

int $i = 5$

L 0000 0101

Note - 1 byte = 8 bit

$$8 \text{ bit} = 2^8 = 256$$

if suppose int is 32 bit type

$$\text{So } 8 \times 4 = 32 \text{ bit}$$

i.e. = 4 byte { If 64 bit type
+ occupies 8 cells }

1 byte = 1 memory location.

So a integer will take 4 memory cell

Suppose take a list of int type

List1 = [1, 2]

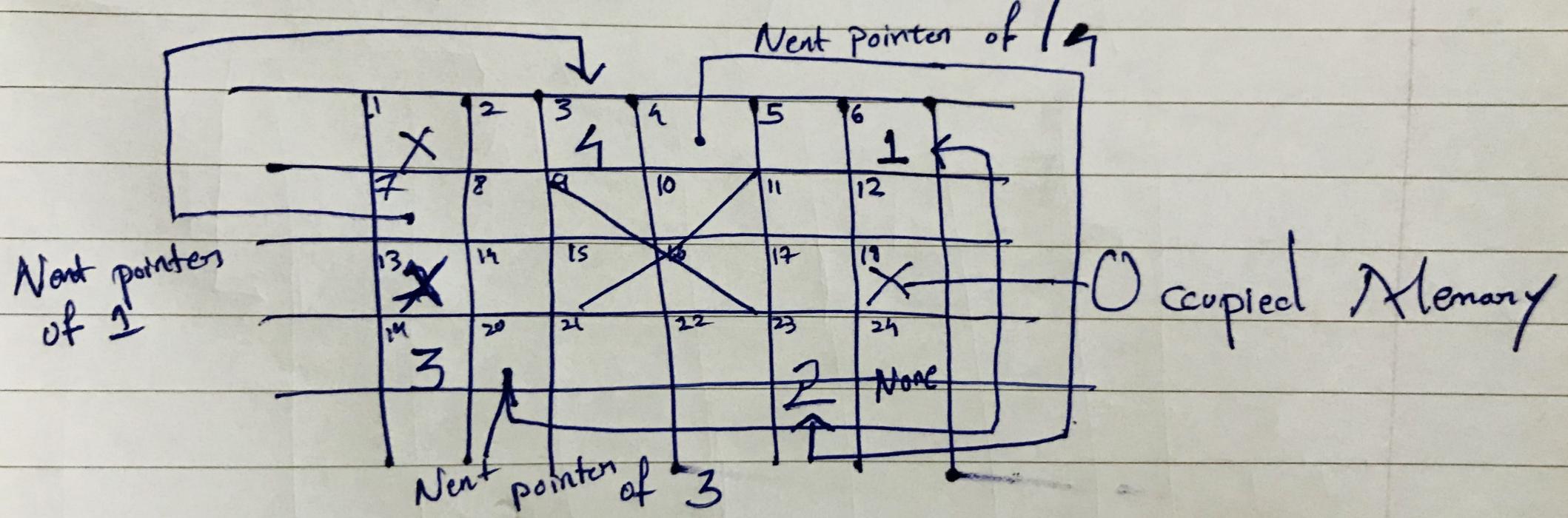
0000 0001 0000 0010

List2 = [1, 2, 3] — No space.

