```java
private static int count =0;
    private static int count_dp =0;
    private static int count_M =0;
    private static HashMap<Integer,Integer> memo = new HashMap<>();



    public static void main(String[] args) {
//        SpringApplication.run(ApiGatewayApplication.class, args);

        int result = fib(10);
        System.out.println("result " + result);
        System.out.println("recursive count = " + count);


        int result2 = fibWithDynamicProg(10);
        System.out.println("result dp " + result2);
        System.out.println("recursive count for dp = " + count_dp);


        int result3 = fibWithMemoization(10);
        System.out.println("result Memo " + result3);
        System.out.println("recursive count for Memo = " + count_M);
    }




    public static int fibWithDynamicProg(int n) {

        count_dp++;

        if (n <= 1) {
            return n;
        }

        int[] dp = new int[n + 1];
        //initialization condition
        dp[0] = 0;
        dp[1] = 1;

//        [ 0,1,2        ]
```

```
        for (int i = 2; i <= n; i++) {
            dp[i] = dp[i - 1] + dp[i - 2];
        }

        return dp[n];
    }

    public static int fib(int n) {

        count++;

        if (n <= 1) {
            return n;
        }

        return fib(n - 1) + fib(n - 2);
    }



    public static int fibWithMemoization(int n) {

        count_M++;

        if (n <= 1) {
            return n;
        }

        if (memo.containsKey(n)) {
            return memo.get(n);
        }

        int result = fibWithMemoization(n - 1) + fibWithMemoization(n - 2);
        memo.put(n, result);
        return result;
    }
```