Palindrome

$\rightarrow$

$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6$

$O(n)$ } $O(n)$
$O(n)$ } =
$O(n)$

✓

✓

$1 \rightarrow 2 \rightarrow 3$

$4 \rightarrow 5 \rightarrow 6$ ✓

$6 \rightarrow 5 \rightarrow 4$

Space $O(n)$

Space : $O(1)$

Rearrange List

$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6$ $\rightarrow$ L1 $\rightarrow 1 \rightarrow 2 \rightarrow 3$

L2: $4 \rightarrow 5 \rightarrow 6$

↳ $1 \rightarrow 6 \rightarrow 2 \rightarrow 5 \rightarrow 3 \rightarrow 4$

↳ $6 \rightarrow 5 \rightarrow 4$

(#) $\rightarrow 1 \rightarrow 6 \rightarrow 2 \rightarrow 5 \rightarrow 3 \rightarrow 4$

LL Cycle

$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \searrow$

f f $f \rightarrow$
$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5$

9' 6
8 ← 7 ←
sf

$s \quad s \quad \underline{s}$
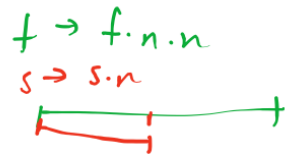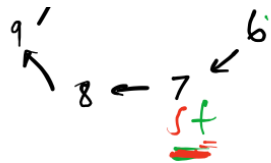
Claim → f & s
will meet
↳ f will never be
able to get out

$t → f.n.n$
$s → s.n$

$(n-1)\underline{c}$

$x = (n-1)c + (c-y)$ ✓
$\overline{\overline{\textcircled{1}}}$
constant

12

Total distance
covered by f
$= x + \underline{n} \times c + y$ ✓

$\underline{\underline{x}}$
1 → 2 → 3 → ④ → 5
0   1   2   3↗ c   6 ↘ y
                 4
(c-y)   9
        8 ← 7 ←
              sf
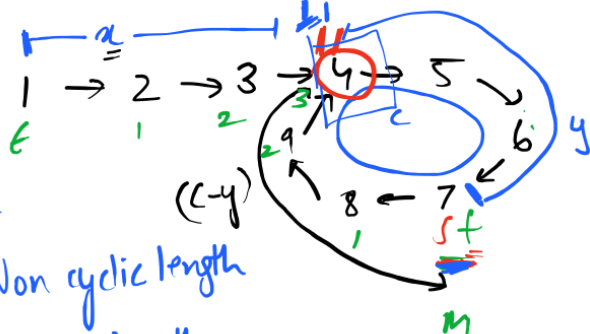
$x →$ Non cyclic length

$c →$ cyclic length

$y →$ length at which
both meet

m

$(n-1)\,c = k$

Total distance
covered by s
$= x + y$ ✓

$s = \dfrac{D}{t}$ ✓

$$S_f = 2 \cdot S_s$$

$$x + nC + y = 2(n + y)$$

$$\frac{x + nC + y}{\cancel{t}} = 2\frac{(n + y)}{\cancel{t}}$$

$$nC = x + y \qquad \rightarrow (n-1)C + (C - y)$$

$$x = \boxed{nC} - y$$

$$\underline{x} = \underbrace{(n-1)C}_{\text{Constant}} + (C - y)$$

Intersection of LL

L1 → 7

1 → 2 → 3 → 4
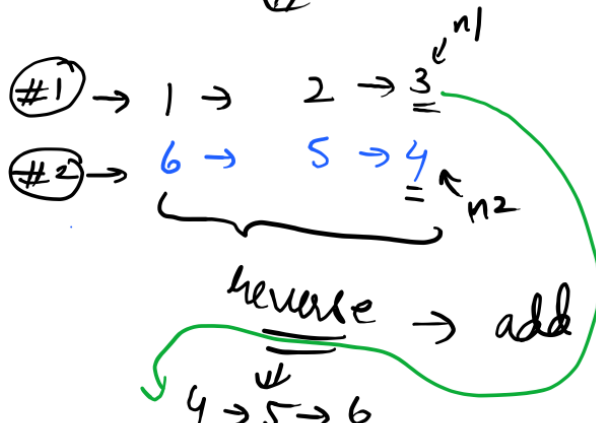
8 → 9

5 → 6 → 7

L2 → 5

5 ✓

$O(n^2)$ ✗
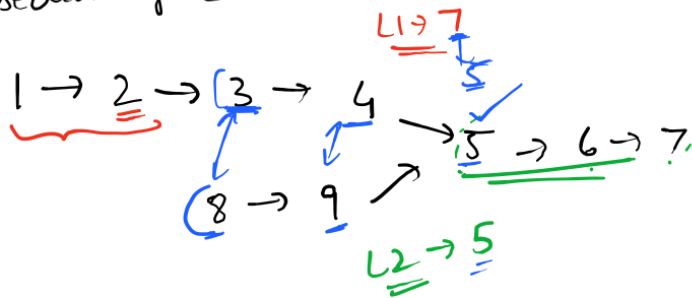
8 → 9 → 5 → 6 → 7

Remove duplicates from a sorted list

$1 \rightarrow 1 \rightarrow 2 \rightarrow 2 \rightarrow 3 \rightarrow 3 \rightarrow 3 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow$

