

Learning Ezhil Language via Web

A. Muthiah¹ (Ph.D), M. Annamalai ² (M.Sc)

¹Boston, USA, ²Chennai, India

Abstract:

Ezhil is a Tamil programming language [1-6], with support for imperative programming, with mixed use of Tamil and English identifiers and function-names. This paper describes advances made in the year 2013-2014 on Ezhil Language platform (<http://ezhillang.org>) for learning Ezhil via the Internet, since publication of [6], and advent of contemporaneous efforts in English space like code.org, and codecademy.com. We explore the challenges and opportunities for Computer-Science education in Tamil via the Internet.

Introduction:

Ezhil has exclusively Tamil keywords, and provides built-in list, string, numeric data-types, mathematical and graphics functions, by building on the Python programming environment, as first reported in 2008, and the in 2013, generally available via the web [1-6].

In this paper we describe Ezhil effort to provide computer science access in the modern Internet environment. We discuss challenges faced during development of Ezhil project to bring to community via the Internet. We discuss the publication of Ezhil tutorial and introductory books, and challenges in the software-development.

Developments

Ezhil Web Interface

Since Tamil input to the computer is still evolving with different Input-Methods (IME) and also to exploit the pervasiveness of the global web access, and remove barriers to trying out Ezhil, (i.e. without owning a computer, or Python/Ezhil installation etc.) we have decided on a web interface to Ezhil on the lines of *tryruby.org* or *interactive python* [5a,b]. We developed a jQuery-UI based keyboard to use online [5c].

The web interface is currently hosted on <http://ezhillang.org/koodam/play/eval> our primary website [6b-c]. It includes a syntax highlighting Tamil editor with an interactive keyboard. Now you may enter your programs in the editor at the center, and click execute to see the output. Use Keywords helper for adding keywords in your program by a click. If you have a program that contains errors, it will show up in red text. You may navigate back from the results page, to source program page by clicking “Go Back” link.

We show a screenshot of an early version of the Ezhil online editor with syntax highlighting rich-text capabilities, using ACE Editor [6b-c], in Fig. 1.

