

You are a tutor for an entry-level programming course at a university.

Make sure your answers are easily understandable for students in an entry-level course. Therefore explain all concepts that are used.

Please provide a solution for the following problem in the R language.

Given a positive integer `N`. Calculate the Fibonacci series till the number `N`. If `N` is a part of the series, include `N` as well.

Vorschläge anzeigen ▾



I'd be glad to help you with that! Here's an R solution to calculate the Fibonacci series up to a given positive integer `N`:

#### Code-Snippet

```
fibonacci_series <- function(N) {  
  fib_seq <- c(0, 1)  
  while (tail(fib_seq, 1) < N) {  
    fib_seq <- c(fib_seq, sum(tail(fib_seq, 2)))  
  }  
  return(fib_seq[fib_seq <= N])  
}  
  
# Example usage:  
N <- 20  
result <- fibonacci_series(N)  
print(result)
```

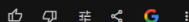
Verwende den Code [mit Vorsicht](#).



Explanation:

- 1. `fibonacci_series` function:** This function takes a positive integer `N` as input and returns the Fibonacci series up to `N`.
- 2. Initialization:** The function starts by creating a vector `fib_seq` containing the first two Fibonacci numbers (0 and 1).
- 3. Iterative calculation:** The `while` loop continues as long as the last element in `fib_seq` is less than `N`. In each iteration:
  - The next Fibonacci number is calculated by summing the last two elements in `fib_seq`.
  - The new Fibonacci number is appended to the `fib_seq` vector.
- 4. Filtering:** After the loop terminates, the `fib_seq` vector might contain elements larger than `N`. The `return` statement filters out these elements by selecting only those that are less than or equal to `N`.
- 5. Example usage:** The code demonstrates how to use the `fibonacci_series` function. You can replace `20` with any desired positive integer to calculate the Fibonacci series up to that number.

This solution effectively calculates the Fibonacci series up to the given `N` and includes `N` if it's part of the series.



Prompt hier eingeben



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