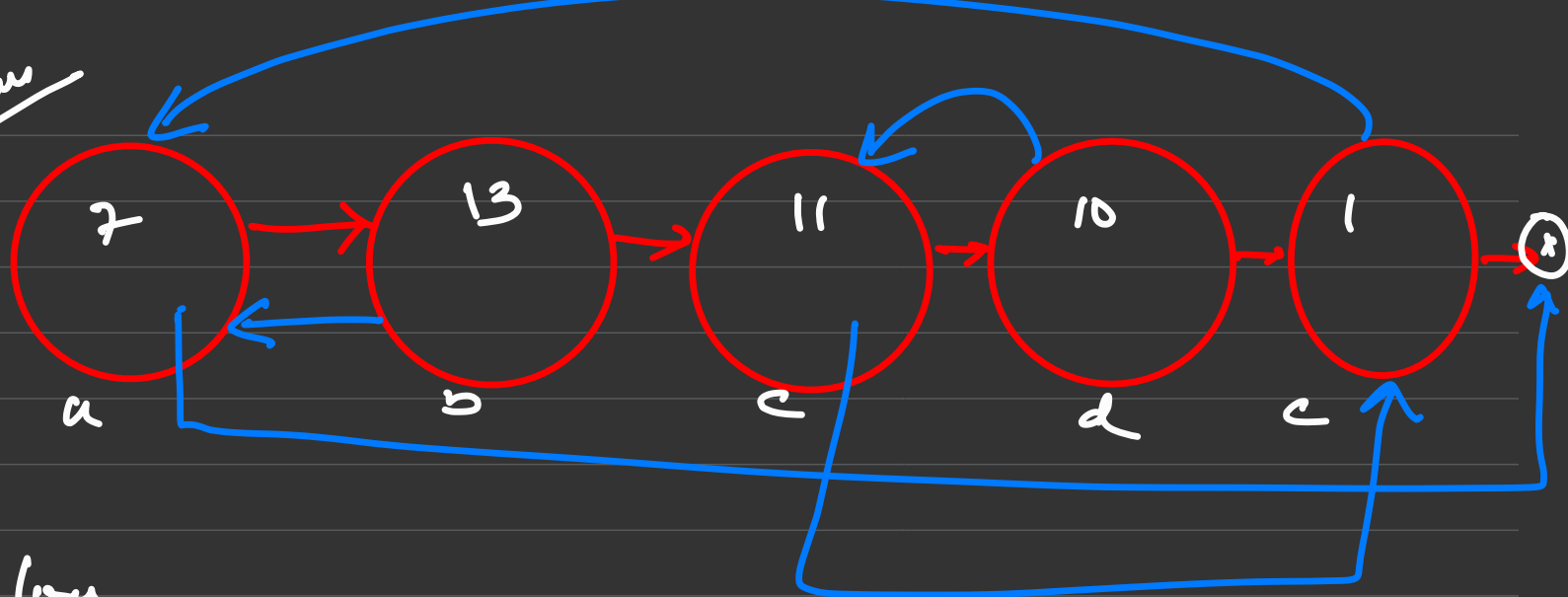
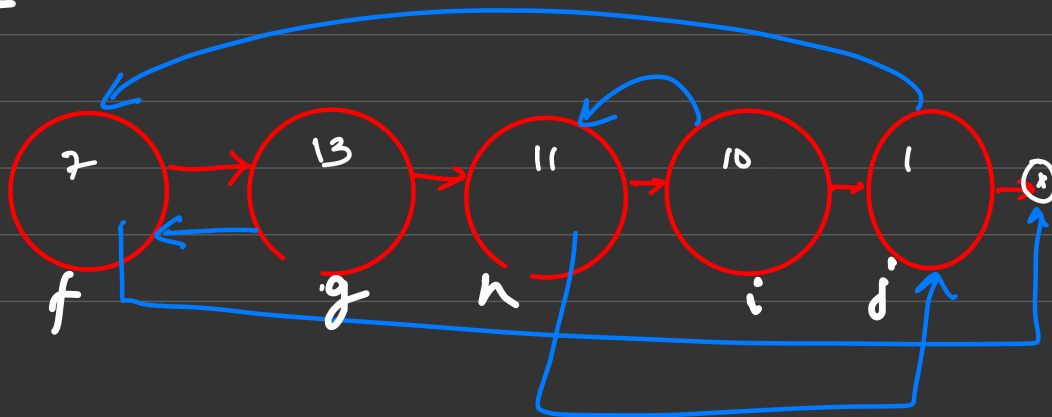


