

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 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 numbers up to N.  
    """  
  
    fib_series = [0, 1] # Initialize the series with the first two terms  
    while fib_series[-1] <= N:  
        next_fib = fib_series[-1] + fib_series[-2]  
        fib_series.append(next_fib)  
  
    return fib_series  
  
# Example usage:  
N = 10  
result = fibonacci_series(N)  
print(result)
```

Verwende den Code [mit Vorsicht](#).



Explanation:

- Function Definition:** The `fibonacci_series` function takes a positive integer  $N$  as input and returns a list containing the Fibonacci numbers up to  $N$ .
- Initialization:** The series starts with the first two Fibonacci numbers: 0 and 1.
- Loop:** The `while` loop continues as long as the last element in the series is less than or equal to  $N$ .
- Calculate Next Fibonacci:** Inside the loop, the next Fibonacci number is calculated by adding the last two elements of the series.
- Append to Series:** The calculated next Fibonacci number is appended to the end of the series.
- Return Series:** After the loop completes, the function returns the entire Fibonacci series.

Example usage:

- The code sets  $N$  to 10.
- The `fibonacci_series` function is called with  $N$  as input.
- The result is printed, which will be the Fibonacci series up to 10, including 10 since it's part of the series.

This code effectively calculates the Fibonacci series up to the specified  $N$ , ensuring that  $N$  is included if it's a part of the series.

Prompt hier eingeben



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