Q1-2 **Binary Search**

Binary search algorithm is used to search any element to an array which is sorted the time ∴ Complexity of this algorithm is O(log n).

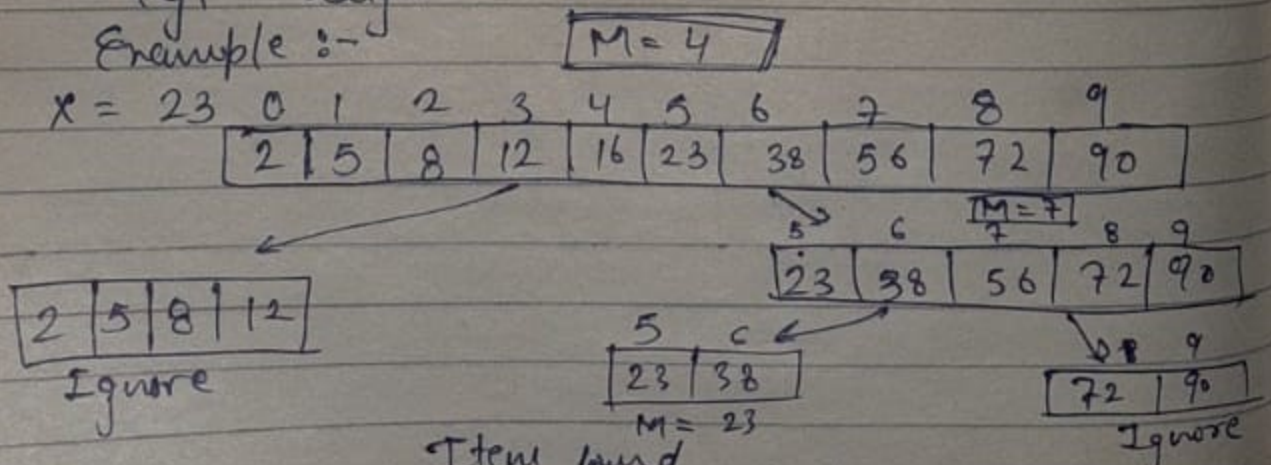
Unlike linear search in which we compare each and every element of the array with the element which is to be searched In binary search we use the fact that array is sorted.

let say we have to search for element x then:

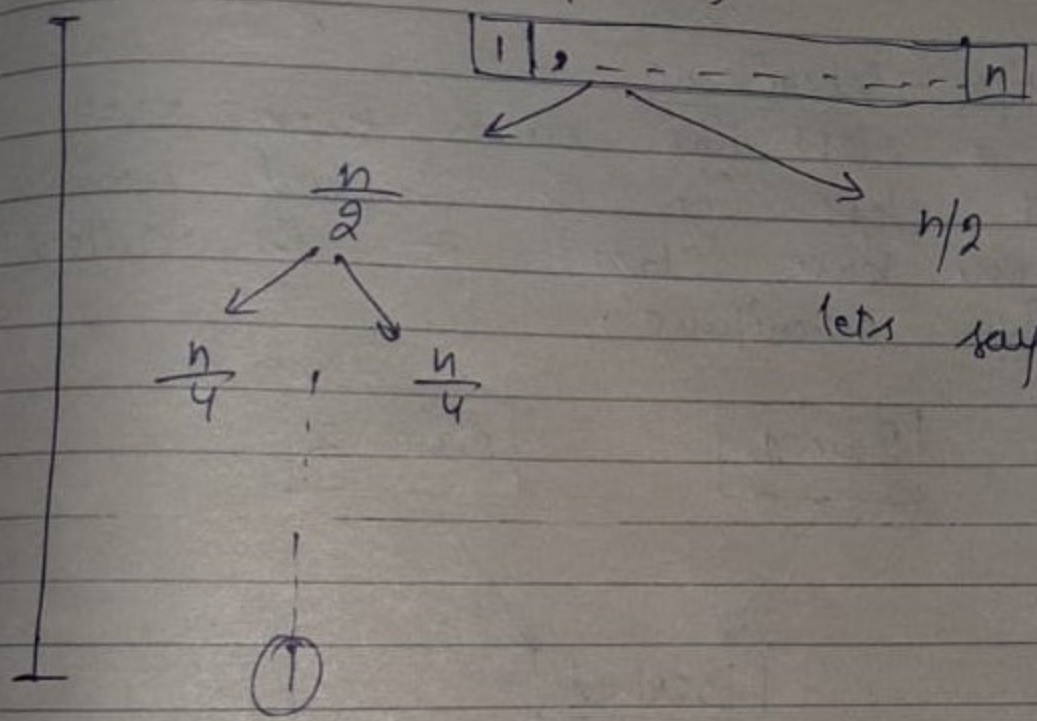
We basically ignore half of the elements just after one comparison.

* Compare x with the middle element.
* If x matches with middle element, we return the mid index.
* Else if x is greater than the mid element, then x can only lie in the right half subarray after the mid element. So, we recurse for right half.
* Else (x is smaller) recur for the left half.

Example :-



for time complexity



lets say we ignore

total time = $\log_2 n$

in worst case

so time complexity is $O(\log n)$