The arrangement is according to the location and mechanism of sound production:
Table 3 shows the *phonetic analysis* of the Sanskrit Alphabet. In that table, 'Voice' feature refers to *sonorous vibration*, 'Asp' (aspiration) feature refers to a *rush of air*, and 'Nasal' refers to sound generation with the passage of air through nose (and not mouth[6]). If a feature is present, a '+'

Table 1: Sanskrit Vowels

अ	आ
इ	ई
उ	ऊ
ऋ	ॠ
ऌ	
ए	ऐ
ओ	औ

Table 2: Sanskrit Consonants

Velar (Guttral) (कण्ठ्य)	क	ख	ग	घ	ङ
Palatal (मूर्धन्य)	च	छ	ज	झ	ञ
Cerebral (तालव्य)	ट	ठ	ड	ढ	ण
Dental (दन्त्य)	त	थ	द	ध	न
Labial (ओष्ठ्य)	प	फ	ब	भ	म
Semivowels	य	र	ल	व	
Sibilants (hissing sound)	श	ष	स		
Aspirate (rush of air)	ह				
Special consonant clusters	क्ष	ज्ञ			

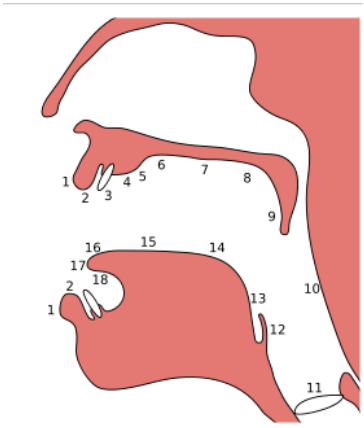
Table 3: Phonetic Analysis

Places of Articulation	Stop -Voice -Asp	Stop -Voice +Asp	Stop +Voice -Asp	Stop +Voice +Asp	Stop +Voice -Asp +Nasal	Semi-vowels +Voice -Asp	Sibilants +Voice +Asp	Sibilants -Voice +Asp
कण्ठ्य	क	ख	ग	घ	ङ		ह	◌ः
मूर्धन्य	च	छ	ज	झ	ञ	य अनुनासिक य		श
तालव्य	ट	ठ	ड	ढ	ण	र		ष
दन्त्य	त	थ	द	ध	न	ल अनुनासिक ल		स
ओष्ठ्य	प	फ	ब	भ	म	व अनुनासिक व		

preceeds it (e.g. '+Voice' – generation of a sonorous vibration) and if a '-' preceeds it, that feature is absent (e.g. '-Asp' – no rush of air).

Figure 1 (taken from Wikipedia) shows the places where the sound is produced in its audible form[7].

We have already seen the Sanskrit alphabet in Tables 1 and 2. In the written form, when one consonant conjugates with one vowel, we see an alternate representation. For example, when क combines with इ, the resulting conjugate is written as कि and not क.इ.



Places of articulation (passive & active): 1. Exo-labial, 2. Endo-labial, 3. Dental, 4. Alveolar, 5. Post-alveolar, 6. Pre-palatal, 7. Palatal, 8. Velar, 9. Uvular, 10. Pharyngeal, 11. Glottal, 12. Epiglottal, 13. Radical, 14. Postero-dorsal, 15. Antero-dorsal, 16. Laminal, 17. Apical, 18. Sub-apical

Figure 1: Places of Articulation

[5]Surface form of a word is the form of a word as it appears in the text (e.g. "goes" is a surface form of the verb "go"). Contrast it with the lexical form which consists of things such as the root, the part of speech etc.

[6]Nearly all nasal consonants are nasal occlusives, in which air escapes through the nose but not through the mouth, as it is blocked (occluded) by the lips or tongue.

[7]Articulation means the aspect of pronunciation that involves bringing articulatory (speech) organs together so as to shape the sounds of speech.

