

$$\textcircled{1} \quad L_0 = 2, \quad L_1 = 1, \quad L_n = L_{n-1} + L_{n-2} \quad \forall n \geq 2$$

a) index	$L_n$	$f_n$
0	2	0
1	1	1
2	3	1
3	4	2
4	7	3
5	11	5
6	18	8
7	29	13
8	47	21
9	76	34
10	122	55
11	199	89
12	322	144
13	521	233
14	843	388
15	1364	610

۲۰۱۹-۱۰-۱۱ آغاز فرآندازی اولیه

תמיון ה-פודקס וטראנספורמציה מ-טראנספורמציה

לעומת זה, מילויו של תפקידו כשליט נסיך נושא לחשדתו של המלך.

$$L_n = f_{n-1} + f_{n+1} \quad \forall n \geq 1$$

$N$	Representation
1	$L_1$
2	$L_0$
3	$L_2$
4	$L_3$
5	$L_3 + L_1$
6	$L_3 + L_0$
7	$L_4$
8	$L_4 + L_1$
9	$L_4 + L_0$
10	$L_1 + L_2$
11	$L_5$
12	$L_5 + L_1$
13	$L_5 + L_0$
14	$L_5 + L_2$
15	$L_5 + L_3$
16	$L_5 + L_3 + L_1$
17	$L_5 + L_3 + L_0$
18	$L_6$
19	$L_6 + L_1$
20	$L_6 + L_0$

$N$  ស្ថិត នៅក្នុង  $\mathbb{N}$  ដូចជា  $1, 2, \dots$

$$N = 1 + L_1 \quad N = 2 + \underline{L_2}$$

$$N \in \mathbb{N}^+$$

ដូចជាដំឡើង  $N$  ដូច  $N < N'$  ដូចជាអ្នកបាន ស្រាវជ្រាវ

$L_h \leq N$  ដូចជាដំឡើង  $L_h$  ដូចជាដំឡើង  $L_{h+1}$

$$\text{ដូចជាដំឡើង } N = L_h \quad \forall h$$

$$0 < N - L_h < N \quad \text{ដូចជា } L_h < N \quad \forall h$$

ដូចជាដំឡើង  $N - L_h$  នឹង  $N$

$$N - L_h = \sum_{i=0}^1 \alpha_i L_i$$

$$N = (N - L_h) + L_h = \sum_{i=0}^1 \alpha_i L_i + L_h \quad , \quad \forall h$$

ដូចជាដំឡើង  $(d)$

$$N = 5 = L_2 + L_1$$

ដូចជាដំឡើង  $N = 5 = L_2 + L_1$

$$N = 5 = L_2 + L_0$$

Q

א.  $\lim_{x \rightarrow 0} \frac{\sin x}{x}$  ב.  $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$  ג.  $\lim_{x \rightarrow 0} \frac{x - \tan x}{\sin x}$

14)  $\Delta \subset h(S_1 S_2 L) \cup Y$

$$T(n) = 3T\left(\frac{n}{2}\right) + O(n)$$

۷۱۸  $\int_{0,1}^{\infty} (1-x)^{n-1} e^{-x} dx$  / ۷۱

$$a=3, b=2, h=1$$

$$a > b^n \Rightarrow T(n) = \Theta\left(n^{\log_b a}\right) = \Theta\left(n^{\log_2 3}\right)$$

(J)

$$X = 12, Y = 11$$

JK JK JK JK

$$X_B = 1100 \quad Y_B = 1011$$

1)  $a = 11, b = 00, c = 10, d = 11, n = 4$

①  $A_1 = \text{Mult}(11, 10) = 01^6 \cdot 0$

②  $A_2 = \text{Mult}(00, 11) = 0$

③  $A_3 = \text{Mult}(10, 11) = 11^{15}$

$$\text{Result} = 0110 \cdot 10000 + (1111 - 0110) \cdot 100 + 0 = 96 + 36 = 132$$