We cannot store in now 4 and 5 as now
5 column 3 is occupied

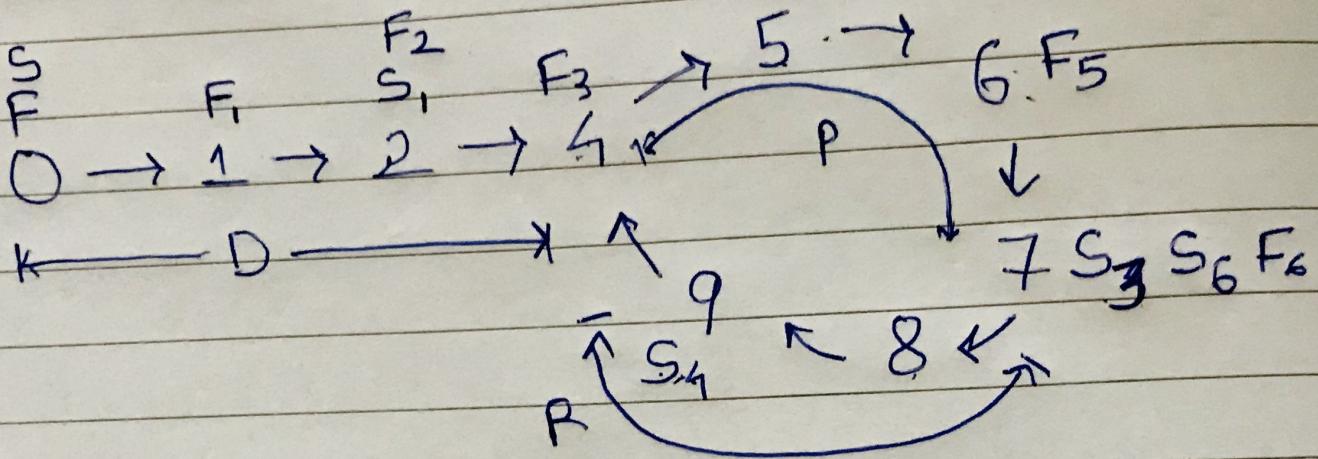
For character it assign ASCII values :-
(A) = 65

Linked List



Our Linked List - $3 \rightarrow 1 \rightarrow 4 \rightarrow 2$

Find Loop :-



Take two pointers : F and S

F will move 1 node at a time (Forward)

S will move 2 node at a time (Forward)

Traverse till they meet at same point.

Now, ~~Do~~ Let distance travelled by F = x

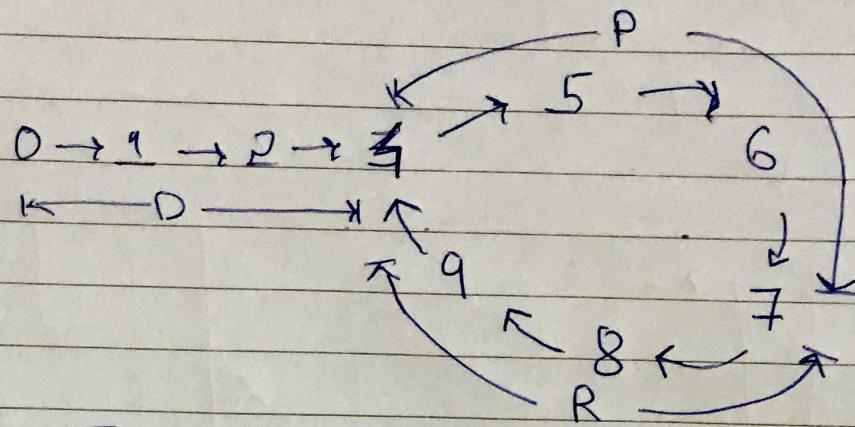
than S will be, S = 2x

$$F = x = D + P$$

$$S = 2x = 2D + 2P$$

$$R = ?$$

Now,



Let, Total distance of ~~loop~~ be T

$$S = 2D + 2P$$

If we subtract P from S we get the total distance of Linked List.

