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Heute
Fibonacci Series in R
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Fibonacci Series Calculation R

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Consider the following 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.

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

Here's how you can solve the problem in R by calculating the Fibonacci series up to a given number N:

r Code kopieren

```r
fibonacci_till_N <- function(N) {
  # Initialize the first two Fibonacci numbers
  fib_series <- c(0, 1)

  # Generate Fibonacci numbers until the last number is less than or equal to N
  while (TRUE) {
    next_fib <- sum(tail(fib_series, 2))
    if (next_fib > N) {
      break
    }
    fib_series <- c(fib_series, next_fib)
  }

  # If N is in the series, include it; otherwise, return the series up to the closest smaller number
  if (N %in% fib_series) {
    return(fib_series)
  } else {
    return(fib_series[-length(fib_series)])  # Remove the last number if it exceeds N
  }
}

# Example usage
N <- 21
fibonacci_till_N(N)
```

Explanation:

- **Initialization:** The series starts with the first two Fibonacci numbers, `0` and `1`.
- **While Loop:** The loop continues to generate the next Fibonacci number until it exceeds N. If the next Fibonacci number exceeds N, the loop breaks.
- **Series Adjustment:** After exiting the loop, if N is part of the series, the entire series is returned. If N is not part of the series, the function excludes the last number, which would be greater than N, from the final result.

Example:

If you run the function with `N = 21`, the output will be:

r Code kopieren

```r
[1] 0 1 1 2 3 5 8 13 21
```

This includes the number 21, as it's part of the Fibonacci series.