These are collectively called the “add-on vowel signs” and they look like below (note that each of them has a Unicode codepoint which means that it is recognized as a distinct character in a writing system (in this case देवनागरी)). There is no add-on vowel sign for अ ; when conjugated with अ , the consonant simply loses the विरामः – ◌्. Any consonant should conjugate with these add-ons, the Table 4 below uses ‘ त् ’ as an example.
Thus the representation of a single consonant like प is a combination of the base consonant प् and the vowel अ . This document treats प and प् interchangeably unless noted otherwise. The word कारः in Samskritam grammar denotes the sound associated with a letter or (occassionally,) a word. For example, when the vowel आ combines with any consonant an आकारः results, when the vowel उ combines with any consonant an उकारः results, and so on.

Table 4: Add-on Vowel Signs with the consonant ‘ त् ’

Add-on sign codepoint (decimal)	Add-on sign	Its conjugation with ‘ त् ’	Corresponding vowel
	–	त	अ
2366	◌ा	ता	आ
2367	◌ि	ति	इ
2368	◌ी	ती	ई
2369	◌ु	तु	उ
2370	◌ू	तू	ऊ
2371	◌ृ	तृ	ऋ
2372	◌ॄ	तॄ	ॠ
2402	◌ॢ	तॢ	ऌ
2375	◌े	ते	ए
2376	◌ै	तै	ऐ
2379	◌ो	तो	ओ
2380	◌ौ	तौ	औ
2306	◌ं	तं	अं
2307	◌ः	तः	अः

Consonants combine with the vowels to form the conjugate forms as in Table 4. Thus, with another consonant, ग् , the forms will be written: ग, गा, गि, गी, गु, गू, गृ, गॄ, गॢ, गे, गै, गो, गौ, गं, गः . There are few exceptions in writing these forms:

- र् + उ = रु
- र् + ऊ = रू
- र् + ऋ = र्ऋ
- र् + ॠ = र्ॠ
- ह् + ऋ = ह्ऋ

When two or more consonants occur successively without any intervening vowels, they are written in a conjoined form:

- Horizontal cluster (read left → right): च्च्चे
- Vertical cluster (read top → bottom): च्

The rules for making consonant clusters depend (mostly) on whether the first consonant has a vertical line from top to bottom or a short central stem from which character is suspended:

1. In a horizontal cluster, the final vertical lines of all but the last consonant are dropped and then the remaining parts are joined together: व् + य = व्य , ष् + प् + य = ष्प्य , स् + त् + वा = स्त्वा
2. Characters suspended from a central stem have several forms: ट् + ट = ट्ट, द् + द = द्द, ड् + ड = ड्ड, ल् + ल = ल्ल
3. Other combinations are handled in various ways: ट् + य = ट्य, द् + य = द्य, क् + य = क्य, क् + त = क्त . When ल् is the second consonant, it may be placed next to (ग् + ल = ग्ल) or below (क् + ल = क्ल) the first consonant.
4. Special forms: श् and र्
   (a) For श् , alternate combining form may be used: श्व, श्न, श्र, श्च etc. or श् may be retained: श्क, श्त, श्म etc. But with र it is always श्र , never as स्र.
   (b) र् has several combining forms.
      i. When र् is the second consonant:
         A. First consonant has a vertical line: प् + र = प्र, क् + र = क्र, ब् + र = ब्र , but there are special forms: त् + र = त्र, क् + र = क्ऱ.
         B. First consonant has a central stem: ट् + र = ट्र, ड् + र = ड्र etc. Note the exception: द् + र = द्र .
      ii. When र् is the first consonant: This gives rise to रेफः . Examples: र् + क = र्क, र् + म = र्म, र् + को = र्को .

There are defined consonant clusters (different from the special consonant clusters क् + ष = क्ष, ज् + ञ = ज्ञ that are part of the alphabet) like: क्क, क्ख, क्च, क्ण, ..., क्ष्म, ङ्क्त, ङ्ख्य, ..., द्ग, द्ध, द्ध, द्म, द्व्य . Upon careful observation, one can see several similarities and some anomalies in the way letters of the देवनागरी script are written. One reason is, of course, evolution of the language and the script due to socioeconomic circumstances (e.g. ease of writing). Still, one generally makes no mistake in identifying a piece of text written in some script. In other words, how humans identify a certain script and letters in it is a matter of scientific research. Describing unambiguously how to write a symbol of a script is challenging. Think of *teaching a computer* how to write, for example, क and you will perhaps appreciate the difficulty involved.
Generally speaking, a document (like this one) with देवनागरी letters that has been typeset on a computer (or in a traditional printing press), the letters (especially the combined ones) are dictated by the *font* used. Thus, all of the above letters that you see are defined by the artist(s) who created the font. The देवनागरी letters in this document use a font named Shobhika(शोभिका) which is developed by the Indian Institute of Technology Bombay, Mumbai, India.
There aren't very many punctuation marks in Samskritam. The few that are used consistently are:

