You are all very smart - being able to solve all lab problems. Here are some challenges from TAs. **Solve them to get more credits.**

Problem 1 (Medium - 1 credit):
Design an recursive algorithm to calculate Fibonacci numbers that takes only O(n) (In stead of exponential time as being proved our class).
(Hint: Using memoization)

Problem 2 (Medium - 1 credit):
Design an iterative algorithm to calculate Fibonacci numbers that takes O(n) time, and O(1) space complexity. Use it to calculate the 10,000,000 Fibonacci number. If the result is too large, give it in modulo of 1,000,000,007.

Problem 3(Hard - 1 credit):
Design an O(logn) algorithm to calculate Fibonacci numbers.