given

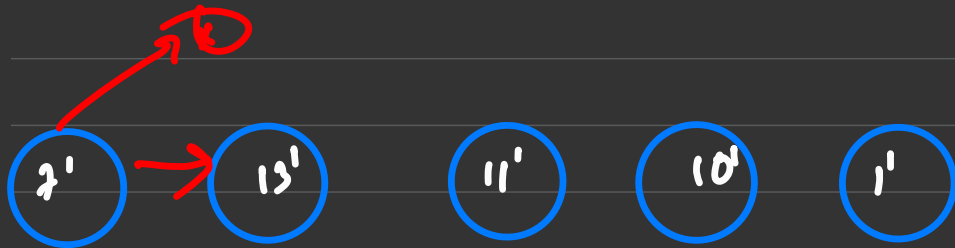
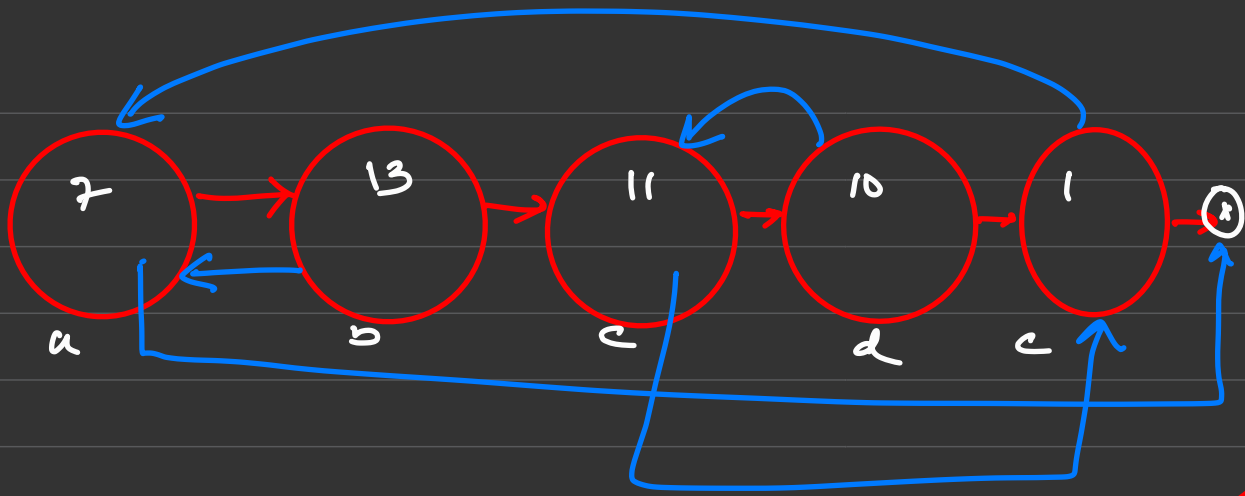