1. विरामः – ् that denotes a bare consonant (without the terminal vowel अ).

2. दण्डः – । that marks the end of a sentence or the end of half a stanza: रामः गृहं गच्छति।

3. दण्डौ – ॥ that marks the end of a stanza.

According to Prof. Deshpande, in modern editions of Sanskrit texts, other English punctuation marks like ‘,’, ‘!’, and ‘?’ are found.

2.2 On Transliteration

Perhaps of all the creations of man language is the most astonishing.

–Giles Lytton Strachey [1]

Associated with every human language are sounds and symbols. A distinguishable sound is called phoneme whereas a distinguishable symbol is called grapheme or character. Every language has a script which is used to represent the characters and words in that language. The basic set of symbols of a script is its alphabet. English words, for instance, are represented by a sequence of symbols of the augmented English alphabet. The alphabet is augmented to include punctuation signs, numbers, and other symbols. These symbols are collectively referred to as the “character set” of a writing system.

A sequence of English characters (from ‘a’ to ‘z’ and from ‘A’ to ‘Z’) to represent a word (e.g. “student”) is called the spelling of that word. *Spelling* or native spelling of a word tells us how to *write the sounds* of any word in a language using the (native) script of that language so that the written communication can become possible.

Transliteration refers to the conversion of graphemes or characters or symbols from one script to another. Although the focus of transliteration is on symbols (and not on sounds), sounds are given due consideration and symbols that sound similar are chosen for conversion. For example, the देवनागरी symbol ‘र’ is typically transliterated to the English symbol ‘r’ or a pair of symbols “ra”. Such use of transliteration has been made more ubiquitous by smartphone apps (for instance in India) that provide a messaging interface that lets users *quickly* key in English spellings of their native language (e.g. Marathi, Hindi, or Samskritam) words which are seamlessly renderred in a native script like देवनागरी .

In general, as shown in Figure 2, transliteration refers to conversion of text from a *source* script to a *target* script. Thus, in transliteration, two different scripts or “character sets” are involved: a source character set and a target character set. Typically, these sets are *disjoint*, that is, there is no character (excluding trivial characters like a blank – ‘ ’) that is a member of both the character sets. It should be clear that we undertake transliteration so that you can (at least) recognize certain text that was written in an unfamiliar character set. By reading the transliterated text, you can reproduce sounds that are *close* to the *sounds* that the source text actually represents, **without knowing the symbols from the source character set**.

You may ask: “Why should transliteration be attempted at all?” It is indeed possible to take an approach like “The *native script* of any text is inseparable from its language. Therefore learn the native script to understand how that text is written and read.” and altogether remove the need for transliteration[8], but such an approach is too restrictive; transliteration facility may provide people with additional means to analyze languages and their scripts. After all, transliteration between two scripts is expected to be simpler than translation between associated languages.

We can examine the *process of transliteration* in more detail. Suppose you want to read the Samskritam sentence in देवनागरी – रामः वनम् अगच्छत्। – but you have not learned the देवनागरी script and

[8] A similar argument could also be made about the *need for translating* texts from one language into another

you are only familiar with the English alphabet[9] and a few more characters like period – '.', blank or space – ' ', colon – ':' etc. How might you *read* that sentence then?
One way to do this may be to split the sentence – let's call it the *input sentence* – into words at *word boundaries*. Each word is, in turn, a sequence of characters in the source character set. Once such "character segregation" of the input sentence is done, we can create an unambiguous, *one to one* mapping from each character to one or more target characters. Such a system, shown in Figure 2, is a simple and functional *one-way interpreter* of symbols. A one to one mapping means that *every symbol* from the source character set is associated with a unique sequence of symbols from the target character set. An illustration of such a mapping is shown in Figure 3. Our system may maintain a table of symbol mappings and simply *look up* the target symbol(s) for the source symbol that it encounters in the input sentence. Once the corresponding characters are *emitted* by our interpreter, the resulting sentence – let's call it the *output sentence* – will be automatically constructed.

