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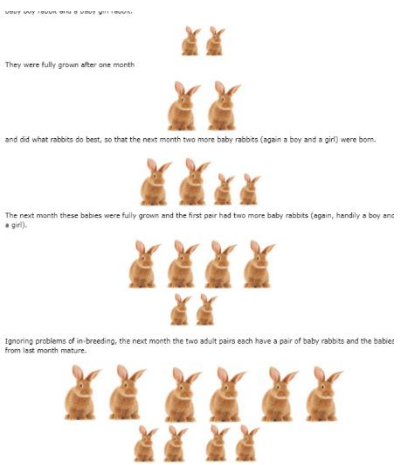
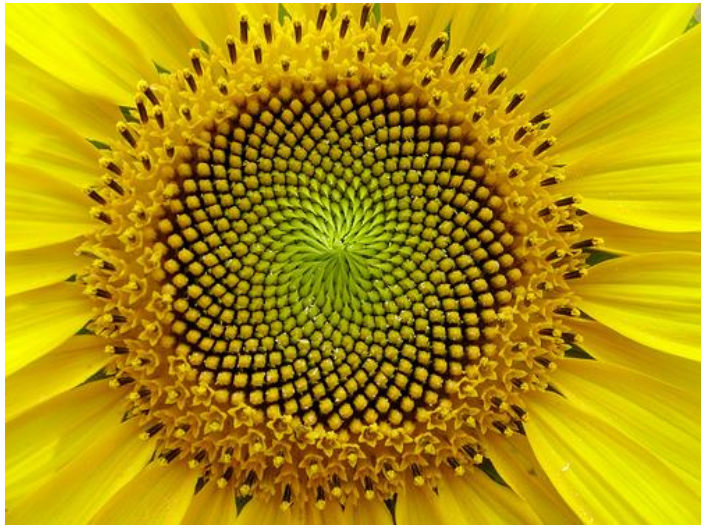
Week 2 – Day 2, Session 2

Fibonacci sequence

- Fibonacci: 13th century scholar
  - posed a question: *Suppose that it takes 2 months for a pair of rabbits to begin to reproduce, and thereafter, they produce 1 pair of rabbits per month. If we start with 1 pair of rabbits, how many pairs are there after 6 months?*
  - Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21, .
- Observation: each number is the sum of the previous two.

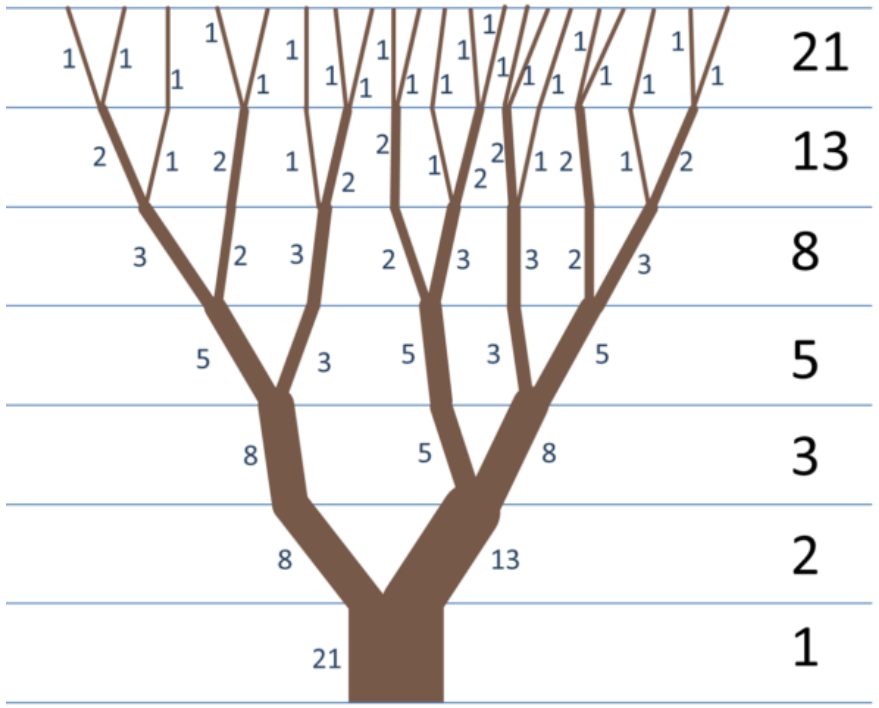


Fibonacci numbers in nature



http://www.flickr.com/photos/lucapost/694780262/

The number of spirals in each direction is always 2 consecutive Fibonacci numbers



