k-nacci Number

Problem H

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stpc();

Background

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Background Information

The Fibonacci Sequence is a sequence proposed by the Italian mathematician Fibonacci in his book *Liber Abaci*.

This sequence starts with two 1s, and the value of each term in the sequence afterwards is the sum of the previous two terms.

Here is the first 10 terms of the Fibonacci Sequence:
$\{1, 1, 2, 3, 5, 8, 13, 21, 34, 55\}$

Problem Restatement

Alice invented a new sequence based on the Fibonacci Sequence, called the k-nacci Sequence.

This sequence starts with k 1s, and the value of each term in the sequence afterwards is the sum of the previous k terms.

This is an example of the first 10 terms of the sequence when $k = 4$:
$\{1, 1, 1, 1, 4, 7, 13, 25, 49, 94, 181\}$

Problem Restatement

Given three integers a, b, k. Output the a^{th} to b^{th} elements in the k-nacci Sequence with the k from input.

Statistics

Points are given per subtask in this problem. There are 4 subtasks in this question.

Attempts: 15

0 points	5	+	3	=	8
Subtask 1 (12 points)	0	+	0	=	0
Subtask 2 (14 points)	0	+	0	=	0
Subtask 3 (16 points)	0	+	0	=	0
Subtask 4 (58 points)	0	+	0	=	0

First solved by **No one**!

Subtasks

Subtask	Score	$k \leq$	a	b
1	12	2	$= b$	$= a$
2	14	2	≤ 50	≤ 50
3	16	50	$= b$	$= a$
4	58	50	≤ 50	≤ 50

Solution

This question is a simple **simulation** question.

Create an integer array of 60 cells (referring to the criteria of *a* and *b*) to store every number in the *k*-nacci Sequence.

Set up a `for loop` to iterate the first *k* cells of the array and put 1 inside each cell.

Solution

Set up another `for loop` to iterate the remaining cells of the array.

For the i^{th} cell of the array where $i > k$, set up another `for loop` to iterate the numbers in the previous k cells to sum them up. Store the sum in a variable `sum`.

Trivially, the required loop should start from the $(i - k)^{th}$ cell and until the $(i - 1)^{th}$ cell.

Solution

Put `sum` into the current cell and reset `sum` to 0.

The outermost loop will move on to the next cell and repeat the previous operation until it ended.

Set up a `for loop` to iterate and output the a^{th} cell to the b^{th} cell of the array.

Score: 28 (Subtask 1 + Subtask 3)

Solution

#2	✕ Wrong Answer	0	
#2-1	✕ Wrong Answer 读取到 -1323752223，应为 2971215073。	3ms	536 KiB
#2-2	✕ Wrong Answer 读取到 -298632863，应为 12586269025。	2ms	536 KiB
#2-3	✓ Accepted	3ms	536 KiB
#2-4	✓ Accepted	3ms	324 KiB
#2-5	✓ Accepted	3ms	320 KiB
#2-6	✕ Wrong Answer 读取到 -1323752223，应为 2971215073。	3ms	536 KiB
#2-7	✕ Wrong Answer 读取到 -1323752223，应为 2971215073。	1ms	536 KiB
#2-8	✕ Wrong Answer 读取到 -1323752223，应为 2971215073。	3ms	324 KiB
#2-9	✕ Cancelled	0ms	0 Bytes
#2-10	✕ Cancelled	0ms	0 Bytes
#2-11	✕ Cancelled	0ms	0 Bytes
#2-12	✕ Cancelled	0ms	0 Bytes
#2-13	✕ Cancelled	0ms	0 Bytes
#2-14	✕ Cancelled	0ms	0 Bytes
#2-15	✕ Cancelled	0ms	0 Bytes

Use long long!

The divergence speed of the *k*-nacci Sequence is extremely high!

Using `long long` instead of `int` in any question is a good habit! (except for some really hard question which has limitation of memory)

Score: 100

Takeaways

1. Remember to use `long long`.
2. Be familiar with mathematical notations to understand the question well.