

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 Python 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 provide a Python solution for calculating the Fibonacci series up to a given positive integer N , including N if it's a part of the series:

Python

```
def fibonacci_series(N):
    """Calculates the Fibonacci series up to N, including N if it's part of the series.

    Args:
        N: A positive integer.

    Returns:
        A list containing the Fibonacci series up to N.
    """

    if N <= 0:
        return []

    fib_series = [0, 1]
    while fib_series[-1] < N:
        next_fib = fib_series[-1] + fib_series[-2]
        fib_series.append(next_fib)

    # If N is not in the series, remove the last element
    if fib_series[-1] > N:
        fib_series.pop()

    return fib_series

# Example usage:
N = 13
result = fibonacci_series(N)
print(result)
```

Verwende den Code mit Vorsicht.

Explanation:

1. `fibonacci_series(N)` function:

- Takes a positive integer N as input.
- Returns a list containing the Fibonacci series up to N .

2. Base case:

- If N is less than or equal to 0, an empty list is returned as the Fibonacci series starts with 0 and 1.

3. Initialization:

- The `fib_series` list is initialized with the first two Fibonacci numbers: 0 and 1.

4. Loop:

- While the last element in `fib_series` is less than N :
 - Calculates the next Fibonacci number by adding the last two elements of `fib_series`.
 - Appends the next Fibonacci number to `fib_series`.

5. Final check:

- If the last element in `fib_series` is greater than N , it means N is not part of the series, so the last element is removed.

6. Return:

- The `fib_series` list is returned, containing the Fibonacci series up to N , including N if it's part of the series.

This code efficiently calculates the Fibonacci series and handles the case where N might not be a part of the series.

Prompt hier eingeben