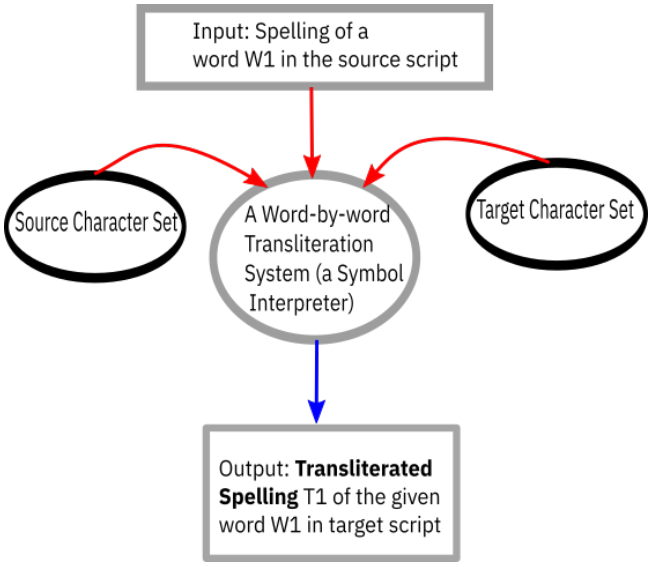


Figure 2: A One-way Transliterator

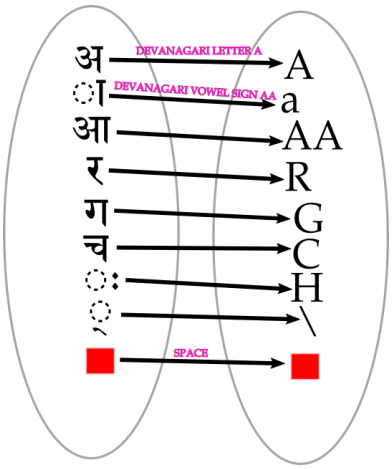


Figure 3: One to One Mapping Between Example Character Sets

Let us examine this process for our example sentence:

[9]When the target script uses the English alphabet, transliteration is often referred to as *romanization*.

- Input sentence is रामः वनम् अगच्छत्। . It is made of *exactly* 18 characters in the following order: 'र', ा, 'म', 'ः',' ', 'व', 'न', 'म', '्', ' ', 'अ', 'ग', 'च', '्', 'छ', 'त', '्', '।'
- Inspired by Figure 3 we devise a mapping in Table 6 that we look up as we deal with the input characters.
- Output sentence then becomes: raaamaH vanam\ Agacha\chhat\|

Table 6: One to One Mappings for the Running Example

Input Symbol	Output Symbol
र	ra
ा	aa
म	ma
ः	H
(blank)	(blank)
व	va
न	na
म	ma
्	\
अ	A
ग	ga
च	cha
छ	chha
त	ta
।	|
other symbols ...	omitted for brevity ...

Although our transliterator seems to work, it is rather simplistic since it just looks up characters. If the input characters were such that there is an inherent ambiguity, then our scheme based on a symbol lookup may not work reliably. Fortunately the देवनागरी characters are free from such ambiguity and contextual knowledge is not needed to perform a reliable transliteration on *any* देवनागरी text provided to our transliterator.

However, consider a reverse transliteration problem. It would be fair to expect the original देवनागरी text – रामः वनम् अगच्छत्। – back with our transliterator when it is given the input – raaamaH vanam\ Agacha\chhat\| – as shown in Figure 4.