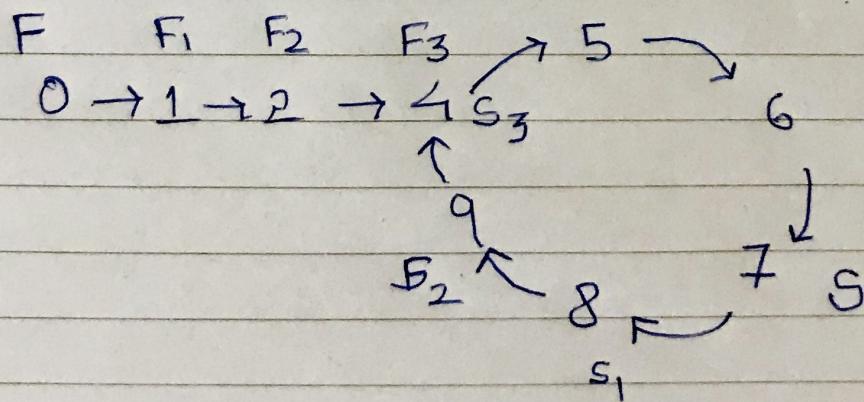
$$T = 2D + 2P - P \Rightarrow 2D + P$$

$$\text{So, } R = T - D - P$$

$$= (2D + P) - D - P$$

$$\boxed{R = D}$$

So now, we initialize F to initial position
Move forward F and S by 1 step.



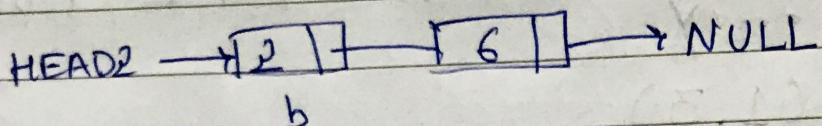
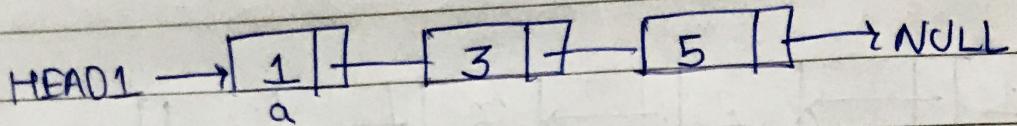
Stop when they met at same position.

So, when $S == F$ there is the beginning of Loop.
Time complexity - $O(N)$.

$$(S=N, F=N \ (N+N=N))$$

Merge two sorted linked list

HEAP
dummy node

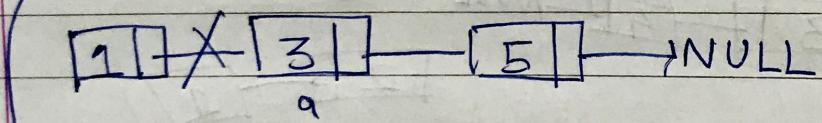
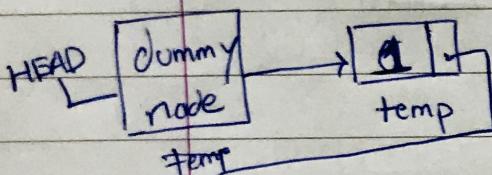


if $a \neq b$

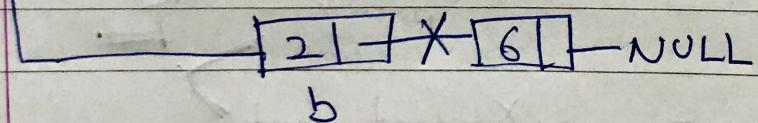
~~temp = HEAD1~~

else

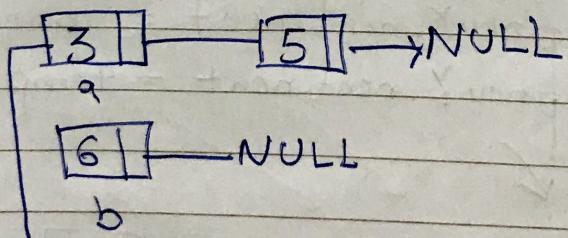
temp = HEAD2



$b < a$

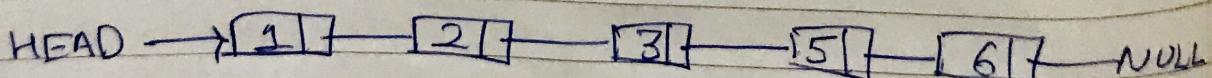
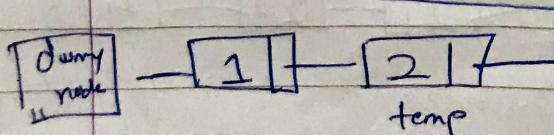


temp = head 2



$a < b$

temp = head1



head = dummy node.next

// reverse a linked list:

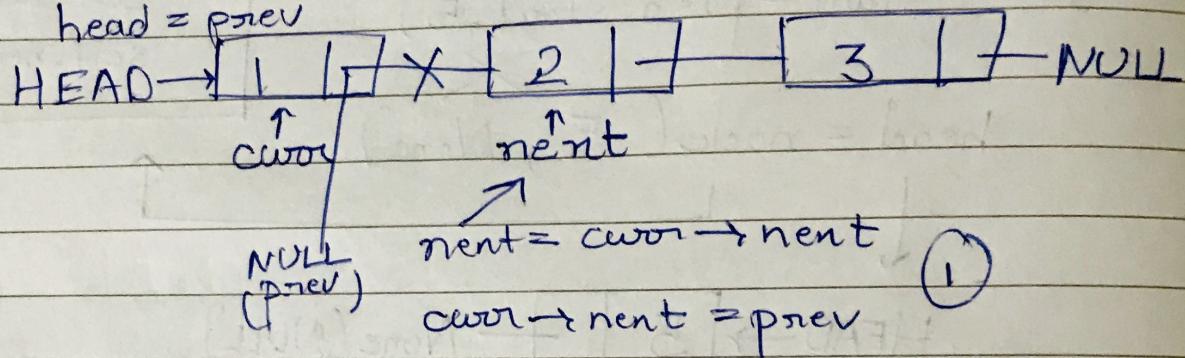
$p_{prev} = \text{NULL}$, $curr = \text{head}$, $next = \text{NULL}$

① $next = curr \rightarrow next$
② $curr \rightarrow next = p_{prev}$

} — Loop till curr is null.

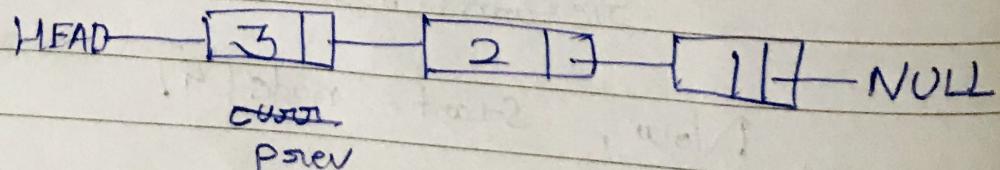
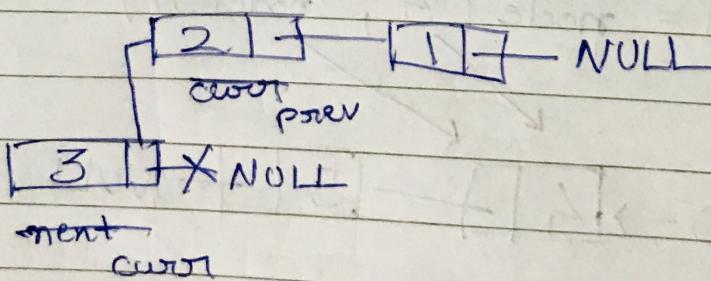
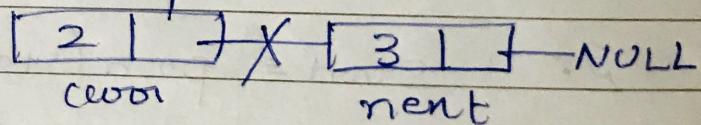
③ $p_{prev} = curr$
 $curr = next$

4) $head = p_{prev}$



①

$p_{prev} = curr$
 $curr = next$ ②



3) $head = p_{prev}$