

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 an integer  $N$ , find the number of divisors of  $N$  that are divisible by 3.

Certainly! Let's break down the problem and solve it step by step.

### Problem Statement:

Given an integer  $N$ , you need to find how many divisors of  $N$  are divisible by 3.

### Explanation:

- Divisor:** A divisor of a number  $N$  is any number that divides  $N$  without leaving a remainder. For example, for  $N = 12$ , the divisors are 1, 2, 3, 4, 6, and 12.
- Divisible by 3:** A number is divisible by 3 if, when divided by 3, the remainder is 0. For instance, 3, 6, 9 are all divisible by 3.

### Steps to Solve:

- Find all divisors of  $N$ :**
  - You can find divisors by checking every number from 1 to  $N$  and seeing if it divides  $N$  without a remainder.
- Count how many of these divisors are divisible by 3:**
  - For each divisor, check if it is divisible by 3. If it is, count it.

### Implementation in Python:

Here's the Python code to solve the problem:

```
python Code kopieren

def count_divisors_divisible_by_3(N):
    count = 0 # Initialize a counter for divisors divisible by 3

    for i in range(1, N + 1): # Loop through all numbers from 1 to N
        if N % i == 0: # Check if i is a divisor of N
            if i % 3 == 0: # Check if this divisor is divisible by 3
                count += 1 # If so, increase the counter

    return count # Return the final count

# Example usage:
N = 12
result = count_divisors_divisible_by_3(N)
print(f"The number of divisors of {N} that are divisible by 3 is: {result}")
```

### Explanation of the Code:

- count = 0:** We start by initializing a counter to 0. This will keep track of how many divisors of  $N$  are divisible by 3.
- for i in range(1, N + 1):** This loop goes through each number from 1 to  $N$  (inclusive).
- if N % i == 0:** This checks if  $i$  is a divisor of  $N$ . If the remainder when dividing  $N$  by  $i$  is 0, then  $i$  is a divisor.
- if i % 3 == 0:** If  $i$  is a divisor, we then check if  $i$  is divisible by 3. If it is, we increase our count by 1.
- return count:** Finally, we return the count, which is the number of divisors of  $N$  that are divisible by 3.

### Example:

For  $N = 12$ :

- Divisors of 12 are: 1, 2, 3, 4, 6, 12
- Among these, the numbers 3, 6, and 12 are divisible by 3.
- So, the output will be 3.

I hope this explanation and the code are clear! Let me know if you have any questions.

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