It is not immediately clear if our lookup table based approach would behave "reversibly" as we expect. At the least, since we do *not* have mapping for characters like 'r', 'm' etc. (but only for character pairs like "ra"→ 'र' , "ma"→ 'म') that show up in the new *input sentence*, our lookups are likely to fail. Thus, at times we need to read pairs of input characters (e.g. "ra") and at other times we need to read single input characters like 'A'. It seems mandatory that we introduce a notion of *context* into our scheme in order to address the ambiguity and make our transliterator reversible, or symmetric.

A computer program is well-suited to carry out a rather informal *specification* we have laid out for transliteration. Clearly, we need to formalize our specification in order for the computer program

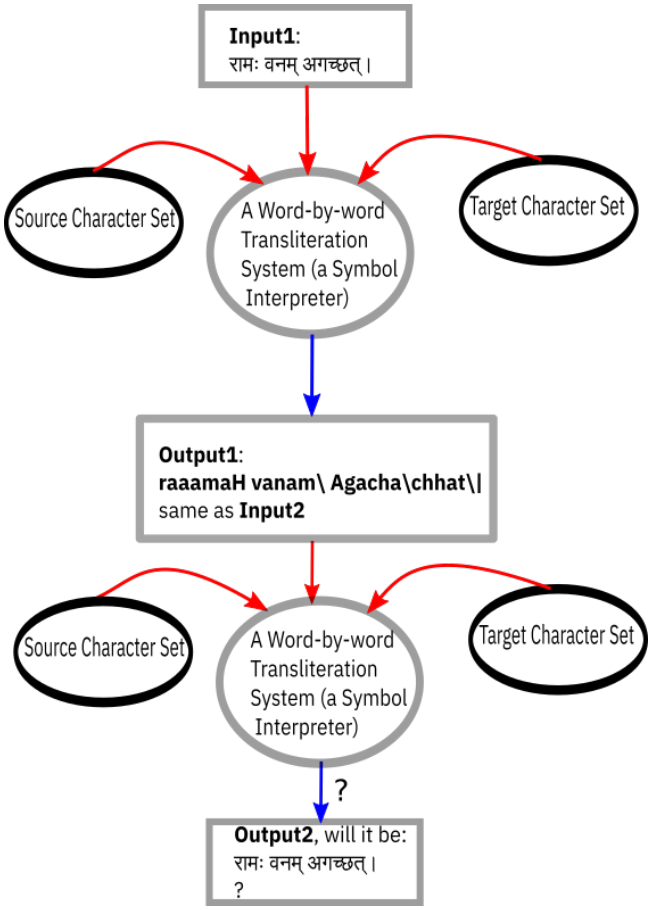


Figure 4: A Two-way Transliterator

to work reliably when it is presented with *any* देवनागरी text for transliteration that it can recreate in a two-way operation. In computer parlance, transliteration is akin to *encoding* and *decoding* which are, by definition, symmetric.
There are many popular transliteration schemes for the romanization of the देवनागरी text:

1. International Alphabet of Sanskrit Translation (IAST) [2]

2. Velthuis Transliteration (VLTH) [3]

Typeset in LaTeX this document uses the Velthuis scheme for transliteration of देवनागरी text using only English letters. In Velthuis scheme, for example, देवनागरी is transliterated as "devanaagarii". I believe that the book uses IAST transliteration scheme. Professor Deshpande asks us to transliterate between देवनागरी and English. I am going to skip that exercise here.

