

Please consider this programming problem:

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.

Provide an example solution for the problem in the R language.

Vorschläge anzeigen ▾



Fibonacci Series in R

Understanding the Problem:

- We need to generate the Fibonacci sequence up to a given number N.
- If N is itself a Fibonacci number, it should be included.

R Solution:

Code-Snippet

```
fibonacci_series <- function(N) {  
  # Initialize the first two Fibonacci numbers  
  fib <- c(0, 1)  
  
  # Generate the series until the next number exceeds N  
  while (tail(fib, 1) <= N) {  
    fib <- c(fib, sum(tail(fib, 2)))  
  }  
  
  # Remove the last element if it's greater than N  
  if (tail(fib, 1) > N) {  
    fib <- fib[-length(fib)]  
  }  
  
  return(fib)  
}
```

Verwende den Code [mit Vorsicht](#).



Explanation:

1. **Initialization:** The function `fibonacci_series` takes the number N as input and initializes the first two Fibonacci numbers, 0 and 1.
2. **Series Generation:** The `while` loop continues as long as the last element in the series is less than or equal to N. It calculates the next Fibonacci number by adding the last two elements and appends it to the series.
3. **Removal of Excess:** After the loop, if the last element is greater than N, it's removed using `fib <- fib[-length(fib)]`.
4. **Return:** The function returns the generated Fibonacci series.

Example Usage:

Code-Snippet

```
N <- 15  
result <- fibonacci_series(N)  
print(result)
```

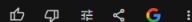
Verwende den Code [mit Vorsicht](#).



This will output:

```
[1] 0 1 1 2 3 5 8 13
```

As you can see, the series is generated up to 13, which is the largest Fibonacci number less than or equal to 15.



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