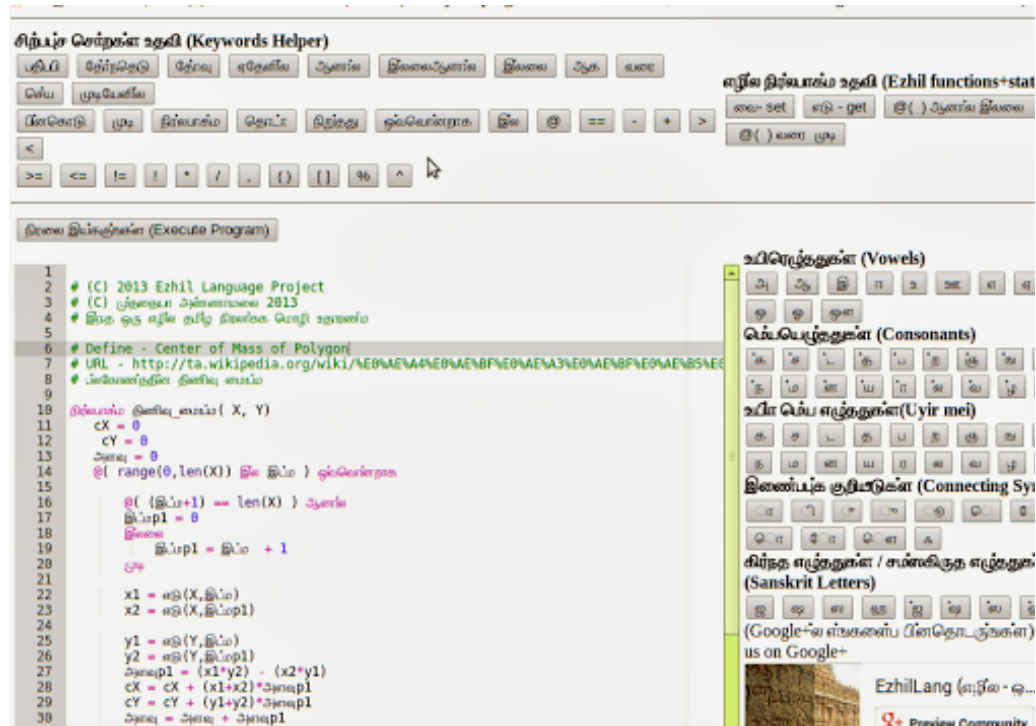


Figure. 1: Ezhil online rich-text editor and evaluator, <http://ezhillang.org/koodam/play/eval/>

Ezhil Sample Programs

A simple collection of programs in Ezhil language are provided as part of the Ezhil language test suite, and browse online at Ezhil website.

We have also added these common programs for search, sort, print, count and elementary algorithms in Ezhil, to the Rosetta database [6b]. A few of the sample programs are,

1. Hello world/Text
2. Least common multiple
3. Prime decomposition
4. Reverse a string
5. Sorting algorithms/Bubble sort
6. Towers of Hanoi
7. Temperature Conversion
8. Sum of Series
9. Sum of digits of a number
10. Ackermann function

For example the listing for sum of digits of a number program (9) is provided below,

```
# இது ஒரு எழில் தமிழ் நிரலாக்க மொழி உதாரணம்

# sum of digits of a number
# எண்ணிக்கையிலான இலக்கங்களின் தொகை

நிரல்பாகம் எண்_கூட்டல்( எண் )
    தொகை = 0
    @( எண் > 0 ) வரை
        d = எண்%10;
        பதிப்பி "digit = ", d
        எண் = (எண்-d)/10;
        தொகை = தொகை + d
    முடி
    பின்னொடு தொகை
முடி

பதிப்பி எண்_கூட்டல்( 1289)#20
பதிப்பி எண்_கூட்டல்( 123456789)# 45
```

Audio/Video training material

A Youtube video tutorial demonstrating the Ezhil Language website usage has been published [7a].

Wordpress Blog

We have setup an active blog [7b], to disseminate the updates and progress made in Ezhil Language software, course material, and books. The blog also promotes online discussion of Tamil software among likeminded programmers.

Tutorial Book

A book on the Ezhil language, in 82 pages and 10 chapters, has been completed by the author [8a], and is currently pending publication. A free version of the book can be downloaded from <http://ezhillang.org/koodam/book/register/> [8b].

Lecture-Demonstrations

We discuss details of outreach program, and resulting feedback from the targeted marketing program. In this outreach program we had a volunteer, (a computer science engineer), reach out to the Ramakrishna Mission School in Panangal Park, Chennai, Easwar Higher Secondary school in Palani, and Government Higher Secondary School in Dindugul, all schools in TamilNadu, India [9a].

Methodology

Before showing the demo to the students the genesis of Ezhil Programming Language, importance of Native Language Learning in programming, and the benefits of learning a new technical skill via native language are discussed among the 8th to 12th standard students. After the completion of small lecture about Ezhil language, a demo is shown to the students. Students are also encouraged to share their feedback and what they understand out of the session. Audio feedback is collected from a couple of students, and they are asked to frequently visit Ezhil Programming Web-page.

Feedback and Findings

1. Initially most of the teachers, students surprised – but receptive to idea - when they come to know about Ezhil Programming Language
2. Chennai city Tamil schools are reluctant to consider adoption
3. Student's technology awareness falls on a bell-curve.
4. More than 90% of the students show interest during the entire session.
5. More than 95% of the students don't know how to run programs in Linux.

However this initial feedback, however this did not result in much expected field trials [9a]. The high-school students are intelligent, and can understand the possibilities of learning programming, and that it would lead to jobs in (sic) “IT majors like Infosys and CTS” as per audio-feedback, which we shared on the Internet [9b].

