

# COS 102:

## Problem Solving Assignment

### Group 7: Fibonacci Sequence Generator

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**Course:** COS 102 – Problem Solving

**Submission Date:** April 17, 2025

#### 1. UNDERSTANDING THE PROJECT

##### Problem Statement:

Generate the first **N** numbers of the Fibonacci sequence.

The **Fibonacci sequence** is a series of numbers where each number is the sum of the two preceding ones, usually starting with 0 and 1, The sequence looks like this:

**0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...**

#### 2. Pseudocode

Using for loop

Input: N (number of Fibonacci terms to generate)

Output: First N numbers in the Fibonacci sequence

```
Begin
  If  $N \leq 0$ 
    Print "Invalid input"
    Exit
  Endif
```

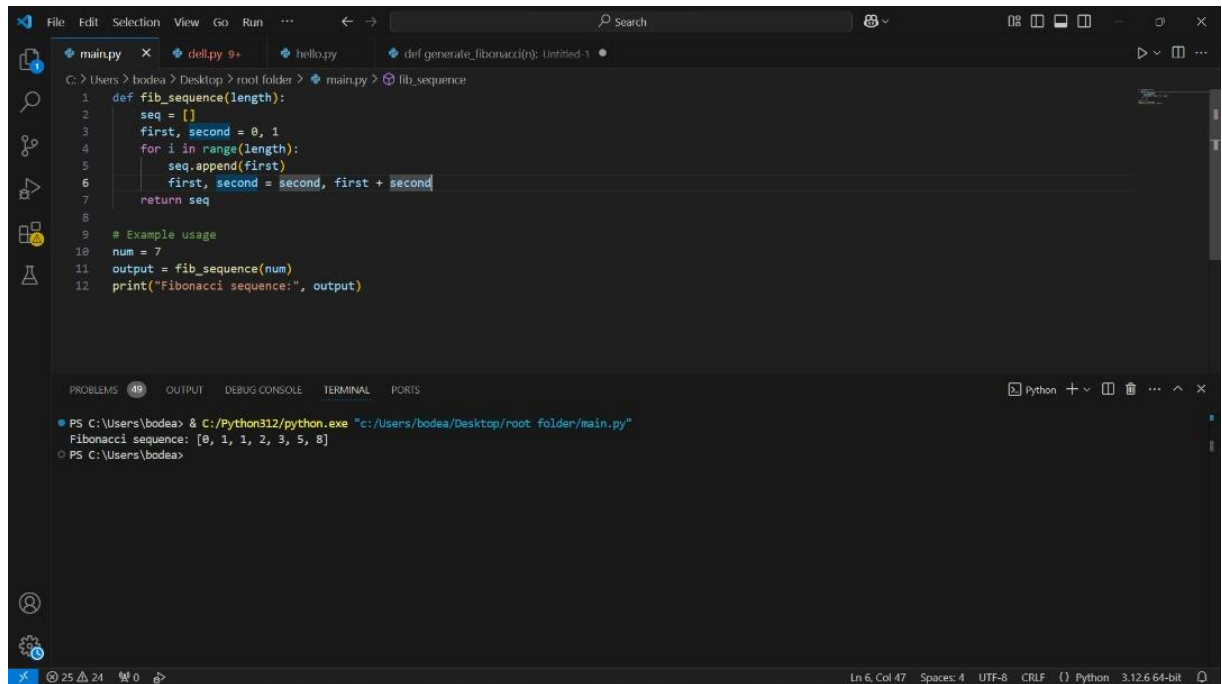
```
Initialize  $a = 0, b = 1$ 
```

```
For  $i$  from 1 to  $N$ 
  Print  $a$ 
   $temp = a + b$ 
   $a = b$ 
   $b = temp$ 
End For
End
```

### 3. Flowchart

REMAINS THIS

### 4. Python Code Implementation



The screenshot shows a Python IDE with a file named `main.py` open. The code defines a function `fib_sequence` that takes a length and returns a list of Fibonacci numbers. It also includes an example usage where the function is called with `num = 7` and the result is printed. The output window shows the execution of the script, displaying the Fibonacci sequence for `num = 7` as `[0, 1, 1, 2, 3, 5, 8]`.

```
1 def fib_sequence(length):
2     seq = []
3     first, second = 0, 1
4     for i in range(length):
5         seq.append(first)
6         first, second = second, first + second
7     return seq
8
9 # Example usage
10 num = 7
11 output = fib_sequence(num)
12 print("Fibonacci sequence:", output)
```

PROBLEMS 49 OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\bodea> & C:/Python312/python.exe "c:/Users/bodea/Desktop/root\_folder/main.py"

Fibonacci sequence: [0, 1, 1, 2, 3, 5, 8]

PS C:\Users\bodea>

### 5. Test Cases and Evaluation

Test Case	Input (N)	Output
TC1	1	[0,]
TC2	7	[0, 1, 1, 2, 3, 5, 8]
TC3	4	[0, 1, 1, 2]
TC4	0	INVALID INPUT