Tidy number

TIDY NUMBER

Aim: Given a number, give a number as solution, where number is in increasing order of digits & is greatest.

For eg-

45000 ⟶ 44999

44000 ⟶ 33999

number $n \leq 10^{10}$ -

Pseudocode Solution :-

(a) Start at Most significant digit towards least Significant digit.

(b) Check if next digit ≥ current digit.

(i) if yes, continue upgrading to next digit

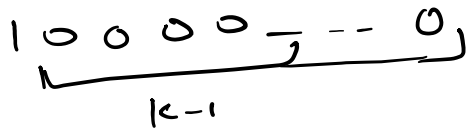
(ii) if No → (I) Iterate towards MSD until, previous digit > current digit & reduce digit by 1.

(II) Move towards LSD & replace it with 9 & return

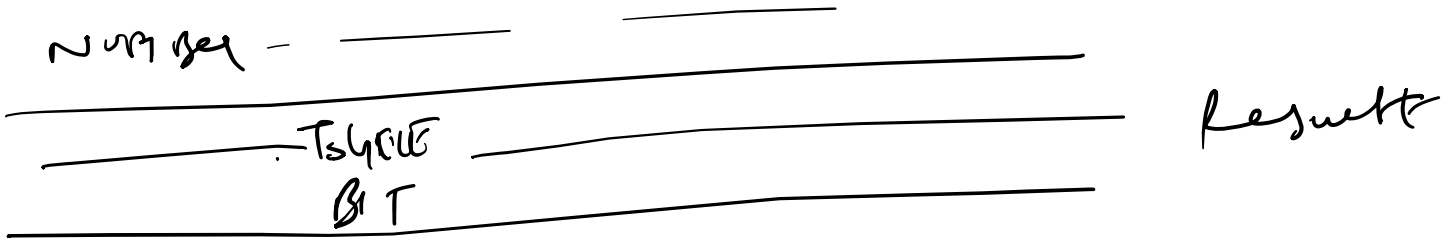
Complexity — Space O(K) O(1) — Time O(K) K is power of 10 digits

(2) Toggle k^{th} bit of a binary number.

Solution: Left shift 1 << k-1 times



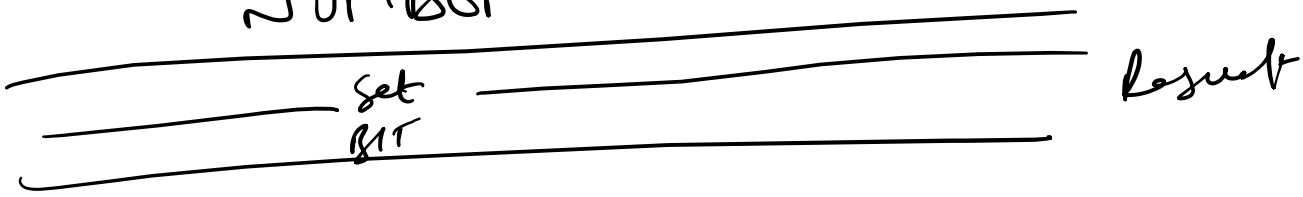
XOR



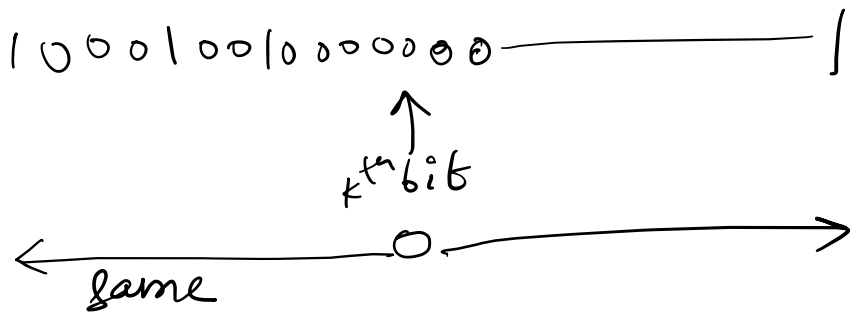
(3) Set k^{th} bit.

Solution: Left shift 1 << k-1 times

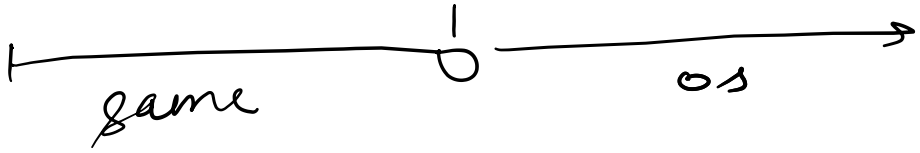
OR



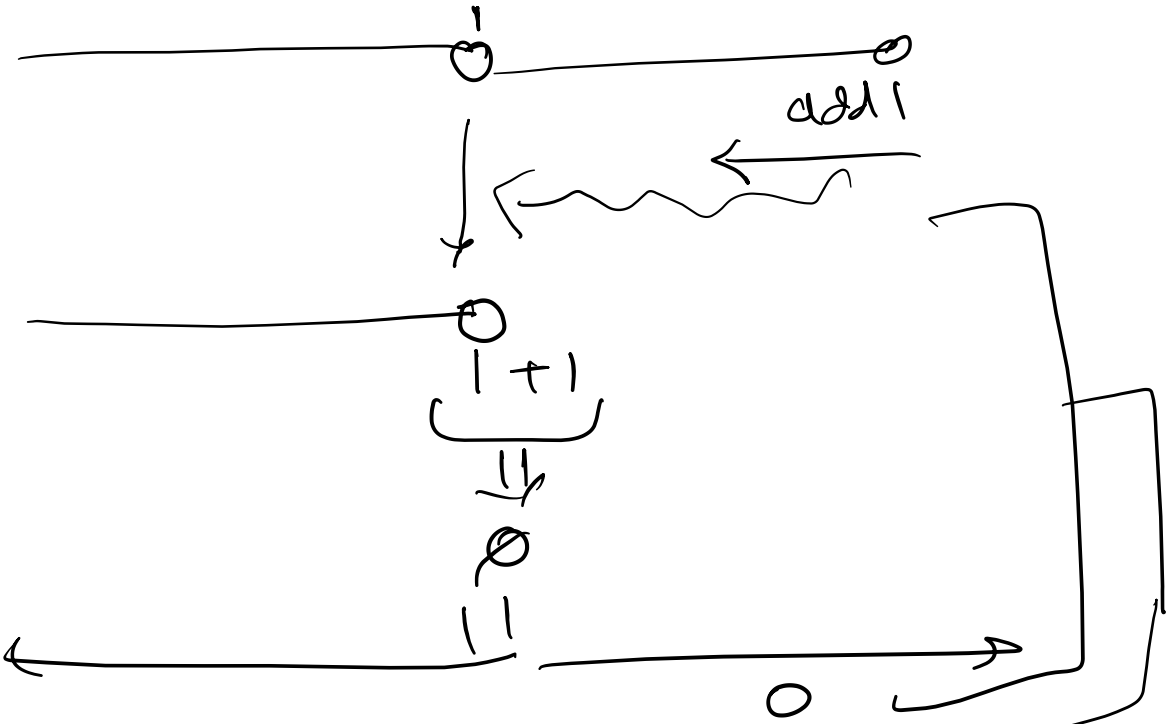
(4) Smallest number exceeding N whose k^{th} bit is set



→ if k^{th} bit is 0



→ if k^{th} bit is 1



Find least significant bit as 0 & set it.