Social Media Outreach

Ezhil language project has active presence on Twitter @ezhillang, Facebook and Google+ community pages. This is active source of finding new collaborators, users and insights into the Tamil community requirements [10].

Current & Future Plans

We are in process of rolling out a new online learning platform, Koodam, (shortened form of பள்ளிக்கூடம் – school) with course materials, and hyperlinked tutorials for active engagement of students. The basic evaluator and integrated text editor with highlighting is already accessible.

We are planning to run a pilot program for teaching a 4-week Ezhil programming course to students in one location. We also plan to pursue institutional sponsorship, and adoption of language in different settings.

Conclusion

This paper reviews the state of the Ezhil Programming Language, one year since going online. Ezhil language is growing fast, and provides access to several computer-science features in Tamil language.

Online access to the language via web browser breaks down barrier to learning the language. We report on one outreach program, and

We iterate some of the opportunities and challenges, and call for a broader community participation in the project to bring this technology to students that need it the most.

References:

1. M. Annamalai, “Ezhil (எழில்) : A Tamil Programming Language”, ArXiv/0907.4960 (2008).
2. Python 2.7 docs, “turtle - Turtle graphics for Tk”, <http://docs.python.org/2/library/turtle.html>
- 3a. Ezhil-Lang download page on Git-Hub: <https://github.com/arcturusannamalai/Ezhil-Lang/archive/master.zip>,
- 3b. Ezhil-Lang project homepage : <http://ezhillang.org>

4. Ezhil on Wikipedia : (Tamil) - [http://ta.wikipedia.org/wiki/எழில்_\(நிரலாக்க_மொழி\)](http://ta.wikipedia.org/wiki/எழில்_(நிரலாக்க_மொழி)), (English) - [http://en.wikipedia.org/wiki/Ezhil_\(programming_language\)](http://en.wikipedia.org/wiki/Ezhil_(programming_language))
- 5a. Try Ruby – 15 minute introduction to Ruby Language, <http://tryruby.org/levels/1/challenges/0> (accessed July, 2013)
- 5b. Interactive Python – programming lessons online, <http://interactivepython.org/> (accessed July, 2013)
- 5c. jQuery-UI based Tamil99 Keyboard layout for Mottie plugin, <http://mottie.github.io/Keyboard/>
- 6a. Ezhil Language Team, “An Introduction to Ezhil – Programming the Computer in Tamil”, INFITT, Kuala Lumpur, Malaysia (2013).
- 6b. Ezhil programs collection in Rosetta code, <http://rosettacode.org/wiki/Category:Ezhil>
- 6c. Ezhil Language online evaluator, <http://ezhillang.org/koodam/play/eval/> ; ACE – JavaScript based rich text editor customized for Ezhil language, <http://ace.c9.io/>
- 7a. (Video) “Ezhil - தமிழ் நிரல் எழுது / Write Code in Tamil! - part 1”, <https://www.youtube.com/watch?v=H8Lb5grUleU>
- 7b. (Blog) Ezhil Language Blog, <http://ezhillang.wordpress.com> (accessed 2014)
- 8a. M. Annamalai, N. Chokkan, “தமிழில் நிரல் எழுத - எழில் நிரலாக்க மொழி” (Nov, 2013).
- 8b. ibid , Download URL <http://ezhillang.org/koodam/book/register/>
- 9.a. Kannan Ramachandran, “Ezhil Language Programming Report” (Nov, 2013).
- 9.b Ezhil Language outreach student feedback 1, 2: <https://soundcloud.com/ezhil-lang/student-feedback-1> and <https://soundcloud.com/ezhil-lang/student-feedback-2>
- 9.c M. Annamalai et-al, “தமிழில் எப்படி நிரல் எழுதுவது ? - எழில் இணைய கருத்துக்கணிப்பு,” INFITT 2014, Puducherry, India.
10. Ezhil Language Social Media outreach : Twitter - @ezhillang, G+, Facebook communities