

# Number letter counts

## Problem 17

If the numbers 1 to 5 are written out in words: one, two, three, four, five, then there are  $3 + 3 + 5 + 4 + 4 = 19$  letters used in total.

If all the numbers from 1 to 1000 (one thousand) inclusive were written out in words, how many letters would be used?

NOTE: Do not count spaces or hyphens. For example, 342 (three hundred and forty-two) contains 23 letters and 115 (one hundred and fifteen) contains 20 letters. The use of "and" when writing out numbers is in compliance with British usage.

## Solution

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In [1]: ▶ ones = (0, 3, 3, 5, 4, 4, 3, 5, 5, 4, 3, 6, 6, 8, 8, 7, 7)
tens = (0, 0, 6, 6, 5, 5, 5, 7, 6, 6)
hundred = (0, 7)
thousand = (0, 8)
und = (0, 3)

def letters(n):
    s, h, t, o = n // 1000, (n % 1000) // 100, (n % 100) // 10, n % 10
    if t == 1:
        o += 10
    return (
        ones[s] +
        thousand[s != 0] +
        ones[h] +
        hundred[h != 0] +
        und[(h and (o or t)) != 0] +
        tens[t] +
        ones[o]
    )

print(sum(letters(x) for x in range(1, 1001)))
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```