

Roman numeral to integer

To convert a Roman numeral string s into an integer, here's the key idea:

[Core logic:] Roman numerals are usually additive: "XII" = $10 + 1 + 1 = 12$.
But when a smaller value appears before a larger one, it's subtractive: "IV" = $5 - 1 = 4$.

[Strategy:]

- Map each symbol to its integer value.
- Iterate left to right: For each character, look ahead one character.
 - If the current value is less than the next one, subtract it.
 - Otherwise, add it.

[Example "MCMXCIV"]

Char	Value	Next Char	Next Value	Action	Result
M	1000	C	100	add	1000
C	100	M	1000	subtract	$1000 - 100 = 900$
M	1000	X	10	add	1900
X	10	C	100	subtract	$1900 - 10 = 1890$
C	100	I	1	add	1990
I	1	V	5	subtract	$1990 - 1 = 1989$
V	5	-	-	add	1994

[Helper Map:] use a hash map like:

unordered_map<char, int> roman = { {'I', 1}, {'V', 5}, {'X', 10}, {'L', 50},
{ 'C', 100}, {'D', 500}, {'M', 1000} };

[Pseudo code:] int total = 0;
for each index i from 0 to $s.length() - 1$:
 value = roman[s[i]]

if $i < s.length() - 1$ and $value < 1000000000$:

$total -= value$

else:

$total += value$