Functions , mathematical kind

- A **relation** that gives exactly **one unique output for each input**

x → Rule → y :this is a function as you always get one answer

x → Rule → a, b, c :Not a function as you get multiple answers

- Representation
  - f(x) = 2x+1 : this is a function
  - g(x) = ± 3x : this is **not** a function , why?
- Follow up reading (optional): pg 11-13 : functions

Evaluating functions

- Solving
  - Substitute variables with numerals
  - Evaluate
    - Follow PEMDAS/BODMAS
- Solve for x = 0,1,2,3
  - $f(x) = 3x + 1$
  - $g(x) = 2x^2 + 3$
  - $h(x) = x^2 + 2x + 1$

Recursive Functions

- Functions calling themselves

Fibonacci numbers	$fib: \mathbb{N} \to \mathbb{N}$ $fib(n) = \begin{cases} 0, & \text{if } n = 0 \\ 1, & \text{if } n = 1 \\ fib(n-1) + fib(n-2), & \text{if } n \geq 2. \end{cases}$
Factorial	**fact(n) = n * fact(n-1)** {given, *fact(1) = fact(0) =1}*
Lucas numbers (*same rule as Fibonacci but with different starting values*)	**l (n) = l(n-1) + l(n-2)** {given , *l(0) = 2, l(1) = 1}*

- Evaluate for 'n' = 2 , 4, 5, 6
- Follow up reading (optional): nested functions visualized

Programming, , Test #1

- Need to know
  - Data types
  - Conditionals : If/else
  - Loops : for
  - Arrays : 2 dimensional
- Practice
  - Arrays- DS (Hackerrank)
    - Do the 4 problems marked “easy”
    - Optional :“hard”, “medium” one are for extra challenge