

1. There are n friends that are playing a game. The friends are sitting in a circle and are numbered from 1 to n in clockwise order. More formally, moving clockwise from the i^{th} friend brings you to the $(i+1)^{\text{th}}$ friend for $1 \leq i < n$, and moving clockwise from the n^{th} friend brings you to the 1^{st} friend.

The rules of the game are as follows:

Start at the 1st friend.

Count the next k friends in the clockwise direction including the friend you started at. The counting wraps around the circle and may count some friends more than once.

The last friend you counted leaves the circle and loses the game.

If there is still more than one friend in the circle, go back to step 2 starting from the friend immediately clockwise of the friend who just lost and repeat.

Else, the last friend in the circle wins the game.

Given the number of friends, n , and an integer k , return the winner of the game.

Example 1:

Input: $n = 5, k = 2$

Output: 3

Explanation: Here are the steps of the game:

- 1) Start at friend 1.
- 2) Count 2 friends clockwise, which are friends 1 and 2.
- 3) Friend 2 leaves the circle. Next start is friend 3.
- 4) Count 2 friends clockwise, which are friends 3 and 4.
- 5) Friend 4 leaves the circle. Next start is friend 5.
- 6) Count 2 friends clockwise, which are friends 5 and 1.
- 7) Friend 1 leaves the circle. Next start is friend 3.
- 8) Count 2 friends clockwise, which are friends 3 and 5.
- 9) Friend 5 leaves the circle. Only friend 3 is left, so they are the winner.

Example 2:

Input: $n = 6, k = 5$

Output: 1

Explanation: The friends leave in this order: 5, 4, 6, 2, 3. The winner is friend 1.

Constraints:

$1 \leq k \leq n \leq 500$

2. Roman numerals are represented by seven different symbols: I, V, X, L, C, D and M.

Symbol	Value
I	1
V	5
X	10
L	50
C	100
D	500
M	1000

For example, 2 is written as II in Roman numeral, just two ones added together. 12 is written as XII, which is simply X + II. The number 27 is written as XXVII, which is XX + V + II.

Roman numerals are usually written largest to smallest from left to right. However, the numeral for four is not IIII. Instead, the number four is written as IV. Because the one is before the five we subtract it making four. The same principle applies to the number nine, which is written as IX. There are six instances where subtraction is used:

I can be placed before V (5) and X (10) to make 4 and 9.

X can be placed before L (50) and C (100) to make 40 and 90.

C can be placed before D (500) and M (1000) to make 400 and 900.

Given a roman numeral, convert it to an integer.

Example 1:

Input: $s = \text{"III"}$

Output: 3

Explanation: III = 3.

Example 2:

Input: s = "LVIII"

Output: 58

Explanation: L = 50, V = 5, III = 3.

Example 3:

Input: s = "MCMXCIV"

Output: 1994

Explanation: M = 1000, CM = 900, XC = 90 and IV = 4.

Constraints:

1 <= s.length <= 15

s contains only the characters ('I', 'V', 'X', 'L', 'C', 'D', 'M').

It is guaranteed that s is a valid roman numeral in the range [1, 3999].

3. Given a string s containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.

An input string is valid if:

Open brackets must be closed by the same type of brackets.

Open brackets must be closed in the correct order.

Every close bracket has a corresponding open bracket of the same type.

Example 1:

Input: s = "()"

Output: true

Example 2:

Input: s = "()[]{}"

Output: true

Example 3:

Input: s = "]"

Output: false

Constraints:

$1 \leq s.length \leq 104$

s consists of parentheses only '()[]{}'.

4. Given a text file file.txt that contains a list of phone numbers (one per line), write a one-liner bash script to print all valid phone numbers.

You may assume that a valid phone number must appear in one of the following two formats: (xxx) xxx-xxxx or xxx-xxx-xxxx. (x means a digit)

You may also assume each line in the text file must not contain leading or trailing white spaces.

Example:

Assume that file.txt has the following content:

987-123-4567

123 456 7890

(123) 456-7890

Your script should output the following valid phone numbers:

987-123-4567

(123) 456-7890

Given a text file file.txt, print just the 10th line of the file.

Example:

5. Assume that file.txt has the following content:

Line 1

Line 2

Line 3

Line 4

Line 5

Line 6

Line 7

Line 8

Line 9

Line 10

Your script should output the tenth line, which is:

Line 10

Note:

1. If the file contains less than 10 lines, what should you output?
2. There's at least three different solutions. Try to explore all possibilities.