

## Data Structure & Algorithms Fibonacci Series

Fibonacci series generates the subsequent number by adding two previous numbers. Fibonacci series starts from two numbers – **F<sub>0</sub> & F<sub>1</sub>**. The initial values of F<sub>0</sub> & F<sub>1</sub> can be taken 0, 1 or 1, 1 respectively.

Fibonacci series satisfies the following conditions –

$$F_n = F_{n-1} + F_{n-2}$$

Hence, a Fibonacci series can look like this –

F<sub>8</sub> = 0 1 1 2 3 5 8 13

or, this –

F<sub>8</sub> = 1 1 2 3 5 8 13 21

For illustration purpose, Fibonacci of F<sub>8</sub> is displayed as –

1 1

1 1 2 3 5 8 13 21

### Fibonacci Iterative Algorithm

First we try to draft the iterative algorithm for Fibonacci series.

```
Procedure Fibonacci(n)
  declare f0, f1, fib, loop
```

```
set f0 to 0
set f1 to 1

display f0, f1

for loop ← 1 to n

    fib ← f0 + f1
    f0 ← f1
    f1 ← fib

    display fib
end for

end procedure
```

To know about the implementation of the above algorithm in C programming language, click [here](#) .

## Fibonacci Recursive Algorithm

Let us learn how to create a recursive algorithm Fibonacci series. The base criteria of recursion.

```
START
Procedure Fibonacci(n)
    declare f0, f1, fib, loop

    set f0 to 0
    set f1 to 1

    display f0, f1

    for loop ← 1 to n

        fib ← f0 + f1
        f0 ← f1
        f1 ← fib

        display fib
    end for

END
```

To see the implementation of above algorithm in c programming language, click [here](#) .