3 First Conjugation (गण) of Active Verbs in Present Tense

Since संस्कृत is an *inflected* language, verbs are inflected forms of their *roots*. The root of a verb is called its धातु[10] .
Conjugation means inflection (change in the form) of a word. It also means a group or class of verbs whose inflection formation follow the same rules. However, this document will use the word गण (and its plural गणाः) to refer to a group or class (or groups) of verbs and the word *conjugation* to refer to inflection. We hope that avoiding the overloading of terms helps clarity. Thus, we will use गण - १ to mean the first group of verbal roots.
Another ingredient of the (final) inflected form of a धातु is its *termination* or *ending*. There are two types of termination: active and middle. The term *active* is also overloaded in that it may refer to either the ending of a verb or the *voice* of a sentence. To aid clarity, we will use परस्मैपद to refer to active termination and आत्मनेपद to refer to middle termination (we may use the word "middle" when referring to an ending as it is not ambiguous). A धातु using परस्मैपद ending is called परस्मैपदी धातु whereas a धातु using आत्मनेपद ending is called आत्मनेपदी धातु . Some verbal roots can use either परस्मैपद endings or आत्मनेपद endings. Such a धातु is called उभयपदी धातु (note, however, that there are no उभयपदी *endings*).
A verbal root belongs to one of the 10 गणाः . Of these, the first, fourth, sixth, and tenth गणाः form a related group. In this section, we illustrate the first गण . We will generally annotate a धातु as {नाम} ({१..१०}-प।आ।उ) . For example, the भू धातु is denoted as भू (१-प) . A complete conjugation of a verbal root is a complete specification of the seven parameters from list 1. These could be thought of as *dimensions*. Some or all of the first five are specified by name and a table or matrix of 3 rows and 3 columns is formed between the remaining two where the rows belong to the person and columns belong to the number of an inflection. Such a table can be prepared for each of the धातु . In addition to this, there are affixes (प्रत्यय) that behave like nominal forms but indicate action. This is what is *grammatically* possible. Not every grammatical inflected form is used by authors in संस्कृत literature, however. But you can easily see the enormous expressive power and complexity this adds to the language. For a more complete conjugation specification, see Table 16.
It is helpful to talk about the terminations alone and present them in the tabular format described above. They suggest patterns for परस्मैपद and आत्मनेपद roots. Note that the terminations are related to whether the verb is active or middle and are independent of the गण of the root. Expository and grammar texts in संस्कृत vary in placement of rows, but the columns are always in the same order: first column – singular, second column – dual, and third column – plural. Some references show the first person (उत्तमपुरुष) forms in the first row and the third person (प्रथमपुरुष) in the third row whereas other references do the opposite. The second person (मध्यमपुरुष) forms are shown in the second row. We will adopt the **third person, second person, and first person order** ↓ in this document.
Table 8 shows the terminations of a परस्मैपदी धातु in the active voice and the present tense. We will list the same for आत्मनेपदी धातु later TODO: provide a link here . We conventionally refer to a verb by its name followed by its present tense, active voice, third person, singular form. For example: गम् - गच्छति , भू – भवति , वन्द् – वन्दते .
The general specification of the table of final verb forms is as shown in Table 10.
Table 12 shows an instance of verb form specification for the भू धातु .
Once the endings and the forms of a template धातु are known, one can predict forms of other धातवः from the same गण .

[10] The *uninflected* state (before receiving case terminations) of a noun is called its प्रातिपदिक . We will try to be consistent about the use of प्रातिपदिक in this document.

Table 8: Terminations of a परस्मैपदीधातु, कर्तरि प्रयोगे, वर्तमाने काले (लट्लकारे)

Person↓ पुरुष	Singular एकवचन	Dual द्विवचन	Plural बहुवचन
प्रथम	ति	त:	अन्ति ASK: Should this be न्ति ?
मध्यम	सि	थ:	थ
उत्तम	मि	व:	म:

Table 10: Specifying Verb Forms

<धातुनाम> – (<गणसङ्ख्या> <प।आ।उ>)
<>प्रयोगे <>लकारे (<closest English tense>)
<परस्मै।आत्मने>पदधातुरूपाणि (अप्रत्ययान्तानि)

Person ↓ पुरुष	Singular एकवचन	Dual द्विवचन	Plural बहुवचन
प्रथम Third			
मध्यम Second			
उत्तम First			

Table 12: भू – (१ प)
कर्तरि प्रयोगे लट्लकारे (Present)
परस्मैपदधातुरूपाणि (अप्रत्ययान्तानि)

Person ↓ पुरुष	Singular एकवचन	Dual द्विवचन	Plural बहुवचन
प्रथम Third	भवति	भवत:	भवन्ति
मध्यम Second	भवसि	भवथ:	भवथ
उत्तम First	भवामि	भवाव:	भवाम:

