Luhn algorithm

The Luhn method, sometimes referred to as the modulus 10 or mod 10 algorithm, is a straightforward checksum technique that is used to verify a range of identifying numbers, including Canadian Social Insurance Numbers, credit card numbers, and IMEI numbers. Some mathematicians developed the LUHN formula in the late 1960s. Credit card companies quickly followed suit. Anyone can use the algorithm because it is in the public domain. The technique provides a straightforward way to separate valid numbers from typos or other errors in numbers, and it is used by the majority of credit cards and government identification numbers. Rather than hostile attacks, inadvertent errors were the target audience for its design.

Steps involved in the Luhn algorithm ->

Step 1 – Starting from the rightmost digit, double the value of every second digit

7	9	9	2	7	3	9	8	7	1	3
	x2		x2		x2		x2		x2	
	18		4		6		16		2	

Step 2 – If doubling of a number results in a two digit number i.e greater than 9(e.g., 6 × 2 = 12), then add the digits of the product (e.g., 12: 1 + 2 = 3, 15: 1 + 5 = 6), to get a single digit number

7	9	9	2	7	3	9	8	7	1	3
	x2		x2		x2		x2		x2	
	18		4		6		16		2	
	9		4		6		7		2	

Step 3 – Now take the sum of all the digits

7	9	9	2	7	3	9	8	7	1	3
	x2		x2		x2		x2		x2	
	18		4		6		16		2	
7	9	9	4	7	6	9	7	7	2	3

Step 4 – If the total modulo 10 is equal to 0 (if the total ends in zero) then the number is valid according to the Luhn formula; else it is not valid

7	9	9	2	7	3	9	8	7	1	3
	x2		x2		x2		x2		x2	
	18		4		6		16		2	
7	9	9	4	7	6	9	7	7	2	3

$7 + 9 + 9 + 4 + 7 + 6 + 9 + 7 + 7 + 2 + 3 = 70$

Since the sum is 70 which is a multiple of 10, the account number is possibly valid.

The idea is simple; we traverse from the end. For every second digit, we double it before adding it. We add two digits of the number obtained after doubling. The Luhn algorithm detects any single-digit error, as well as almost all transpositions of adjacent digits.