$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5$

$1 \rightarrow 2 \rightarrow 1 \rightarrow 3 \rightarrow 2$

$(\#) \rightarrow 1 \rightarrow 2 \rightarrow 3$

Unfold LL

$L \quad 1 \rightarrow 6 \rightarrow 2 \rightarrow 5 \rightarrow 3 \rightarrow 4$

$\Downarrow$

$(\#1) \rightarrow 1 \rightarrow 2 \rightarrow 3$ n1

$(\#2) \rightarrow 6 \rightarrow 5 \rightarrow 4$ n2

reverse $\rightarrow$ add

n1. next = reversed

$4 \rightarrow 5 \rightarrow 6$
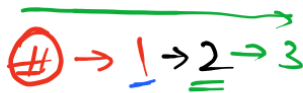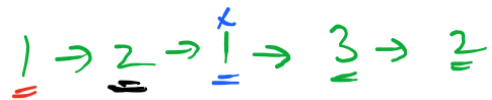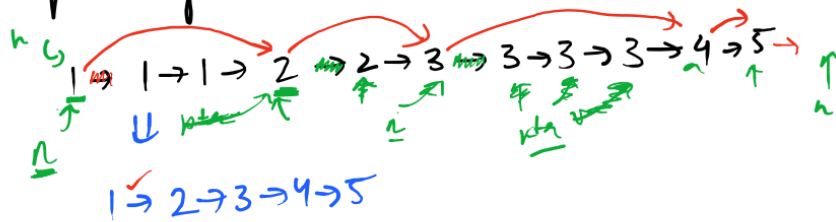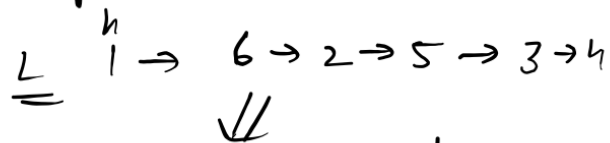
↑
reversed

Segregating 0s, 1s & 2s

0111201011

$0 \rightarrow 1 \rightarrow 1 \rightarrow 1 \rightarrow \boxed{2} \rightarrow 0 \rightarrow 1 \rightarrow 0 \rightarrow 1 \rightarrow 1$

(#0) → n0 n0 n0
        0 → 0 → 0

(#1) → n1
        1 → 1 → 1 → 1 → 1 → 1
                            n1

(#2) → $\boxed{2} \rightarrow$ null
        n2
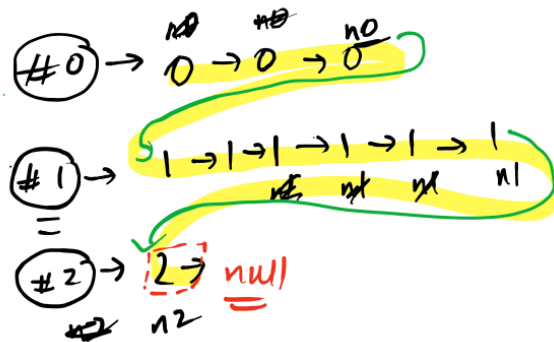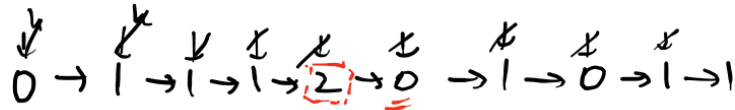
$n0.next = dh1.n$

$n1.next = dh2.n$

$n2.next = null;$

return $dh0.n$

Partitioning a LL

162534
3

$1 \rightarrow 6 \rightarrow 2 \rightarrow 5 \rightarrow 3 \rightarrow 4 \rightarrow 0$

2 LL

n1
(1 → 2)   n2
           (6 → 5 → 3 → 4)

↑   ↑
dh1   dh2
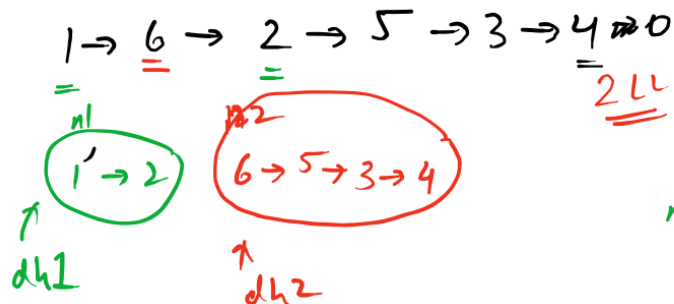
$n1.next \rightarrow dh2.next$

$n2.next = null;$

$1-11$

$①, 2, \cancel{3}, 4, \cancel{5}, 6, \cancel{7}, 8, \cancel{9}, 10, \cancel{11}$

Ⓘ

$\Downarrow$

$2, 4, 6, 8, 10 \Rightarrow 2(①2, ③4⑤) \rightsquigarrow SP$

$\underline{4-5}$

$\underline{\underline{=}}$

$\mathbf{4, \underline{\underline{8}}}$

SW

$2(2, 4)$

$\Downarrow$

$2 \times 2 \times (①2)$

Ⓗ $\Rightarrow$

$\Downarrow$

I

$2 \times 2 \times (2)$

$\underline{\underline{\underline{}}}$

$\Rightarrow \underline{\underline{8}}$

ζ

$2 \times \sqcup$

$\hookrightarrow$ removing odd or even

$\Downarrow$