Computing Fibonacci Numbers with and without Dynamic Programming

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Chapter 1

File Index

1.1 File List

Here is a list of all files with brief descriptions:

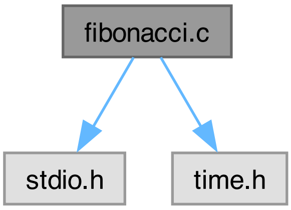
Chapter 2

File Documentation

2.1 fibonacci.c File Reference

```
#include <stdio.h>
#include <time.h>
```

Include dependency graph for fibonacci.c:



Functions

- int fibSeq1 (int n)
- int fibSeq2Helper (int n, int fibArr[ ])
- int fibSeq2 (int n)
- int main ()

2.1.1 Detailed Description

Remarks

> computation and timing of elements of the Fibonnaci sequence ∗ using the basic recurisve formula for the sequence ∗ with and without dynamic prog. ∗
>
> -

Author

Henry M. Walker ∗

-

Date

August 14, 2022 ∗

-

Remarks

References ∗

Dynamic Programming: Anany Levitin, "The Design and ∗ and Analysis of Algorithms", Second Edition, ∗ Chapter 8: Dynamic Programming ∗

Dynamic Programming: Anany Levitin, "The Design and ∗ and Analysis of Algorithms", Second Edition, ∗ Section 2.5: Example: Computing the nth Fibonacci Number ∗

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People participating with Problem/Progra Discussions: ∗ None ∗

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2.1.2 Function Documentation

2.1.2.1 fibSeq1()

```
int fibSeq1 (
                int n )
```

compute the nth fibonacci number directly, ∗ using the recursive definition of the sequence ∗

Parameters

n	the nth Fibonacci number to be computed ∗ (starting the sequence at index 0) ∗

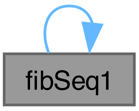
Precondition

0 <= n ∗

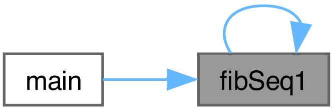
Returns

the nth Fibonacci number ∗

Here is the call graph for this function:



Here is the caller graph for this function:



2.1.2.2 fibSeq2()

```
int fibSeq2 (
                int n )
```

compute the nth fibonacci number, ∗ using the recursive definition and dynamic programming ∗

Parameters

n	the nth Fibonacci number to be computed ∗ (starting the sequence at index 0) ∗

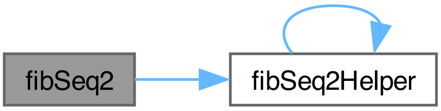
Precondition

0 <= n ∗

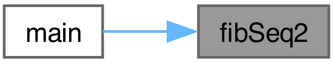
Returns

the nth Fibonacci number ∗

Here is the call graph for this function:



Here is the caller graph for this function:



2.1.2.3 fibSeq2Helper()

```
int fibSeq2Helper (
            int n,
            int fibArr[] )
```

helper function to compute the nth fibonacci number, ∗ using the recursive definition and dynamic programming ∗

Parameters

n	the nth Fibonacci number to be computed ∗ (starting the sequence at index 0) ∗
fibArr	an initialize array, recording ∗ Fibonacci numbers already computed ∗

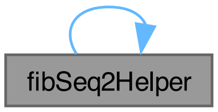
Precondition

0 <= n <= 1 + length of fibArr array ∗

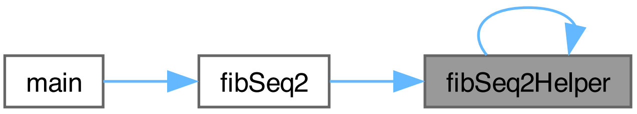
Returns

the nth Fibonacci number ∗

Here is the call graph for this function:



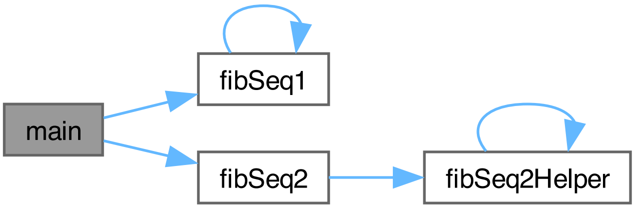
Here is the caller graph for this function:



2.1.2.4 main()

```
int main ( )
```

main procedure controls computation, timing, and printing ∗ Here is the call graph for this function:



Index