Climbing Stairs (70)

$f(n) = f(n-1) + f(n-2)$

Top-Down code. ($n \leq 45$) given.

```
public:
    vector <int> dp = vector <int> (46, 0);

    int climbStairs ( int n ) {
        if (n == 1) return 1;
        else if (n == 2) return 2;
        else if ( dp[n] != 0 ) return dp[n];
        else {
            dp[n] = climbStairs (n-1) + climbStairs
                                        (n-2);
            return dp[n];
        }
    }.
```

($n \geq 2$)

Bottom up

```
int climbStairs ( int n ) {
    vector <int> v (n+1, 0)
    v[0] = 1 ;
    v[1] = 1 ;
    for ( int i = 2 ; i < n+1 ; i++ ) {
            v[i] = v[i-1] + v[i-2];
        }
    return v[n];
}.
```