

Reverse a LL:-

32 49 58 67 91
10 → 20 → 30 → 40 → 50 ⇒ 50 → 40 → 30 → 20 → 10

• Data Reversal =

0 1 2 3 4
50 → 40 → 30 → 20 → 10
Size = 5
10 → 20 → 30 → 40

getAt (idn) {
if (idn < 0 || idn ≥ size)
return null;

i = 0
node = head
while (i < idn) {
i++;
node = node.next;
}
return node;

T.C ⇒ O(n)

dataReverse() {

i = 0
while (i < size/2) {

l = getAt(i);

r = getAt(size - 1 - i);

swap(l, r);

}

T.C ⇒ O(n) × (O(n) + O(n))
= 2n² = O(n²)

Pointer Reversal

17 61 89 37 90
10 → 20 → 30 → 40 → 50 → null ⇒ null 17 61 89 37 90
← 10 ← 20 ← 30 ← 40 ← 50
H

h
← 35 ← 27 ← 16 ← 10 ← 23 →

P = null

C = 35

N = 27

C.next = P

T.C ⇒ O(n)

Pointer Rev() {

P = null

C = head

while (C != null) {

N = C.next;

C.next = P

P = C

C = N

}

$\begin{matrix} P \\ \downarrow \\ \text{null} \end{matrix} \rightarrow 10 \rightarrow 20 \rightarrow 30 \rightarrow 40 \rightarrow 50 \rightarrow \text{null}$

$P = \text{null}$
 $C = 10 \rightarrow 20 \rightarrow 30 \rightarrow 40 \rightarrow 50 \rightarrow \text{null}$
 $N = 20 \rightarrow 30 \rightarrow 40 \rightarrow 50 \rightarrow \text{null}$

$C = \text{IV}$
 $\text{head} = P;$

```

public void pointerRev() {
    Node p = null;
    Node c = this.head;
    while (c != null) {
        Node n = c.next;
        c.next = p;
        p = c;
        c = n;
    }
    this.head = p;
}

```

Find the mid in LL:-

Size.

$10 \rightarrow 20 \rightarrow 30 \rightarrow 40 \rightarrow 50 \rightarrow \text{null}$
 S

$S+1$
 $J+2$

$S = J = \text{head};$
 while ($J \neq \text{null} \ \&\& \ J.\text{next} \neq \text{null}$) {
 $S = S.\text{next};$
 $J = J.\text{next}.\text{next};$
 }
 return S;

Palindrom LL:-

<https://leetcode.com/problems/palindrome-linked-list/>

$1 \rightarrow 2 \rightarrow 2 \rightarrow 2 \rightarrow 1 \rightarrow \text{null}$
 ~~$T.C \rightarrow O(n^2)$~~ $O(n)$

1 2 3 4 3 2 1

$1 \rightarrow 2 \rightarrow 2 \rightarrow \boxed{2 \rightarrow 1} \rightarrow \text{null}$
 $1 \rightarrow 2 \rightarrow 2 \rightarrow \text{null}$
 $1 \rightarrow 2 \rightarrow \text{null}$

$0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7$
 $10 \rightarrow 20 \rightarrow 30 \rightarrow 40 \rightarrow 40 \leftarrow 30 \leftarrow 20 \leftarrow 10 \leftarrow$
 $\quad \quad \quad 4 \quad \quad \quad \text{null} \quad \quad \quad 4$

Intersection LL:-

$A \quad 10 \rightarrow 20 \rightarrow 30 \rightarrow$
 $\quad \quad \quad \downarrow \quad \quad \quad A_i$
 $\quad \quad \quad 40 \rightarrow 60 \rightarrow 70$
 $B \quad 90 \rightarrow 80 \rightarrow 100 \rightarrow 110 \rightarrow$
 $\quad \quad \quad \downarrow \quad \quad \quad B_i$

$A.\text{Size} = 6$
 $B.\text{Size} = 7$

$$\underline{B.\text{size} - A.\text{size} = 1}$$

$$\begin{array}{l}
 3 - 4 = -1 \\
 4 - 3 = 1
 \end{array}
 \begin{array}{l}
 \nearrow \\
 \searrow
 \end{array}
 \text{Math.abs}(\quad) = 1$$