

# Math 451

Q's /  $\boxed{n}$

if  $n$  is even  $\rightarrow n/2$

if  $n$  is odd  $\rightarrow 3n+1$

$3 \rightarrow 10 \rightarrow 5 \rightarrow 16 \rightarrow 8 \rightarrow 4 \rightarrow 2 \rightarrow \boxed{1}$

20  
3 - 10 32  
5 - 16  
8  
4  
2  
1

given  $k$ -points data  $\rightarrow$  make all poly's approx

terms:  $1, 2, 3, \dots, k$

least squares fit      polynomial interpolant

data ? example data?

① data from a known function

Note: `vander()` in Matlab

does not have `vander(n, k)` like octave

② know function date (+) randomness

③ pick it yourself  $input(x)$   
or  
get real data

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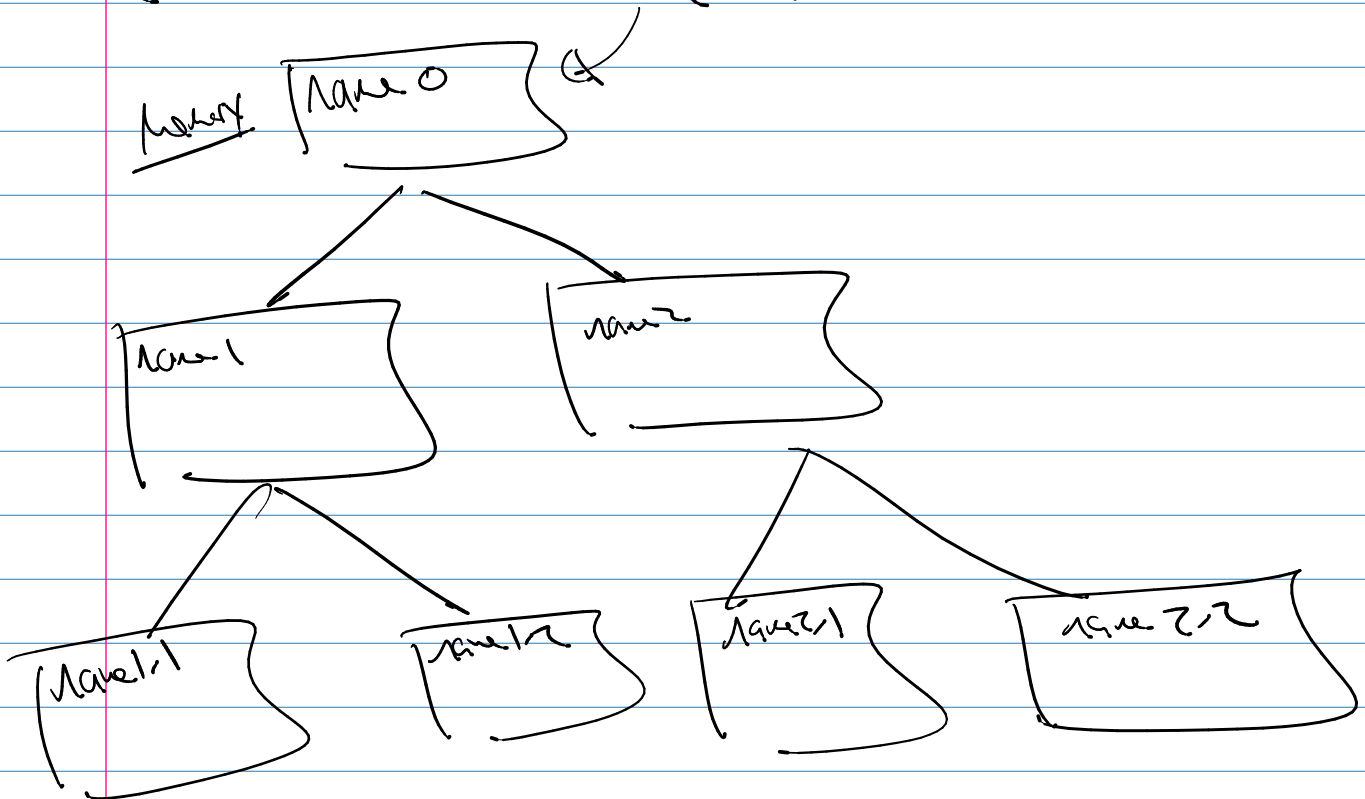
→ Self recursion

function  $output = name(input)$

$a_1 = name(i_1);$   
 $a_2 = name(i_2);$

etc

contain like  $name(x)$



ex

Fibonacci

0, 1, 1, 2, 3, 5, 8, ...

$$a_1 = 0 \quad a_2 = 1$$

$$a_n = a_{n-1} + a_{n-2}$$

loop

$$a = 0$$

$$b = 1$$

for  $i = 3 : n$

$$f = a + b;$$

$$a = b;$$

$$b = f;$$

do

$$f \leftarrow n^{\text{th}} \text{ fib}(n \geq 3)$$

base

base

$$f = \text{fib}(n-1) + \text{fib}(n-2)$$