clone



$O(n^2)$

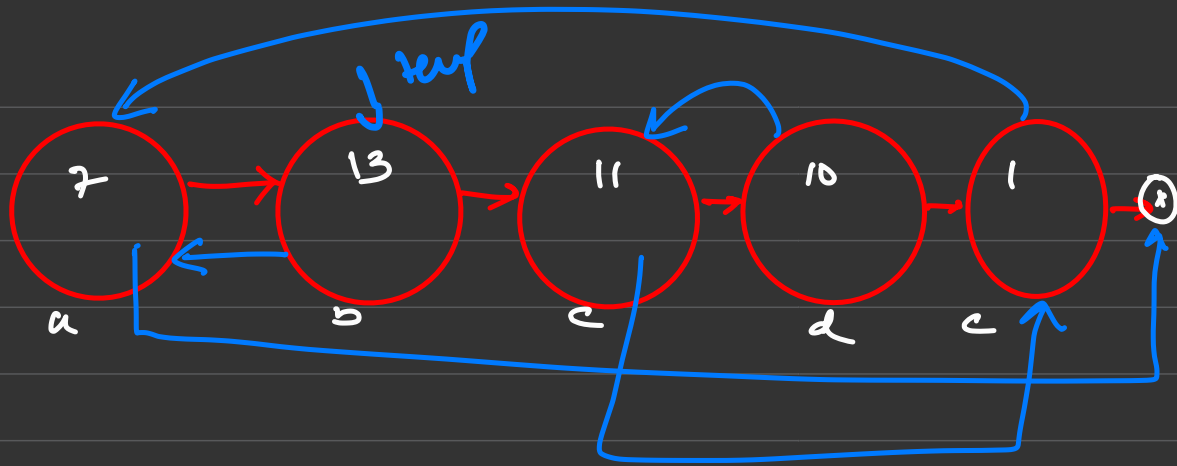
$\approx O(n)$



$$mp[old].next = mp[old.next]$$

$$mp[old].random = mp[old.random]$$

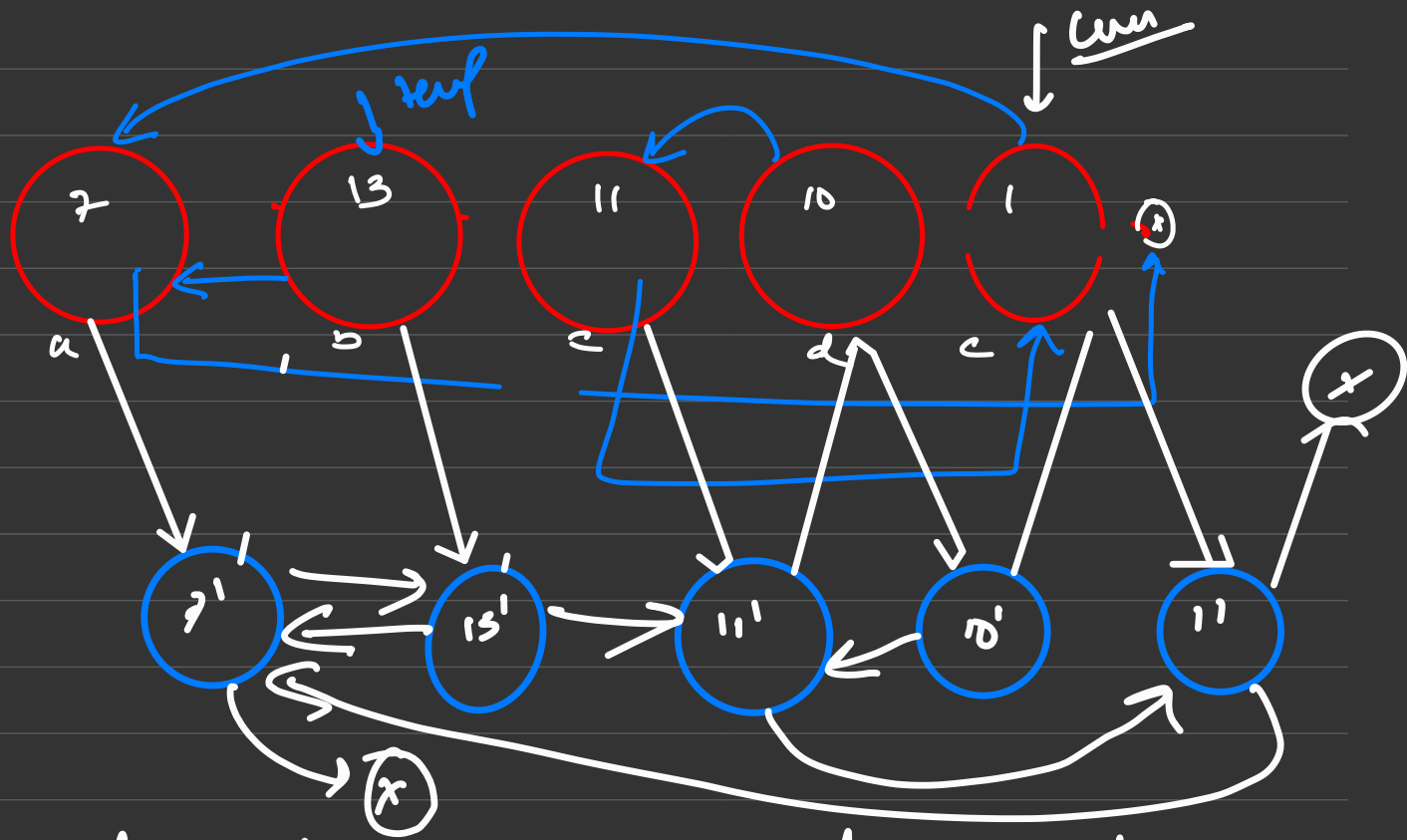
old	new
7	<div> <div>7'</div> <div>a → c</div> <div>c → d</div> </div>
13	13'
11	11'
⋮	⋮



