Problem Set 4 Exercise #22: Conway Sequence

Reference: Lecture 12 notes

Learning objective: Recursion

Estimated completion time: 15 minutes

Problem statement:

[CS1101 AY2007/08 Semester 1 Exam, Q11]

The Conway's recursive sequence is defined by the following recurrence relation for a positive integer **n**.

$$a(n) = \begin{cases} 1 & if\ n \in \{1, 2\} \\ a\big(a(n-1)\big) + a\big(n - a(n-1)\big) & otherwise \end{cases}$$

Write a static recursive function

```
int a(int n)
```

that takes a positive integer **n** and returns **a(n)** .

Write a program **conway.c** for the above task. You should **NOT** use any loop structures (*for*, *while* or *do-while* loop) in your program.

Sample run #1:

```
Enter n (n > 0): 1
a(n) = 1
```

Sample run #2:

```
Enter n (n > 0): 6
a(n) = 4
```

Sample run #3:

```
Enter n (n > 0): 10
a(n) = 6
```