

Why is it a bad idea to use recursion method to find the fibonacci of a number?

In computing fibonacci numbers (fib_n) using the recursion method, there would be a need to calculate and save $n-2$ prior values. So a single fibonacci call using the recursion method would make two fibonacci calls of its own, these two would make additional two and so on. This creates a very uneconomical, complex, inefficient algorithm. Fib_5 for instance would make 15 calls and Fib_4 would make 8 calls. A fibonacci call of Fib_{50} will be extremely complex and time consuming.

Niklaus Wirth in his book “Algorithms and Data Structures” discusses when recursive methods should not be used. He says, “programs in which algorithmic recursion is to be avoided can be characterized by a schema...in which values are to be computed that are defined in terms of simple recurrence relations”¹. Two examples of such schema that he gives are factorials and fibonacci sequences. He further advises to avoid recursive methods when there is a solution by iteration.

1. Niklaus Wirth (1976). Algorithms and Data Structures. Prentice-Hall Inc. 128 p.