Open-Tamil text processing tools

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Abstract:

Programmers face common problems while developing Tamil applications. We discuss a suite of open-source tools called Open-Tami [1-4], which provides solutions to commonly encountered problems in Tamil computing - code-point to letter mapping, Tamil-word-length calculation, Tamil input methods (IME) for web-based applications etc. Future plans for Open-Tamil development, licensing and algorithms involved are explained in this article. It is already used as part of production websites [5].

Introduction

Tamil word processing is very easy on a modern computer with the processing speeds, and available memory. However the variety of encoding formats used in legacy and modern systems like TSCII, TAM, TAB and modern Unicode (with UTF-8, UTF-16) formats makes it a complex space to navigate for the uninitiated. To address this problem we have developed a heterogeneous tool collection in Open-Tamil project [1], also published as a Python package [2].

Goals

Goal of this package is to collect and develop open-source licensed Tamil tools, in one location that provide the following,

1. Unicode standard tools for Tamil - provide various tools for Tamil Unicode development. Currently TSCII, UTF8 encoding tables are provided. TAB, TAM, and other layouts are planned to be added [4], and their conversion tools.

2. Access Unicode Tamil letters, vowels and consonants. Breakdown Tamil glyphs and Unicode code-points into Tamil letter representations - collation

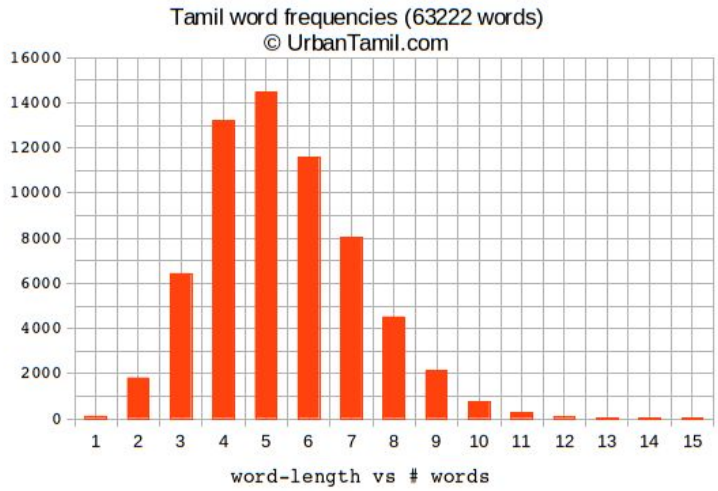
3. Tools for navigating a corpus of data, build word frequency, prediction tables etc.

4. Provide modern, unit-tested software library with open licensing

We plan to host this package as heterogeneous source, language agnostic fashion.

Examples

Open Source Tamil Tools allows you to easily carry out these operations; for example the (Python) code snippet calculates the word-frequency of a chunk of text, and (in a modified form) the word-length frequency of a free Tamil dictionary [3,5].




```
import re, operator
import tamil #open-tamil library
def print_tamil_words( tatext ):
    taletters = tamil.utf8.get_letters(tatext)
    # tamil words only
    frequency = {}
    for pos,word in enumerate(tamil.utf8.get_tamil_words(taletters)):
        print pos, word
        frequency[word] = 1 + frequency.get(word,0)
    # sort words by descending order of occurence
    for l in sorted(frequency.iteritems(), key=operator.itemgetter(1)):
        print l[0],':',l[1]
```

Plans are in place to add various encoding converters using knowledge of font-map tables [4].

Current Users

Unsurprisingly the open-tamil package is used by the author in two production websites for Tamil programming language, Ezhil, [5], and the open social Tamil dictionary, UrbanTamil, [6]. Ezhil language website uses the open-tamil for text processing in the UTF-8.

UrbanTamil website relies heavily on UTF8 processing, database search and content validation using open-tamil library.

Since the package is installed via the PIP (Python Package index) we have over 1000 downloads [7].

Development & Testing

Open-Tamil library is developed by a team of volunteers by sharing code on GitHub. This library has unit tests and uses the Travis-CI continuous integration system for regression proof development, making Open-Tamil a modern software project [8].

Currently we have the following components,

1. Python 'tamil' package as part of open-tamil
    a. Map unicode code-points to Tamil letters; basic but important parsing - in a routine called get_letters from a Tamil word
    b. Work with vowels (uyir) and consonants (mei), compound, uyir-mei letters
    c. Reverse letters in Tamil word

2. Transliterate package
    a. We support 3 transliteration modes
    b. Azhagi - phonetic maps for all Tamil letters - many -> one supporting multiple form inputs
    c. Jaffna Library - phonetic maps for all Tamil letters - one->one
    d. Combinational layout - based on phonetic mapping of vowel+consonant
3. On-screen keyboard
    a. We provide tamil99 layout for Mottie keyboard jQuery plugin [9] for web deployments. This is used in UrbanTamil website [6].
4. Language models
    a. Basic support for letter unigram, bigram models using UTF-8 based corpora are supported in the package 'ngram/' which supports unigram model at the moment. More complex language models are expected to be developed soon.
5. Examples
    a. Open-Tamil is a set of Python libraries which can help your application - web, system software, GUI on desktop etc. support Tamil text processing, inputs. Examples illustrate things like encoding conversion from TSCII to UTF-8, and other text processing.

6. Unit tests

Conclusions

Open-Tamil is an effort to bring a open source Tamil text processing programming library for software engineers and web developers. Currently we follow best practices and provide a first-class library for development. We are a volunteer effort, and accept code contributions, and idea inputs with constant effort to improve the library.

References:

1. M. Annamalai, Open-Tamil source code base, http://bit.ly/1iTTJ5V,
2. Python package for Open-Tamil, https://pypi.python.org/pypi/Open-Tamil/0.2.2-devel
3. M. Annamalai, "UrbanTamil.com + open-tamil = Tamil Vocabulary", http://ezhillang.wordpress.com/2014/04/29/urbantamil-com-open-tamil-tamil-vocabulary/
4. T. Shrinivasan, "How to get Character Map of a TTF font," http://goinggnu.wordpress.com/2014/06/26/how-to-get-character-map-of-a-ttf-font/ (2014).
5. M. Annamalai, EzhilLang.org – Tamil programming language
6. M. Annamalai, UrbanTamil.com – Social Tamil Dictionary
7. Open-Tamil Python Package index - https://pypi.python.org/pypi/Open-Tamil/0.2.4
8. Travis CI – continuous integration systems, www.Travis-CI.org
9. Tamil99 layout for Mottie keyboard jQuery-UI plugin, http://mottie.github.io/Keyboard/