

Copilot

Sure, I'd be happy to help explain that part of the program! The specific part you mentioned is the core of the algorithm used to find the Greatest Common Divisor (GCD) of two positive integers, A and B. This algorithm is known as the **Euclidean algorithm**.

Here's a detailed explanation of the specific part:

```
while B != 0:
    temp = B
    B = A % B
    A = temp
```

Step-by-Step Explanation:

1. Loop Condition (**while B != 0**):

- The loop continues to execute as long as B is not equal to 0. Once B becomes 0, the loop terminates.

2. Temporary Variable (**temp = B**):

- The current value of B is stored in a temporary variable `temp`. This is done to preserve the value of B before it gets updated in the next step.

3. Update B (**B = A % B**):

- B is updated to the remainder of the division of A by B ($A \% B$). This step is crucial as it reduces the problem size by replacing B with the remainder of the division.

4. Update A (**A = temp**):

- A is updated to the value stored in `temp` (which is the old value of B). This step effectively swaps the values of A and B for the next iteration of the loop.

Context in the Whole Program:

- The function `find_gcd(A, B)` is designed to find the GCD of two positive integers A and B using the Euclidean algorithm.
- In the `main()` function, the values of A and B are set to 56 and 98, respectively.
- The `find_gcd` function is called with these values, and the result (GCD) is stored in the variable `gcd`.
- Finally, the program prints the GCD of A and B.

Example Walkthrough:

Let's walk through the example with $A = 56$ and $B = 98$:

1. First Iteration:

- $temp = 98$
- $B = 56 \% 98 = 56$
- $A = 98$

2. Second Iteration:

- $temp = 56$
- $B = 98 \% 56 = 42$
- $A = 56$

3. Third Iteration:

- $\text{temp} = 42$
- $B = 56 \% 42 = 14$
- $A = 42$

4. Fourth Iteration:

- $\text{temp} = 14$
- $B = 42 \% 14 = 0$
- $A = 14$

The loop terminates because B is now 0, and the function returns A, which is 14. Therefore, the GCD of 56 and 98 is 14.

I hope this helps! If you have any more questions or need further clarification, feel free to ask.