

Problem Set 4 Exercise #20: 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 .

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

Write a static recursive method

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

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

Write a program **PS4_Ex20_Conway.java** 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
```