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Assignment No:1

Write a program non-recursive and recursive program to calculate Fibonacci numbers and analyse their time and space complexity.

CODE:

```
#include <iostream>
 using namespace std;

// Recursive function to calculate Fibonacci number at position n
int fibonacci(int n) {
if (n <= 1) return n;
return fibonacci(n - 1) + fibonacci(n - 2);
}

int main() { int n;

// --- Iterative Method ---
cout << "Fibonacci Series in C++ Without Using Recursion (Iterative):\n";
cout << "Enter the number of terms: ";
cin >> n;

int t1 = 0, t2 = 1, nT;

cout << "Fibonacci Series: ";
for (int i = 1; i <= n; ++i) {
cout << t1 << " ";
 nT = t1 + t2;
t1 = t2;
t2 = nT;
}

// --- Recursive Method --- int p;
cout << "\n\nFibonacci in C++ Using Recursion:\n";
cout << "Enter the position (n): ";
cin >> p;

cout << "Fibonacci number at position " << p << " is: " << fibonacci(p) << endl;

return 0;
}
```

OUTPUT:

```
(base) sspm@sspm:~$ g++ daa1.cpp
 (base) sspm@sspm:~$ ./a.out
Fibonacci Series in C++ Without Using Recursion (Iterative):
Enter the number of terms: 14
Fibonacci Series: 0 1 1 2 3 5 8 13 21 34 55 89 144 233
Fibonacci in C++ Using Recursion:
Enter the position (n): 8
Fibonacci number at position 8 is: 21
```