

To check if a credit card number is valid, you can use the **Luhn algorithm**. This is a simple checksum formula used to identify mistyped or incorrect numbers. Here's how it works:

Steps of the Luhn Algorithm

1. **Reverse the order** of the card number's digits. 2. **Double every second digit**, starting from the first digit (which is now the second digit of the reversed number). 3. If any doubled value is greater than 9, **subtract 9 from it** (alternatively, add the digits together; e.g., 12 becomes $1 + 2 = 3$). 4. **Sum all the digits** (including both doubled and undoubled digits). 5. **Check if the sum is divisible by 10**. If it is, the card number is valid.

Example

Let's check if the following card number is valid: **4539 1488 0343 6467**

1. Reverse it: **7646 3430 8841 9354** 2. Double every second digit: **7, 12, 4, 12, 6, 6, 3, 6, 8, 16, 4, 2, 9, 6, 5, 8** 3. For doubled values greater than 9 (12, 12, 16), add their digits: **7, 3, 4, 3, 6, 6, 3, 6, 8, 7, 4, 2, 9, 6, 5, 8** 4. Sum: **70** 5. Since **70 is divisible by 10**, the card number is **valid**.

Quick Check Code in Python

Here's a simple Python code to check if a credit card number is valid using the Luhn algorithm:

```
def luhn_check(card_number):
    digits = [int(d) for d in str(card_number)][::-1]
    checksum = sum(digits[0::2]) + sum(sum(divmod(2 * d, 10)) for d in
digits[1::2])
    return checksum % 10 == 0

# Example usage
card_number = "4539148803436467"
print("Valid" if luhn_check(card_number) else "Invalid")
```

This code will output whether the credit card number is valid or invalid based on the Luhn algorithm.

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