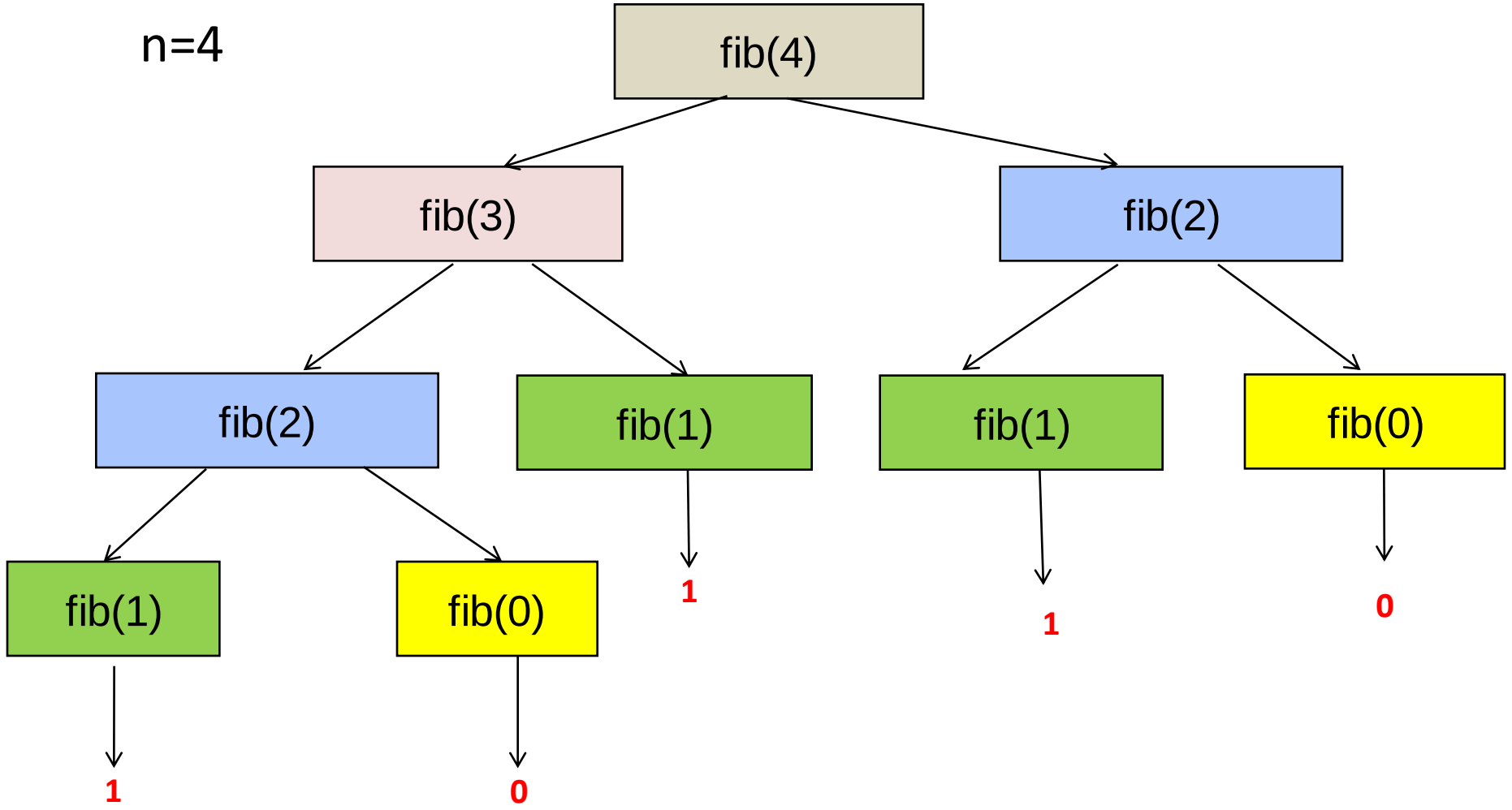
https://stemettes.org/zine/articles/fibonacci-in-nature/

Example - fib

Fibonacci sequence:

n = 0,1, 2, 3, 4, 5, 6, 7, 8....

fib(n) = 0,1, 1, 2, 3, 5, 8, 13, 21, ...