MAP

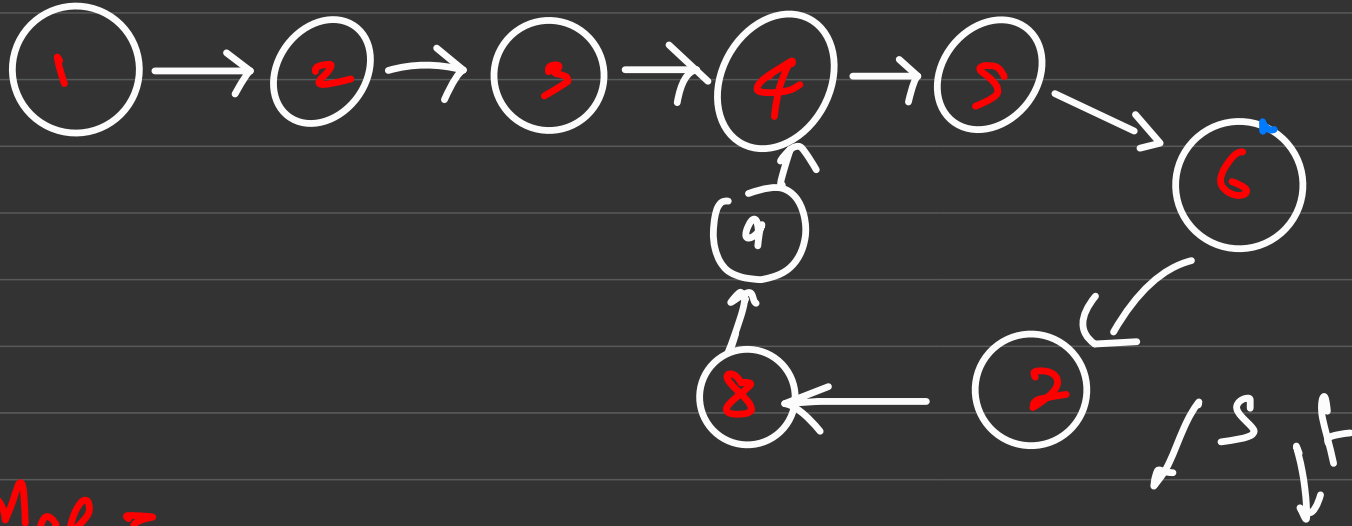
old value	new Node
7	7
13	13
11	11
⋮	⋮

$mp[temp.data].next = mp[temp.next.data]$
 $mp[temp.data].value = mp[temp.next.data]$



$curr.next.random = curr.random.next$
 $curr.next.next = curr.next.next.next$

Space $\rightarrow O(1)$



Mof =

$O(n)$

Rabbit & Hare Tricle



Qn

7,2 0,0

R	R	D	R	D	R
		R	U	D	L
		L	U	D	
			U	L	

grid of char

grid[i][j] $\begin{cases} \nearrow L \\ \rightarrow R \\ \searrow D \\ \downarrow U \end{cases}$

