



# Fibonacci Modified



by PRASHANTB1984

Problem

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We define a *modified Fibonacci sequence* using the following definition:

Given terms  $t_i$  and  $t_{i+1}$  where  $i \in [1, \infty)$ , term  $t_{i+2}$  is computed using the following relation:

$$t_{i+2} = t_i + (t_{i+1})^2$$

For example, if term  $t_1 = 0$  and  $t_2 = 1$ , term  $t_3 = 0 + 1^2 = 1$ , term  $t_4 = 1 + 1^2 = 2$ , term  $t_5 = 1 + 2^2 = 5$ , and so on.

Given three integers,  $t_1$ ,  $t_2$ , and  $n$ , compute and print term  $t_n$  of a *modified Fibonacci sequence*.

**Note:** The value of  $t_n$  may far exceed the range of a 64-bit integer. Many submission languages have libraries that can handle such large results but, for those that don't (e.g., C++), you will need to be more creative in your solution to compensate for the limitations of your chosen submission language.

## Input Format

A single line of three space-separated integers describing the respective values of  $t_1$ ,  $t_2$ , and  $n$ .

## Constraints

- $0 \leq t_1, t_2 \leq 2$
- $3 \leq n \leq 20$
- $t_n$  may far exceed the range of a 64-bit integer.

## Output Format

Print a single integer denoting the value of term  $t_n$  in the modified Fibonacci sequence where the first two terms are  $t_1$  and  $t_2$ .

## Sample Input

```
0 1 5
```

## Sample Output

```
5
```

## Explanation

The first two terms of the sequence are  $t_1 = 0$  and  $t_2 = 1$ , which gives us a modified Fibonacci sequence of  $\{0, 1, 1, 2, 5, 27, \dots\}$ . Because  $n = 5$ , we print term  $t_5$ , which is 5.

Max Score: 45

Difficulty: Medium

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Java 8



```
1 import java.io.*;
2 import java.util.*;
3 import java.math.*;
4
5 public class Solution {
6
7     public static void main(String[] args) {
8
9         Scanner scan = new Scanner(System.in);
10
11         BigInteger t0 = new BigInteger(scan.next());
12         BigInteger t1 = new BigInteger(scan.next());
13         long n = scan.nextInt();
14
15         BigInteger output = new BigInteger("0");
16
17         if(n == 0){
18             System.out.println(t0);
19         }
20         else if(n == 1){
21             System.out.println(t1);
22         }
23         else{
24
25             for(int i = 2 ; i < n ; i++){
26                 output = t0.add(t1.pow(2));
27                 t0 = t1;
28                 t1 = output;
29             }
30
31             System.out.println(output);
32         }
33     }
34 }
35 }
```

Line: 23 Col: 13

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