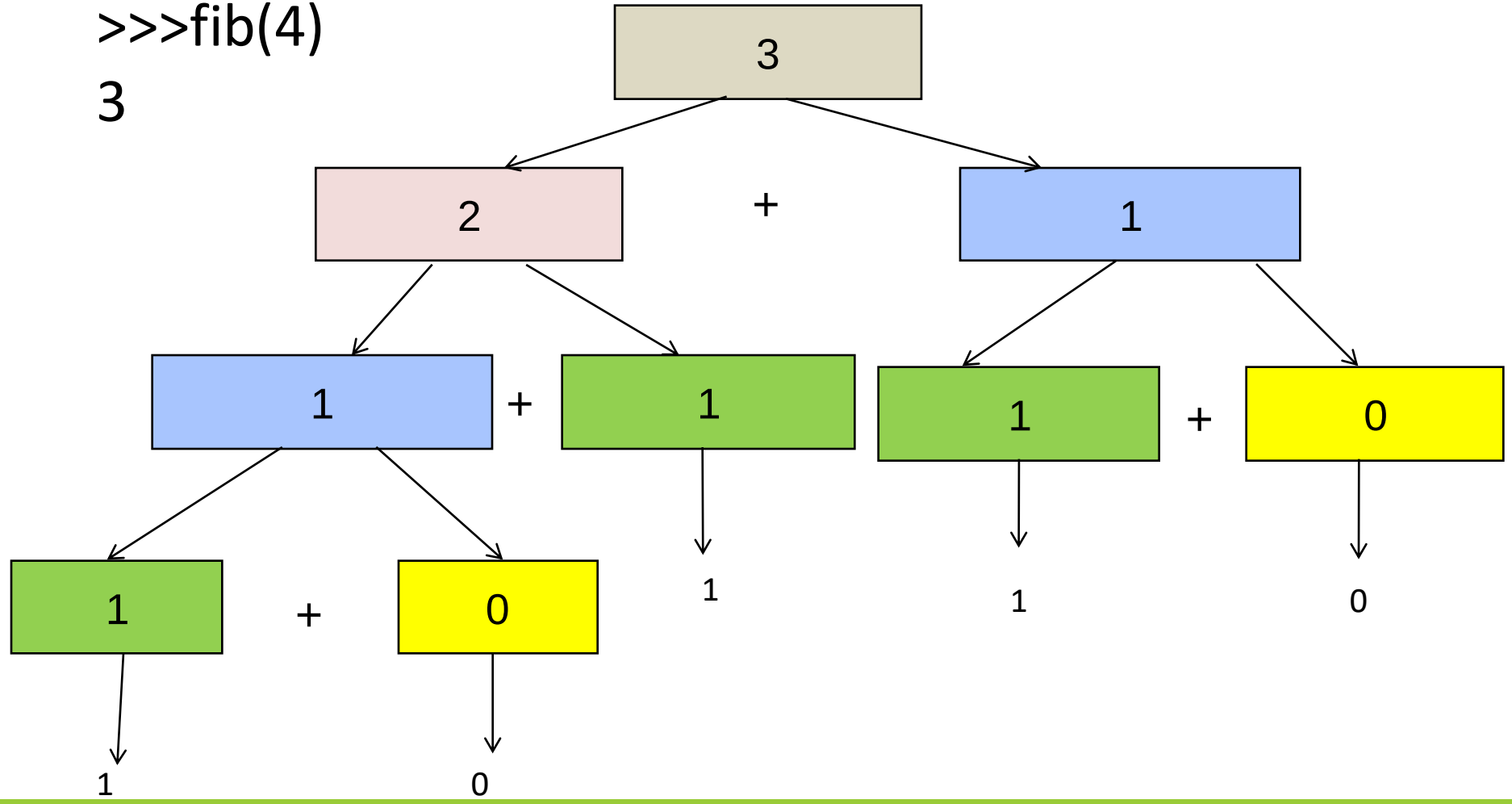
Example - fib

Fibonacci sequence:

n = 0, 1, 2, 3, 4, 5, 6, 7, 8 ....

fib(n) = 0, 1, 1, 2, 3, 5, 8,13, 21, ...

```
>>>fib(4)
3
```



Computing the Fibonacci numbers

```
 n      = 0, 1, 2, 3, 4, 5, 6,  7,  8, ...
fib(n) = 0, 1, 1, 2, 3, 5, 8, 13, 21, ...
```

```
def fib(n):
    """ Compute the nth Fibonacci number"""
        if n==0:
            return 0
        elif n == 1:
            return 1
        else:
            return fib(n-1) + fib(n-2)
```