N x N

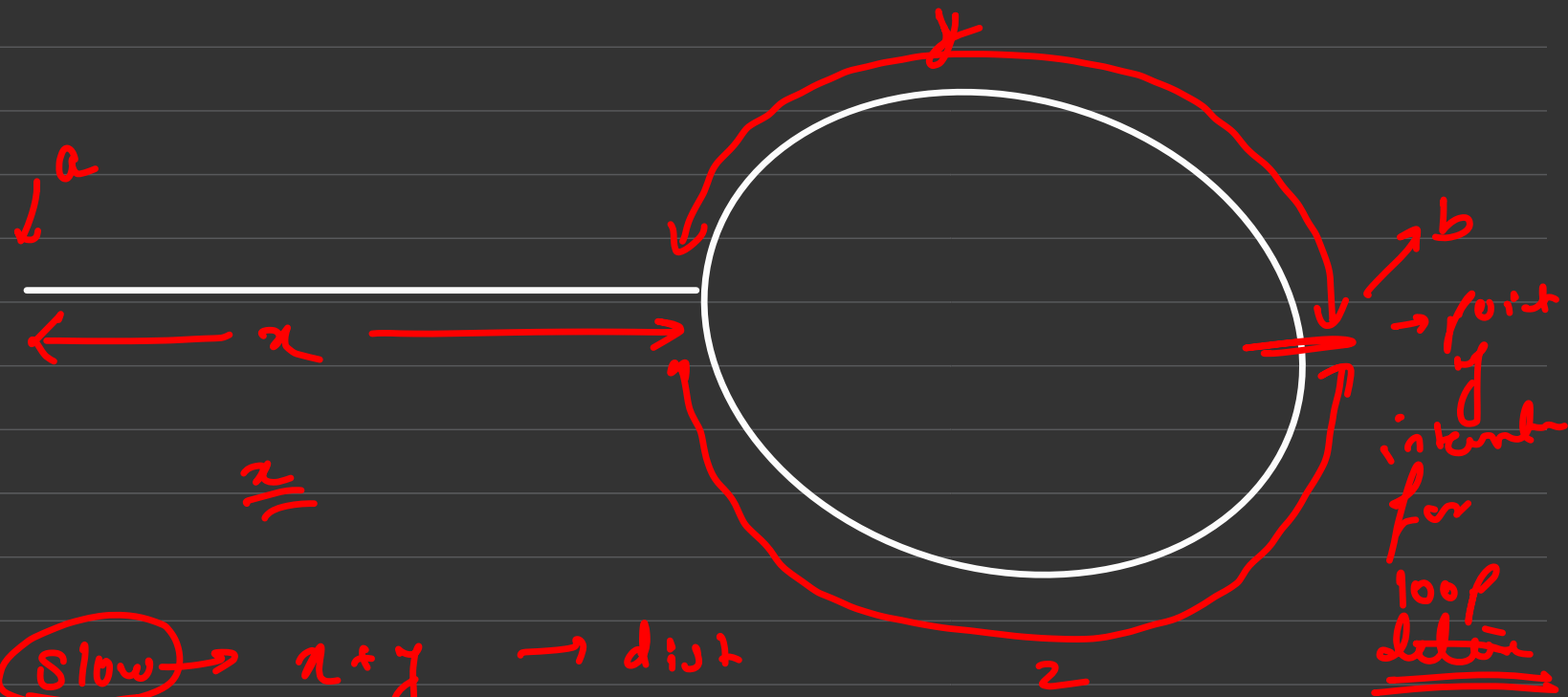
$N \leq 10^4$

Detect can we reach the bottom right cell or not?.

Space $\rightarrow O(1)$

In the worst case there can be n^2 steps

comb = 0



Slow $\rightarrow x + y \rightarrow \text{dist}$
 Fast $\rightarrow x + y + 2xy \rightarrow \text{dist}$

$$x + y + 2xy = 2(x + y) \Rightarrow \boxed{z = x}$$