

FAST DATA STRUCTURES IN NON-C SYSTEMS LANGUAGES

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The Problem

It is a common and proven idea to build data structures (or some area of an application) using another programming language performing better and then connect those parts together. In this project, it has been tried to implement the Trie data structure in Go to be consumed in Python. The main challenge is to discover and bring it to the practice how to share codes as libraries written in Go to Python. It means, together with implementing concepts in both language, we need to go further to publish the code from Go to Python. Behind this, we analyze time complexity and space complexity for this specific Trie data structure implemented in both Go and Python to appreciate if it is reasonable to do implementation in Go or it makes sense to keep up with the pure Python.

Method

CGO is a go package that allows us to connect go to c and vice versa. Because python can import c libraries, we can export some go functions to be utilized by python. Using the CGO package, we are exporting trie implementation from go and importing it to the python.

Results

We are looking at a text that length is 599179. It is clear that pure Python implementation of trie is faster than go implementation of the same trie. However, when it comes to space complexity go implementation is less memory consuming than python implementation. (Fig. 1)

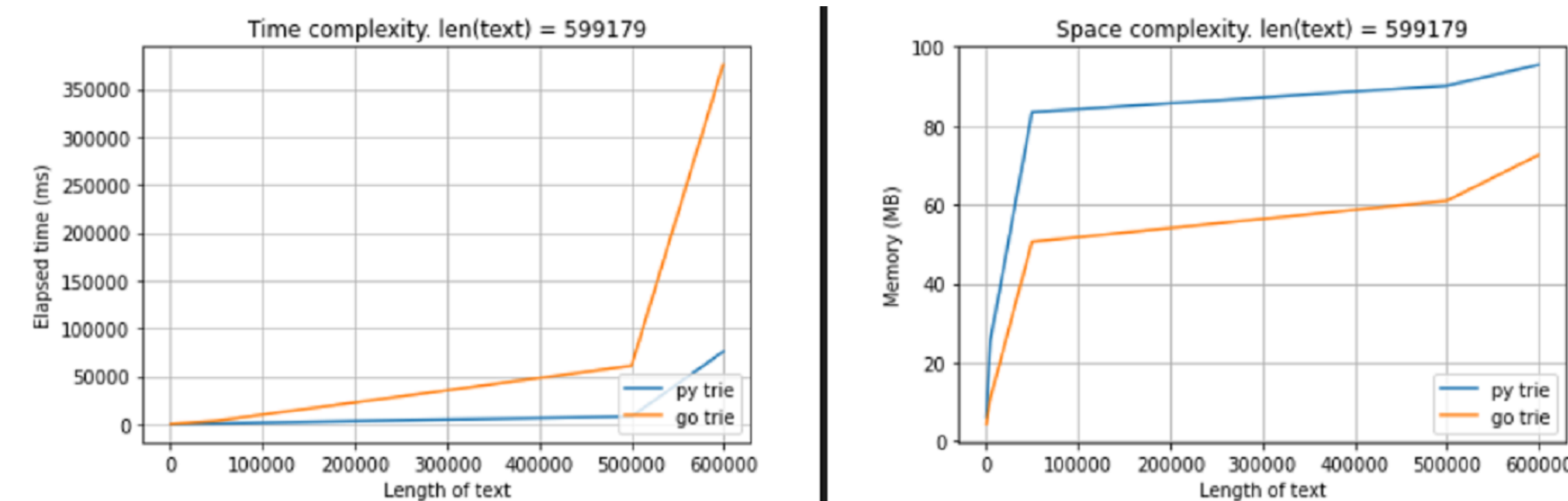


Fig. 1: Trie in Go vs Python. Time and Space complexity,

Remarks

Based on our results, we can say that the go implementation is better when python implementation when it comes to space complexity. However, we can also increase the time complexity using go implementation. For the further work, using goroutine we can increase speed of the execution time of go implementation.

References

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