

Competetive Programming

Week2-Monday

Assignment-2.4

Dynamic Programming

Code:

```
import java.util.Scanner;

public class FibonacciMemoization {

    static int[] memo;

    static int fib(int n){

        if (n == 0)
            return 0;

        if (n == 1)
            return 1;

        if (memo[n] != -1)
            return memo[n];

        memo[n] = fib(n - 1) + fib(n - 2);

        return memo[n];
    }

    public static void main(String[] args){

        Scanner sc = new Scanner(System.in);

        int n = sc.nextInt();

        memo = new int[n + 1];

        for (int i = 0; i <= n; i++)
            memo[i] = -1;

        System.out.println(fib(n));

        sc.close();
    }
}
```

The screenshot shows the Programiz Online Java Compiler interface. At the top, there is a navigation bar with various tabs like 'canvas log', 'Canvas Acc...', 'Week 2-3...', 'chatgpt...', 'Time Com...', 'Search - M...', 'online java...', 'Online Java...', 'github - S...', and 'Nandith...'. Below the navigation bar, the URL 'programiz.com/java-programming/online-compiler/' is displayed. The main area features the Programiz logo and the text 'Online Java Compiler'. On the left, there is a sidebar with icons for different programming languages: Python, C/C++, C, C++, C#, JS, TS, and Go. The central part of the interface has a code editor titled 'FibonacciMemoization.java' containing Java code for calculating Fibonacci numbers using memoization. The code includes imports for java.util.Scanner, class definitions for FibonacciMemoization, and a main method that reads an integer from standard input, calculates the nth Fibonacci number using memoization, and prints the result to standard output. The output window shows the results for n=10 and n=55, followed by a success message. A 'Run' button is located at the top of the code editor.

```
1- import java.util.Scanner;
2- public class FibonacciMemoization {
3-     static int[] memo;
4-     static int fib(int n) {
5-         if (n == 0)
6-             return 0;
7-         if (n == 1)
8-             return 1;
9-         if (memo[n] != -1)
10-             return memo[n];
11-         memo[n] = fib(n - 1) + fib(n - 2);
12-         return memo[n];
13-     }
14-     public static void main(String[] args) {
15-         Scanner sc = new Scanner(System.in);
16-         int n = sc.nextInt();
17-         memo = new int[n + 1];
18-         for (int i = 0; i <= n; i++)
19-             memo[i] = -1;
20-         System.out.println(fib(n));
21-         sc.close();
22-     }
23- }
```

Output

10
55
== Code Execution Successful ==