

ISBN

Puzzle Description

The International Standard Book Number (ISBN) is a 13-digit code for identifying books. These numbers have a special property for detecting whether the number was written correctly.

The 1-3-sum of a 13-digit number is calculated by multiplying the digits alternately by 1's and 3's (see example) and then adding the results. For example, to compute the 1-3-sum of the number 9780921418948 we add

$$9 * 1 + 7 * 3 + 8 * 1 + 0 * 3 + 9 * 1 + 2 * 3 + 1 * 1 + 4 * 3 + 1 * 1 + 8 * 3 + 9 * 1 + 4 * 3 + 8 * 1$$

to get 120.

The special property of an ISBN number is that its 1-3-sum is always a multiple of 10.

Write a program to compute the 1-3-sum of a 13-digit number. To reduce the amount of typing, you may assume that the first ten digits will always be 9780921418, like the example above. Your program should input the last three digits and then print its 1-3-sum. Use a format similar to the samples below. Finally, your program should state whether the digits provided form a valid ISBN number.

Sample Interactive Session 1 (user input shown in *italics*)

Digit 11? *9*

Digit 12? *4*

Digit 13? *8*

Output for Sample Interactive Session 1

The 1-3-sum is 120

The ISBN number 9780921418948 is a valid ISBN number.

Sample Interactive Session 2 (user input shown in *italics*)

Digit 11? *0*

Digit 12? *5*

Digit 13? *2*

Output for Sample Interactive Session 2

The 1-3-sum is 108

The ISBN number 9780921418052 is NOT a valid ISBN number.