Why So Prime?

Finding large prime numbers is not easy. And a large number of those large primes would be harder. But if someone were to ask something as ridiculous as to find their corresponding Fibonacci numbers, now that might drive you crazy.

For instance, the very next prime after, say is “100000000000031”. Looks like they(Primes) don’t even occur as often as when they were in smaller ranges, right?[1] And then the 100000000000031st Fibonacci number? A sane person would not even try to brute force it let alone find 100,000 of them.

So let’s get to it then,

Find 100,000 prime numbers (without any misses) right after . And then, get their corresponding Fibonacci numbers. Finally, why not add them together too.

P.S – How about giving the final answer modulo “1234567891011” while you are at it.

Definitions:

Let be the I’th prime number after a given value X.

Ex: (first, second, and third prime numbers after 10)

And the nth Fibonacci number.

Ex: f (0) = 0, f (1) =1, f (2) =1, and having the recursive relationship, f(n+1) = f(n)+f(n-1)

Input: (will be given line by line as below)

(see definitions)

X (10^14) ( )

N (100,000)

M - mod value (1234567891011)

Output:  
The below sum

Problem Statement:

Find,

Sample input0:

X = 100

N = 3

M = 30

Sample output0:

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Note: The large problem mentioned at the first is the final test case and will carry 60% of the marks.

**This may take a few seconds to** **run( less than a minute). If the Hackerrank gives an error due to that, get the answer on the local machine and hard code for the final test case using that answer.**

Hint [1]: How big a range do you have to check to find a given number of Primes?

Hint [2]: Read the task carefully and note the separate tasks. Optimize them one by one.