2) ①  $X = 11, Y = 10, a = 1, b = 1, c = 1, d = 0, n = 2$

$$A_1 = \text{Mult}(1, 1) \Leftrightarrow 1 \cdot 1 = 1$$

$$A_2 = \text{Mult}(1, 0) \Leftrightarrow 1 \cdot 0 = 0$$

④  $A_3 = \text{Mult}(10, 01) \Leftrightarrow 10$

$$\text{Result} = 1 \cdot 2^2 + (2 - 1) \cdot 2 + 0 = 4 + 2 = 6 + 110$$

④.1  $X = 10, Y = 01, a = 1, b = 0, c = 0, d = 1$

$$A_1 = \text{Mult}(1, 0) \Leftrightarrow 0$$

$$A_2 = \text{Mult}(0, 1) \Leftrightarrow 0$$

$$A_3 = \text{Mult}(1, 1) \Leftrightarrow 1$$

$$\text{Result} = A_3 \cdot 2 = 1 \cdot 2 = 10$$

$$\textcircled{1} \quad X = 00, Y = 11, a=0, b=0, c=1, d=1, n=2$$

$$A_1 = \text{mult}(0, 1) \leftarrow 0$$

$$A_2 = \text{mult}(0, 1) \leftarrow 0$$

$$\textcircled{2.1} \quad A_3 = \text{mult}(0, 10) \leftarrow 0$$

$$Y_{\text{left}} = 0$$

$$\textcircled{2.2} \quad X = 00, Y = 10, a=0, b=0, c=1, d=0, n=2$$

$$A_1 = \text{mult}(0, 1) \leftarrow 0$$

$$A_2 = \text{mult}(0, 0) \leftarrow 0$$

$$A_3 = \text{mult}(0, 1) \leftarrow 0$$

$$Y_{\text{left}} = 0$$

$$\textcircled{3} \quad X = 0011, Y = 0101, a=00, b=11, c=01, d=01, n=4$$

$$A_1 = \text{mult}(0, 1) \leftarrow 0$$

$$\textcircled{3.1} \quad A_2 = \text{mult}(11, 01) \leftarrow \textcircled{1}$$

$$A_3 = \text{mult}(11, 10) \leftarrow \textcircled{2}$$

$$Y_{\text{left}} = 01(0100 - 0011)2^3 + 0100 - \textcircled{1}$$

$$\textcircled{3.2} \quad X = 11, Y = 01, a=1, b=1, c=0, d=1, n=2$$

$$A_1 = \text{mult}(1, 0) \leftarrow 0$$

$$A_2 = \text{mult}(1, 1) \leftarrow ?$$

$$A_3 = \text{mult}(1000) \leftarrow \textcircled{3}$$

$$Y_{\text{left}} = (1-1)2^3 + 1 = \textcircled{2}$$

(3)

$O(1)$   $a = b = 1$   $\rightarrow$   $a, b$  never  $\geq \sqrt{N}$   $\rightarrow$   $O(1)$

$$: \forall i, j \quad a+b \leq N \quad \Rightarrow \quad O(1)$$

$$O(1) \left\{ \begin{array}{l} \text{temp} = b \\ b = a+b \\ a = \text{temp} \end{array} \right.$$

$$\frac{\log(N)}{n}$$

$N$   $\rightarrow$   $a, b$   $\leq \sqrt{N}$   $\rightarrow$   $a+b \leq N$   $\rightarrow$   $a+b \geq N$ ,  $\rightarrow$   $O(n^2)$

$$n \cdot O(n) = O(n^2)$$

$\rightarrow$   $n^2$   $\rightarrow$   $n^2$

$\rightarrow$   $n^2$   $\rightarrow$   $n^2$   $\rightarrow$   $n^2$   $\rightarrow$   $O(n^2)$

$$: \forall i, j \quad \frac{O(n)}{N > 0} \quad \Rightarrow \quad O(1)$$

$O(n^2)$   $\rightarrow$   $(a + b)^2 \geq ab$   $\rightarrow$   $a^2 + b^2 \geq ab$   $\rightarrow$   $a^2 + b^2 \geq ab$

$$O(1) \quad \rightarrow \quad n^2 \geq ab$$

$$O(n) \quad \rightarrow \quad n \cdot n \geq ab$$

$$\frac{\log(n)}{n}$$

$O(1) \rightarrow n^2 \rightarrow n^2$

$$n \cdot (O(n^2) + O(n)) = O(n^3)$$

(C)