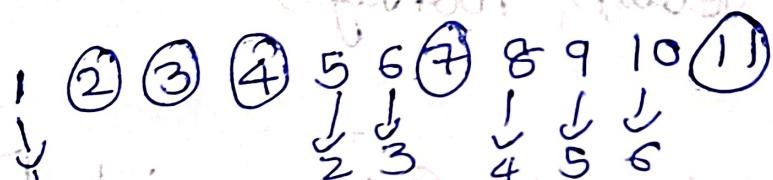


06/02/2026
Friday

Find the k^{th} missing Number

$$arr[] = [2, 3, 4, 7, 11] \quad k=5$$



5th missing Number

Here to find how many numbers are missed for an element

using formula that element

- (Index + 1)

$$\text{Missing Elements} = [1, 2, 3, 4, 5]$$

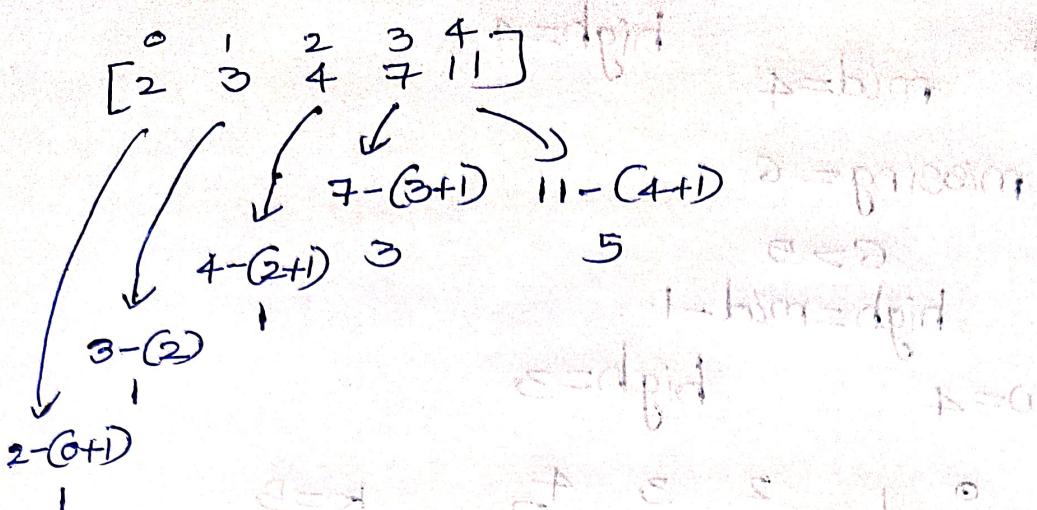
$$2, 3, 4, 7, 11$$

$$7 - 4 \rightarrow 3$$

$$11 - 5 \rightarrow 6$$

before 7 there are 3 nos missing

before 11 there are 6 nos missing



we take

low as 0

and high as $n-1$

$k=5$

low = 0

mid = 2

high = 4

For this $i[mid]$ till this element we check how many elements are missing by using formula

$$\text{missing} = \alpha[mid] - (\text{mid} + 1)$$

if missing $< k$ then

we go right side

$$\text{low} = \text{mid} + 1$$

else

$$\text{high} = \text{mid} - 1$$

i = 0 for loop right start

$$\text{missing} = 1$$

$$r < 5$$

$$\text{low} = \text{mid} + 1$$

$$\text{low} = 3 \quad \text{mid} = 3 \quad \text{high} = 4$$

$$\text{missing} = 3$$

$$3 < 5$$

$$\text{low} = \text{mid} + 1$$

low=4 mid=4

high=4

missing=6

$6 > 5$

high=mid-1

low=4

high=3

$\begin{bmatrix} 0 & 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 7 & 11 \end{bmatrix}$ $k=5$

high low

+ addit. \leftarrow bin. \leftarrow equal.

for answers

$a[high] + k - missing$

$a[high] + k - (a[high] - (high+1))$

$1 + high + k$

(high) is the formula or

\leftarrow low+k

$\begin{bmatrix} 4, 5, 6 \end{bmatrix}$ $k=3$

for this

$a[high] + more$

\leftarrow bin. then it is not possible

buz high goes to -1

int low=0;

i

\leftarrow 1

\leftarrow bin. \leftarrow equal

\leftarrow precond

\leftarrow 0

\leftarrow bin. \leftarrow equal

```
public int kthmissing (int[] a, int n)
{
    int low=0;
    int high=n-1;
    while (low <= high) {
        int mid = low + (high-low)/2;
        int missing = a[mid] - (mid+1);
        if (missing < k)
            low=mid+1;
        else
            high=mid-1;
    }
    return low+k or high+k
}
```