

sum = 0

n = N

while n > 0

for i in range(n):

sum = sum + 1

n = n // 2

T	n
1	N
2	N/2
3	N/4
4	N/8
...	...
j	0

$$T(n) = N + \frac{N}{2} + \frac{N}{4} + \dots + 0$$

$$= N \left(1 + \frac{1}{2} + \frac{1}{4} + \dots + 0 \right)$$

$$1 + \underbrace{\sum_{i=1}^{\infty} \left(\frac{1}{2} \right)^i}_{1}$$

$$T(n) < 2N$$

$$\Rightarrow T(n) = O(n)$$

$A \rightarrow B \rightarrow C \rightarrow D \rightarrow \text{null}$

$X = A \rightarrow B \rightarrow C \rightarrow D \rightarrow \text{null}$

$x_0 = A \rightarrow B$

$F(x_0) = B \rightarrow A$

$x_1 = C \rightarrow D$

$F(x_1) = D \rightarrow C$

$x_2 = null$

$f(x_2) = null$

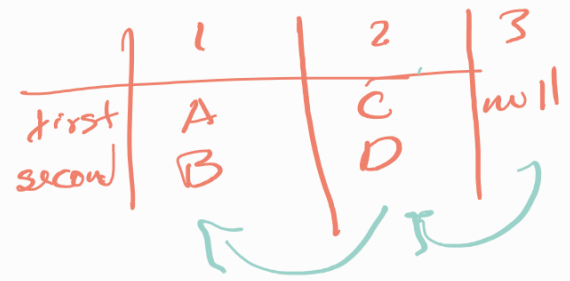
$f(x_0) \rightarrow f(x_1) \rightarrow f(x_2)$

$B \rightarrow A \rightarrow D \rightarrow C \rightarrow null$

swap(head):
if head == null or head.next == null:

return head

first = head
second = head.next



first.next = swap(second.next)

second.next = first

return second

$A \rightarrow B$

$f(x_0) = B \rightarrow A \rightarrow f(x_1)$

$D \rightarrow C \rightarrow f(x_2)$
 $\rightarrow null$

$B \rightarrow A \rightarrow D \rightarrow C \rightarrow null$

for loop:

$A \rightarrow B \rightarrow C \rightarrow D \rightarrow null$

counter 1 2 3 4 5

temp : B.next

$B \rightarrow A \rightarrow C \rightarrow D \rightarrow null$

B.next = A

A.next = temp -

D

B → A

D → C

