

Algorithms and Data Structures
CH08-320201
Homework 3
Fibonacci Numbers and Recurrences

Problem 3.1

- a. C++ source file
- b.

(N)	Naïve Recursive	Bottom Up	Closed Form	Matrix Multiplication
10	0	0	0	0
20	0.001	0	0	0
30	0.011	0	0	0
40	1.194	0	0.001	0
50	-	0	0.001	0
100		0.001	0	0
500		0.001	0	0
1000		0.001		0.001
5000		0.001		0.001
10000				

- c. For N greater than 40, the naïve recursive algorithm fails to return a value. For N greater than 1000, the closed form algorithm also fails to return an accurate Fibonacci sequence and for N values greater than 10,000 the remaining two algorithms also return inaccurate values for the Fibonacci sequence.

This is because the larger the number gets the algorithm cannot approximate the correct Fibonacci sequence. Because approximation loses its accuracy for the algorithms.

d.

Problem 3.2

a.