List 1: Conjugation Parameters

1. *group* or *class* of the verbal root (धातुगण) . There are 10 गणाः represented by numbers 1 through 10.
2. *termination* or *ending* of the form. There are two: active (परस्मैपद) and middle (आत्मनेपद) .
3. *tense* or *mood* of the action (लकार). In classical संस्कृत , there are 10. See 1.1.
4. *aspect*
5. *voice* of the sentence (प्रयोग). There are two: active (कर्तृप्रयोग) and passive (कर्मन्प्रयोग) ASK: is that the correct name? . There is a variant of कर्मन्प्रयोग called भावेप्रयोग .
6. *number* of agents in action (वचन). There are *three* numbers of agents: Singular (एकवचन) , Dual (द्विवचन) , and Plural (बहुवचन) . The use of Dual is *mandatory* when exactly two agents are involved.
7. *person* of the sentence (पुरुष). There are three: first (उत्तम) , second (मध्यम) , and third (प्रथम) .

3.1 Formation of Simple Sentences

Like verbs, nominal (noun, pronoun, and adjective) words have *inflected forms* that are called *cases* or *declensions*. A case in संस्कृत is विभक्ति . We shall see some details of cases in the next section (TODO: link). For now, just remember that there are 8 cases (numbered 1 through 8) each of which has a name and grammatical function. When an inflected form of a root nominal word (we have called the root word प्रातिपदिक) corresponding to a case appears in a sentence, we often say that the root nominal word *takes* that case (specified by name or number of the case) or it is *in* that case.
In कर्तृप्रयोग , the agent or subject of a sentence is in the first or the *nominative* case.
Nouns and pronouns, *except the first and second person pronouns* have one of the three genders: masculine, feminine, and neuter. The gender is purely *grammatical and unpredictable* (also see generic gender). The (third person) pronouns सः, सा, तत् roughly translate to *he, she, it* respectively. However, gender may apply to inanimate objects as well. Thus, gender is a characteristic of the word, not of what it represents.

Table 14: Pronominal roots and their nominative forms

Person	प्रातिपदिक	Gender	Singular	Dual	Plural
Third (प्रथम)	तद्	masculine	सः (he)	तौ (they two)	ते (they)
Third (प्रथम)	तद्	feminine	सा (she)	ते (they two feminine)	ताः (they all feminine)
Third (प्रथम)	तद्	neuter	तत् (it)	ते (they two neuter)	तानि (they all neuter)
Second (मध्यम)	युष्मद्	–	त्वम् (you)	युवाम् (you two)	यूयम् (you all)
First (उत्तम)	अस्मद्	–	अहम् (I)	आवाम् (we two)	वयम् (we all)

In an active voice sentence, the number and person of the agent agree with the verb. At this [preliminary] stage, the word order can be assumed to be grammatically unimportant. General

order is, however, **agent (or subject) – object – verb**.
Examples:

- अहं वदामि or वदामि अहम् – I speak.
- सा वदति or वदति सा – She speaks.

3.2 Vocabulary

Verbs of १–प गण This गण is known as the भ्वादिगण because the *template* verbal root is the भू धातु . We have said this before, but it is worth repeating: Inflected forms of a verb are based on whether the verb has active (परस्मैपदी) ending or middle (आत्मनेपदी) ending; there is no (उभयपदी) *ending*. A धातु , on the other hand, may be उभयपदी which means that its inflected forms can take either an active ending or a middle ending.
There are precise rules governing the inflections that one studies when one takes up Pa.nini's Grammar (पाणिनीय व्याकरणम्) . For now, memorization of these roots helps.

