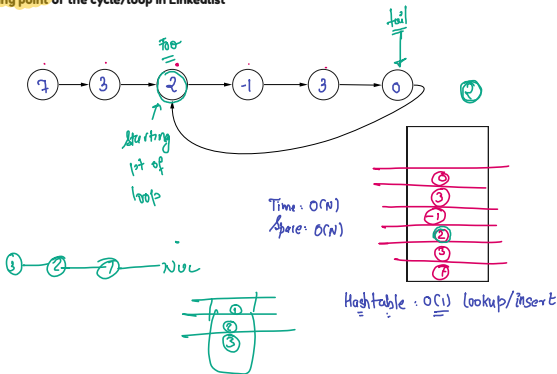
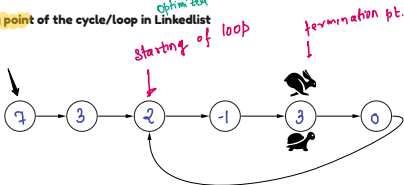


### Find starting point of the cycle/loop in Linkedlist




### Find starting point of the cycle/loop in Linkedlist *Optimized*

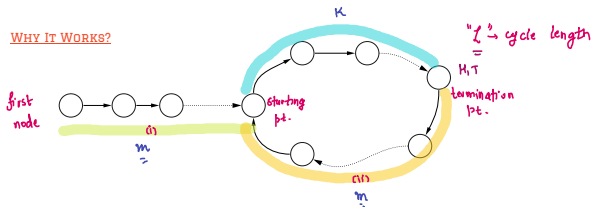


Time:  $O(N)$   
Space:  $O(1)$

## STEPS

1. find the termination point.
2. Make a "tmp" point to first node.
3. Start moving  & "tmp" until they meet. (by 1 step)

### WHY IT WORKS?



$$\left. \begin{aligned} d_h &= m + k + \frac{h}{L} \times L \\ d_t &= m + k + \frac{t}{L} \times L \end{aligned} \right\} \underline{\underline{d_h = 2 \times d_t}}$$

$$\therefore 2m + 2k + 2h = 2m + 2k + 2h \Rightarrow m + k = \frac{2(h-2k)}{2}$$

integer multiple of "2"