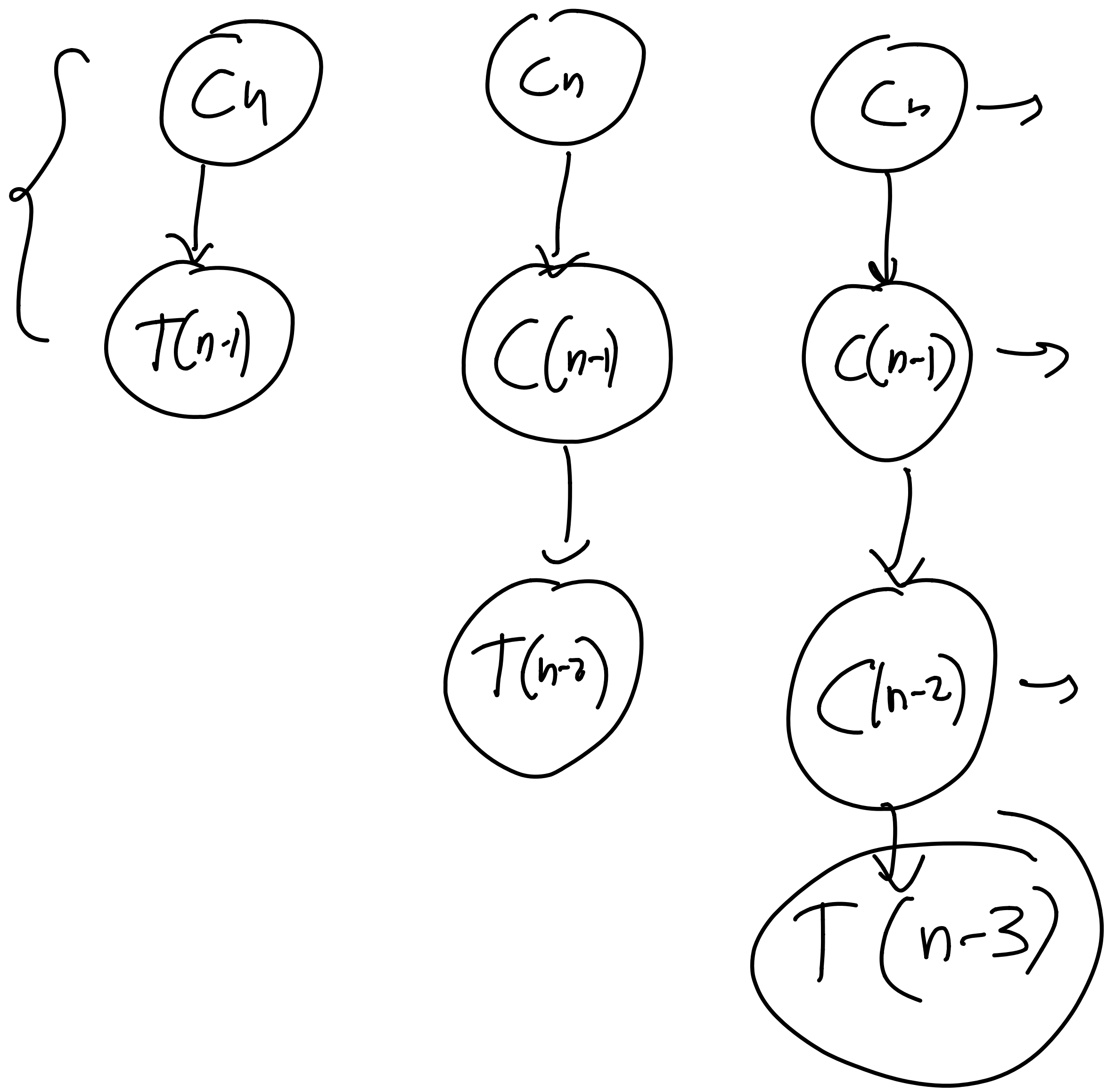
Recurrence

$$T(n) = T(n-1) + O(n)$$

$$O(n) = Cn$$

$T(n) =$



$$Cn + C(n-1) + C(n-2)$$

$$+ \ldots 1$$

$$= C(n + \underbrace{(n-1) + (n-2) \ldots\ldots 1}_{\text{Sum of first } n \text{ natural numbers}})$$

$$= C\frac{n(n+1)}{2} = C\frac{n^2+n}{2}$$

$$= \frac{Cn^2}{2} + \frac{C}{2}n$$

$$= \underline{\underline{O(n^2)}}$$

[1, 2, 3]

[1, 2].

pow-set (2) . powerset([1, 2])

I. pow-set ([1, 2]) $\subseteq$ pow-set ([1, 2, 3])

pow-set ([1, 2])

= [[ ], [1], [2], [1, 2]] — list)

U

New elements are

[[3], [1,3], [2,3], [1,2,3]] — list2

append list1 and list2

power-set([1,2,3])
= [[ ], [1], [2], [1,2],
[3], [1,3], [2,3], [1,2,3]]

power-set([1,2,3]) =

Union of power-set([1,2])

U Extra (Proof Pascals

Triangle) .

$$\text{Extra} = \bigvee_{X \in \text{powerset}([1,2])} \underline{X \cup \{3\}} \leftarrow \underline{\underline{\text{cons}}}$$

(append (power-set (rest input)

Extra elements)

map cons first of your list to every element in (power-set (rest input)) power-set$([a_1, a_2, a_3])$

$=$ power-set$([a_2, a_3])$

$\cup$ Extra elements.

power-~~ser~~-set $([a_2, a_3])$

$= [[\,], [a_2], [a_3], [a_2, a_3]]$

$a_1 \quad a_1 \quad a_1 \quad a_1$

$[[a_1], [a_1, a_2], [a_1, a_3], [a_1, a_2, a_3]]$

$O(n \log n)$

vector

0
1
2
3
4
5
6
7
8
9

999 87654

Vector

0	0	0	0	1	1	1	1	1	3
0	1	2	3	4	5	6	7	8	9

4 999 8765

Kecks

0	0	0	0	1	1	1	1	1	3
0	1	2	3	4	5	6	7	8	9