Table 15: A few १ प verbs

भू भवति	To be, to become
खाद् खादति	To eat
त्यज् त्यजति	To abandon
जि जयति	To conquer
धाव् धावति	To run
गम् गच्छति	To go
नी नयति	To carry, to take
सद् सीदति	To sit, to reside, to despair
पा पिबति	To drink
बुध् बोधति	To know
स्था तिष्ठति	To stand, to wait
वद् वदति	To speak
दृश् पश्यति	To see
वस् वसति	To dwell
स्मृ स्मरति	To remember
पत् पतति	To fall
चल् चलति	To walk
दह् दहति	To burn
धृ धरति	To hold, to keep, to support
ध्यै ध्यायति or ध्या ध्यायति	To meditate, to reflect
नद् नदति	To whisper, to rustle
नन्द् नन्दति	To rejoice, to be glad, to enjoy
नम् नमति	To salute, to bow
निन्द् निन्दति	To blame, to criticize, to reproach
पच् पचति	To cook
पठ् पठति	To read
भज् भजति	To serve, to worship (also, to divide)
यज् यजति	To sacrifice to a deity (यज्ञ)
याच् याचति	To beg, to pray
रक्ष् रक्षति	To protect, to guard
रुह् रोहति	To grow, to be born, to rise, to climb
रुध् रोधति	To grow
रक्ष् रक्षति	To protect, to guard
वाञ्छ् वाञ्छति	To expect, to desire, to wish
वप् वपति	To shave
वृष् वर्षति	To rain
व्रज् व्रजति	To go, to walk, to advance
शंस् शंसति	To praise
श्रि श्रयति	To take refuge at
श्रु श्रुणोति	To hear
शुच् शोचति	To grieve, to suffer, to moan

A Verb Conjugation Names

Verb conjugations is संस्कृत are complex. Even naming them is challenging. We found a verb conjugation engine that is indeed very useful in this regard. Table 16 shows the देवनागरी names of various verb forms (including conjugations) and their corresponding English names.

Table 16: Names of Verb Conjugations

देवनागरी नाम	English Name
तिङन्ताः	Conjugations
अप्रत्ययान्तधातुः	Primary Conjugation
लट् (लकारः)	Present (Tense)
लङ् (लकारः)	Imperfect (Past Tense)
विधिलिङ् (लकारः)	Optative (Mood)
लोट् (लकारः)	Imperative (Mood)
लृट् (लकारः)	Future (Tense)
लृङ् (लकारः)	Conditional (Future Tense)
लुट् (लकारः)	Periphrastic (Future Tense)
लिट् (लकारः)	Perfect (Past Tense)
लुङ् (लकारः)	Aorist (Tense)
आगमाभावयुक्तलुङ् (लकारः)	Injunctive (Mood)
आशिर्लिङ् (लकारः)	Benedictive[11] (Mood)
कृदन्तः (प्रत्ययः)	Participle
क्त (प्रत्ययः)	Past Passive (Participle)
क्तवतु (प्रत्ययः)	Past Active (Participle)
शतृ (प्रत्ययः)	Present Active (Participle)
शानच् कर्मणि (प्रत्ययः)	Present Passive (Participle)
लुडादेश (लुट् + आदेश) पर[12] (प्रत्ययः)	Future Active (Participle)
तव्य (प्रत्ययः)	Future Passive (Participle)
यत् (प्रत्ययः)	Future Passive (Participle)
अनीयर् (प्रत्ययः)	Future Passive (Participle)
यत् (प्रत्ययः)	Future Passive (Participle)
लिडादेश (लिट् + आदेश) पर (प्रत्ययः)	Perfect Active (Participle)
लिडादेश (लिट् + आदेश) आत्म[13] (प्रत्ययः)	Future Passive (Participle)
अव्ययः	Indeclinable
तुमुन् (अव्ययः)	Infinitive
क्त्वा (अव्ययः)	Absolutive (gerund)
क्त्वा (अव्ययः)	Absolutive (gerund)
ल्यप् (अव्ययः)	Absolutive (gerund)
ल्यप् (अव्ययः)	Absolutive (gerund)
णिच् रूपाणि	Causative Conjugation (repeat some of the above)
यङ् रूपाणि	Intensive Conjugation (repeat some of the above)
सन् रूपाणि	Desiderative Conjugation (repeat some of the above)

The classical language misses some conjugations present in the vedic language.

References

[1] Giles Lytton Strachey and George Rylands. Words and Poetry. New York: Payson and Clarke. Introduction, Page xii.

[2] Wikipedia. IAST.

[3] Wikipedia. Velthuis.

[11] Benediction: Indicating prayer or invoking divine protection
[12] परस्मैपदी धातुः
[13] आत्मनेपदी धातुः