Problem 1414: Find the Minimum Number of Fibonacci Numbers Whose Sum Is K

Problem Information

Difficulty: Medium
Acceptance Rate: 64.78%
Paid Only: No
Tags: Math, Greedy

Problem Description

Given an integer `k`, _return the minimum number of Fibonacci numbers whose sum is equal to_`k`. The same Fibonacci number can be used multiple times.

The Fibonacci numbers are defined as:

* `F1 = 1` * `F2 = 1` * `Fn = Fn-1 + Fn-2` for `n > 2.`

It is guaranteed that for the given constraints we can always find such Fibonacci numbers that sum up to `k`.

Example 1:

Input: k = 7 **Output:** 2 **Explanation:** The Fibonacci numbers are: 1, 1, 2, 3, 5, 8, 13, ... For k = 7 we can use 2 + 5 = 7.

Example 2:

Input: k = 10 **Output:** 2 **Explanation:** For k = 10 we can use 2 + 8 = 10.

Example 3:

Input: k = 19 **Output:** 3 **Explanation:** For k = 19 we can use 1 + 5 + 13 = 19.

Constraints:

* `1 <= k <= 109`

Code Snippets

C++:

```
class Solution {
public:
int findMinFibonacciNumbers(int k) {

}
};
```

Java:

```
class Solution {
public int findMinFibonacciNumbers(int k) {

}
}
```

Python3:

```
class Solution:
def findMinFibonacciNumbers(self, k: int) -> int:
```