Why is this imperative style faster than this functional style?

Asked 9 years, 4 months ago Modified 9 years, 4 months ago Viewed 87 times



Say we have an array that we want to find his <u>Equilibrium Index</u>, Why is imperative style faster than functional style, and what is the logic behind this algorithm (imperative's)?



1

functional style:



```
def eq_indices(list)
  list.each_index.select do |i|
    list[0...i].inject(0, :+) == list[i+1..-1].inject(0, :+)
  end
end
```

imperative style:

```
def eq_indices(list)
  left, right = 0, list.inject(0, :+)
  equilibrium_indices = []

list.each_with_index do |val, i|
   right -= val
   equilibrium_indices << i if right == left
   left += val
  end

equilibrium_indices
end</pre>
```

ruby

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asked Aug 25, 2015 at 7:36

Glubi

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not sure, but the comment seems related to the other form of imperative style... – tomsoft Aug 25, 2015 at 7:49



Because in functional style, the sum of the left and right sides is calculated from scratch for each potential equilibrium, whereas in imperative style, the sum is calculated once, and only single subtraction and addition are performed for each potential equilibrium.



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edited Aug 25, 2015 at 7:47

answered Aug 25, 2015 at 7:45



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+1 The functional version is a Shlemiel the Painter version. - Cristian Lupascu Aug 25, 2015 at 7:47 🧪

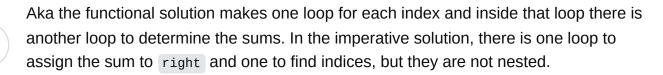
Thank you. I get why it is faster now, do you mind explaining the logic behind the imperative style solution? I'm truly baffled by it, specifically, the reason of decreasing right value per each iteration, before the equalization. - Glubi Aug 25, 2015 at 7:58 🖍

@Glubi Subtracting val from right corresponds to the fact that the equilibrium point at index i with value val is not to be included in the sum. - sawa Aug 25, 2015 at 8:02 /



In this particular instance, the difference comes from the fact that the functional style solution has $O(n^2)$, while the imperative has O(2n) = O(n).







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answered Aug 25, 2015 at 7:47



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You already have your answer, but since nobody has spelled this out clearly yet, only mentioned it implicitly, I want to make it explicit:

1



Why is imperative style faster than functional style



It isn't. The two versions don't implement the same algorithm. The performance difference is due to the difference in algorithms, not the difference in styles.

