Write a python program to find sequence of a numbers in Fibonacci series?

◆ **What is Fibonacci?**

The Fibonacci sequence is:

0, 1, 1, 2, 3, 5, 8, 13, ...

Formula:

$F(n)=F(n-1)+F(n-2), F(0)=0, F(1)=1$

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1. Using a Loop (Iterative Method) ✅ (Most common)

```python
def fibonacci_iterative(n):
    a, b = 0, 1
    sequence = []
    for _ in range(n):
        sequence.append(a)
        a, b = b, a + b
    return sequence


# Example
print(fibonacci_iterative(10))
# Output: [0, 1, 1, 2, 3, 5, 8, 13, 21, 34]
```

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2. Using Recursion

```python
def fibonacci_recursive(n):
    if n <= 1:
        return n
    return fibonacci_recursive(n-1) + fibonacci_recursive(n-2)


n = 10
sequence = [fibonacci_recursive(i) for i in range(n)]
```

```
print(sequence)
```

⚠️ Not efficient for large n (exponential time complexity).

3. Using Generator (Memory Efficient)

```python
def fibonacci_generator(n):
    a, b = 0, 1
    for _ in range(n):
        yield a
        a, b = b, a + b

print(list(fibonacci_generator(10)))
```

👉 Best if you want to iterate lazily (without storing all values in memory).