2.1 Programming Challenges

2.1.1 Fibonacci Number

Fibonacci Number Problem
Compute the n-th Fibonacci number.

Input: An integer n.
Output: n-th Fibonacci number.

$$F_n = F_{n-1} + F_{n-2}$$

Fibonacci numbers are defined recursively:

$$F_n = \begin{cases} n & \text{if } n \text{ is 0 or 1} \\ F_{n-2} + F_{n-1} & \text{if } n \geq 2 \end{cases}$$

resulting in the following recursive algorithm:

```
FIBONACCI(n):
if n ≤ 1:
  return n
else:
  return FIBONACCI(n − 2) + FIBONACCI(n − 1)
```

Input format. An integer n.

Output format. F_n.

Constraints. $0 \leq n \leq 45$.

Sample 1.

Input:

```
3
```

Output:

```
2
```

Sample 2.

Input:

```
10
```

Output:

```
55
```

Time and memory limits. When time/memory limits are not specified, we use the default values specified in Section 1.3.1.