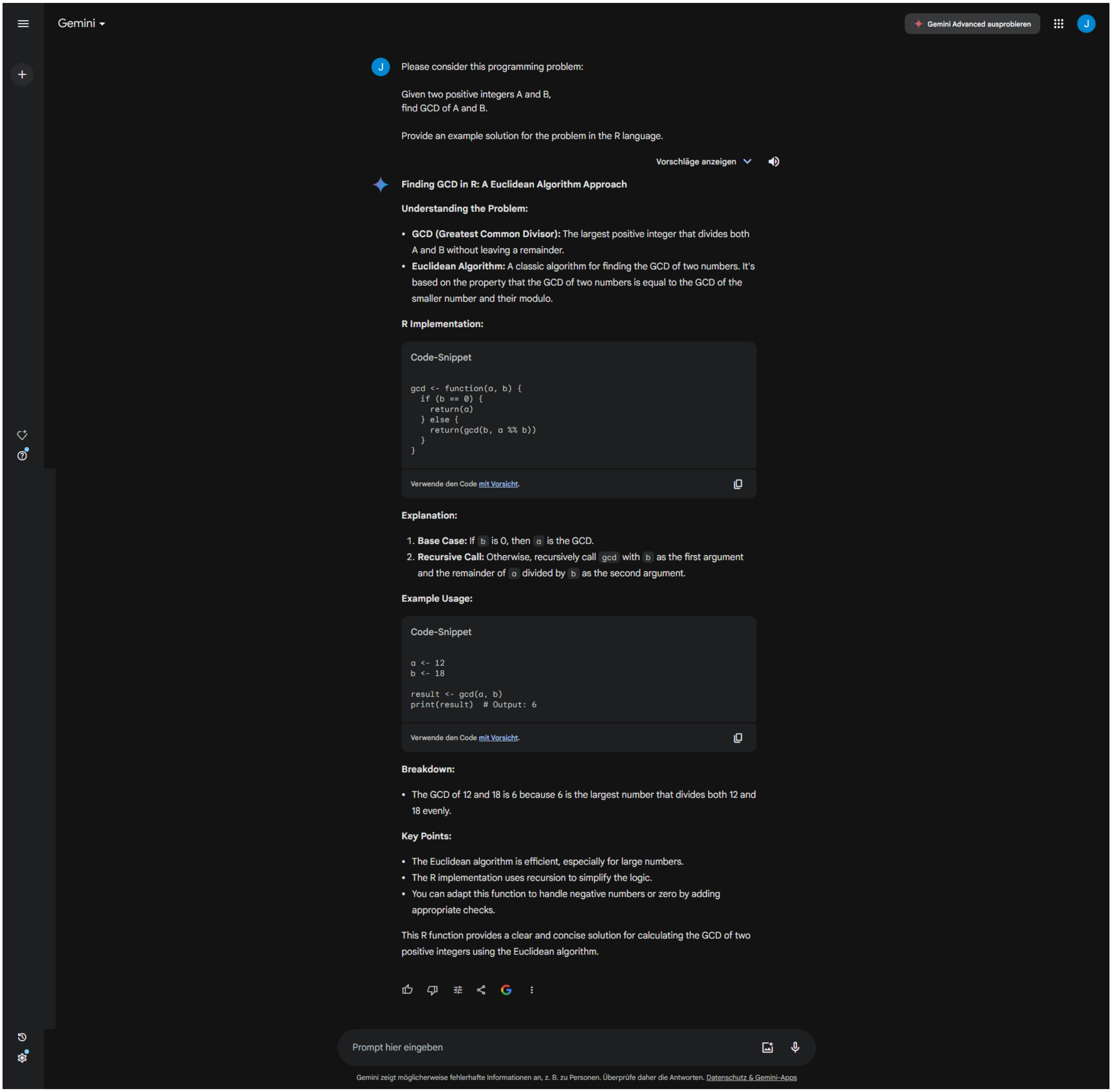

Please consider this programming problem:

Given two positive integers A and B,
find GCD of A and B.

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

Finding GCD in R: A Euclidean Algorithm Approach

Understanding the Problem:

- **GCD (Greatest Common Divisor):** The largest positive integer that divides both A and B without leaving a remainder.
- **Euclidean Algorithm:** A classic algorithm for finding the GCD of two numbers. It's based on the property that the GCD of two numbers is equal to the GCD of the smaller number and their modulo.

R Implementation:

Code-Snippet

```
gcd <- function(a, b) {
  if (b == 0) {
    return(a)
  } else {
    return(gcd(b, a %% b))
  }
}
```

Verwende den Code mit Vorsicht.

Explanation:

1. **Base Case:** If `b` is 0, then `a` is the GCD.
2. **Recursive Call:** Otherwise, recursively call `gcd` with `b` as the first argument and the remainder of `a` divided by `b` as the second argument.

Example Usage:

Code-Snippet

```
a <- 12
b <- 18

result <- gcd(a, b)
print(result)  # Output: 6
```

Verwende den Code mit Vorsicht.

Breakdown:

- The GCD of 12 and 18 is 6 because 6 is the largest number that divides both 12 and 18 evenly.

Key Points:

- The Euclidean algorithm is efficient, especially for large numbers.
- The R implementation uses recursion to simplify the logic.
- You can adapt this function to handle negative numbers or zero by adding appropriate checks.

This R function provides a clear and concise solution for calculating the GCD of two positive integers using the Euclidean algorithm.

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