

```
1  /*
2  Task 4: Recursive Functions
3  Implement a recursive function for calculating Fibonacci numbers.
4  Compare recursive vs. iterative implementations for Fibonacci and analyze
5  performance.
6  */
7  #include <iostream>
8  #include <chrono>
9  using namespace std;
10 using namespace std::chrono;
11
12 // Recursive Fibonacci
13 int fibonacci_recursive(int n) {
14     if (n ≤ 1) return n;
15     return fibonacci_recursive(n - 1) + fibonacci_recursive(n - 2);
16 }
17
18 // Iterative Fibonacci
19 int fibonacci_iterative(int n) {
20     if (n ≤ 1) return n;
21
22     int a = 0, b = 1, c;
23     for (int i = 2; i ≤ n; i++) {
24         c = a + b;
25         a = b;
26         b = c;
27     }
28     return b;
29 }
30
31 int main() {
32     int n = 10;
33
34     // Recursive Fibonacci
35     cout << "Recursive Fibonacci(" << n << "): " << fibonacci_recursive(n) <<
endl;
36
37     // Iterative Fibonacci
38     cout << "Iterative Fibonacci(" << n << "): " << fibonacci_iterative(n) <<
endl;
39
40     return 0;
41 }
42
```