LAB4 Quiz
Assist. Prof. Dr. İrem ÜLKÜ

Date: 24/03/2023

The International Standard Book Number (ISBN) is a numeric commercial book identifier that is intended to be unique. The ISBN is thirteen digits long if assigned on or after 1 January 2007, and ten digits long if assigned before 2007.

For a 10-digit ISBN, each digit is multiplied by its (integer) weight, descending from 10 to 1 and the sum must be a multiple of 11.

For example, for an ISBN-10 of 0-306-40615-2:

$$s = (0 \times 10) + (3 \times 9) + (0 \times 8) + (6 \times 7) + (4 \times 6) + (0 \times 5) + (6 \times 4) + (1 \times 3) + (5 \times 2) + (2 \times 1)$$
$$= 0 + 27 + 0 + 42 + 24 + 0 + 24 + 3 + 10 + 2$$
$$= 132 = 12 \times 11.$$

Formally, using modular arithmetic, this is rendered

$$(10x_1 + 9x_2 + 8x_3 + 7x_4 + 6x_5 + 5x_6 + 4x_7 + 3x_8 + 2x_9 + x_{10}) \equiv 0 \pmod{11}.$$

For a 13-digit ISBN, each digit, from left to right, is alternately multiplied by 1 or 3, then those products are summed modulo 10.

Formally, using modular arithmetic, this is rendered:

$$(x_1 + 3x_2 + x_3 + 3x_4 + x_5 + 3x_6 + x_7 + 3x_8 + x_9 + 3x_{10} + x_{11} + 3x_{12} + x_{13}) \equiv 0 \pmod{10}.$$

For example, the ISBN-13 of 978-0-306-40615-7:

```
s=(9×1)+(7×3)+(8×1)+(0×3)+(3×1)+(0×3)+(6×1)+(4×3)+(0×1)+(6×3)+(1×1)+(5×3)+7x1
  = 9 + 21 + 8 + 0 + 3 + 0 + 6 + 12 + 0 + 18 + 1 + 15 + 7
  = 100 = 10 x 10
```

Write a C program, given the number of digits and the possible ISBN, that performs the above calculations and prints whether this possible number is an ISBN or not.

NOTE: It is recommended to subtract the '0' character when converting the character to integer data type. For example:
     char c='1';
     int a=c-'0';
In this case, the integer value of *a* is 1.

I/O Format:
Input format: Integer number and a group of characters
Output format: Text

Example:
Input:
10   → number of digits
0-306-40615-2   → possible ISBN

Output:
The sum is 132. This is ISBN

Submission:

1-Name your C source file as <student_id>.c; replace <student_id> with your student id number.

2-Upload your C file using the interface provided in e-kampüs course page.

Compiling Process

Compiling your program and to use the input file

//normal compile process
   gcc yourfilename.c -o yourprogramname

//running compiled program
   ./yourprogramname

//to use .txt file as input
   ./yourprogramname<input.txt

// to use .txt file as input and to print the results to .txt file
   ./yourprogramname<input.txt>output.txt

// to compare two files
   diff -w filename1 filename2

Please, PAY ATTENTION TO THE I/O FORMAT!