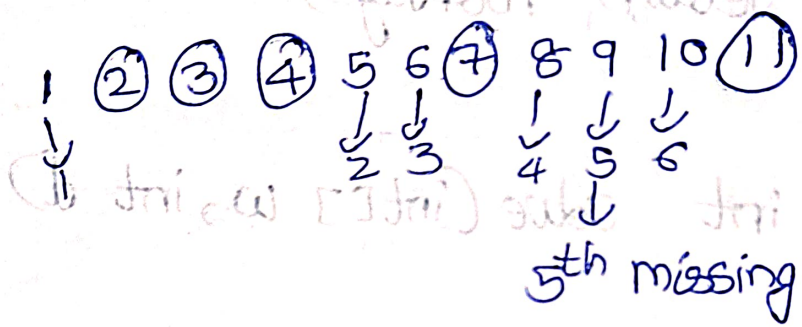


06/02/2025  
Friday

Find the  $k^{\text{th}}$  missing Number

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



Here to find how many numbers are missed for an element is

using formula that element - (index + 1)

arr[] = [1 2 3 4 5]

2 3 4 7 11

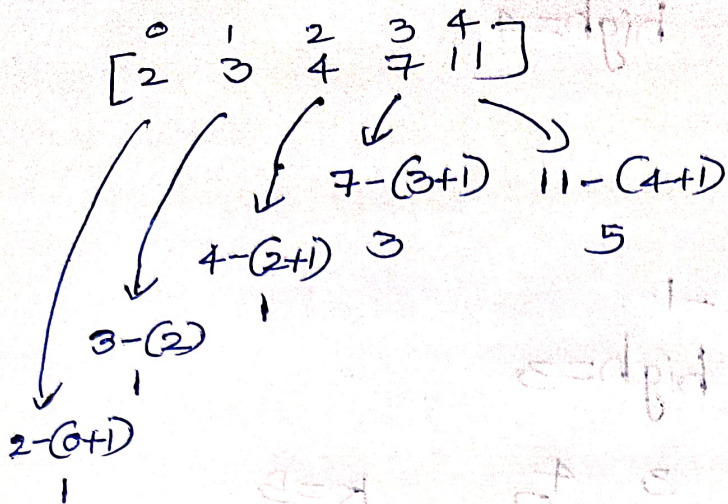
7 - 4 → 3

11 - 5 → 6

before 7 there are 3 no's missing

before 11 there are 6 no's missing





we take

low as 0

and high as  $n-1$  4

$k=5$

low = 0

mid = 2

high = 4

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

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

if  $\text{missing} < k$  then

we go right side

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

else

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

$$\text{missing} = 1$$

$$1 < 5$$

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

$$\text{low} = 3$$

$$\text{mid} = 3$$

$$\text{high} = 4$$

$$\text{missing} = 3$$

$$3 < 5$$

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



low=4

mid=4

high=4

missing=6

$6 > 5$

high=mid-1

low=4

high=3

0	1	2	3	4
2	3	4	7	11
			↓	↓
			high	low

K=5

for answers

$a[\text{high}] + K - \text{missing}$

$a[\text{high}] + K - (a[\text{high}] - (\text{high} + 1))$

$1 + \text{high} + K$

is the formula or

$\text{low} + K$

[4, 5, 6] K=3

for this

$a[\text{high}] + \text{more}$

then it is not possible

because high goes to -1

int low=0;

i



```
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 + 1 + k
```

```
}
```