C 程式設計題

命題者：TWK

題目名稱(中文/英文)：Compute the check digit for European Article Number (EAN)

主要測試觀念： 算式計算

Basics	Decision and Loops	Functions
☐ Keywords and Identifier	☐ Programming if...else	☐ User-defined Functions
☐ Variables and Constants	☐ Programming for Loops	☐ Function Types
☐ Programming Data Types	☐ do...while Loops	☐ Programming recursion
■ Expressions	☐ break and continue	☐ Storage Class (variable life)
☐ Basic Input/Output	☐ switch...case Statement	
☐ Programming Operators	☐ Programming goto	

Arrays and Strings	Pointers	Structure and Union
☐ Arrays	☐ Pointers And Arrays	☐ Structures and Pointers
☐ Multi-dimensional Arrays	☐ Pointers And Functions	☐ Structure and Function
☐ Arrays and Functions	☐ Dynamic Memory Allocations	☐ Programming Unions
☐ Strings and Functions		

Files I/O	Miscellaneous	Other
☐ Files Input/Output basics	☐ Enumeration	☐ Programming logic training
☐ Character I/O and String I/O	☐ Preprocessor	☐ Programming structure/design training
☐ Block I/O	☐ Low level programming	
☐ Advanced File I/O manipulations	☐ Error handling	☐ Localization issues
	☐ Standard/advanced library	☐ _____

題目說明：European countries use a I3-digit code. known as a European Article Number (BAN) instead of the I2-digit Universal Product Code (UPC} found in North America. Each EAN ends with a check digit, just as a UPC does. The technique for calculating the check digit is also similar:

1. Add the second, fourth, sixth, eighth, tenth, and twelfth digits.
2. Add the first, third, fifth, seventh, ninth, and eleventh digits.
3. Multiply the first sum by 3 and add it to the second sum.
4. Subtract 1 from the total.
5. Compute the remainder when the adjusted total is divided by 10.
6. Subtract the remainder from 9.

For example, consider Gulluoglu Turkish Delight Pistachio & Coconut, which has an EAN of 869148426000. The first sum is 6+ 1+ 8+ 2+ 0+ 0 =17, and the second sum is 8+ 9+ 4+ 4+ 6+ 0 = 31. Multiplying the first sum by 3 and adding the second yields 82. Subtracting 1 gives 81. The remainder upon dividing by 10 is 1. When the remainder is subtracted from 9, the result is 8, which matches the last digit of the original code. Write a program to calculate the check digit for an

EAN.

輸入說明：例如，輸入：869148426000

輸出說明：輸出 Check digit: 8

IO 範例 ：

	Sample Input	Sample Output
第一組測資與輸出	490856921968	9
第二組	489123456786	7
第三組	569035139015	5
…		

附屬資料：

☑解答程式： ComputeCheckDigitForEAN.c(檔名)

☑測試資料：input.txt, output.txt

■ 易，僅需用到基礎程式設計語法與結構（如單迴圈等）

□ 中，需用到多項程式設計語法與結構（如雙層迴圈等）

□難，需用到多項程式結構或較為複雜之資料型態或結構（如遞迴、串連等）

解題時間：15 分鐘。

其他註記：