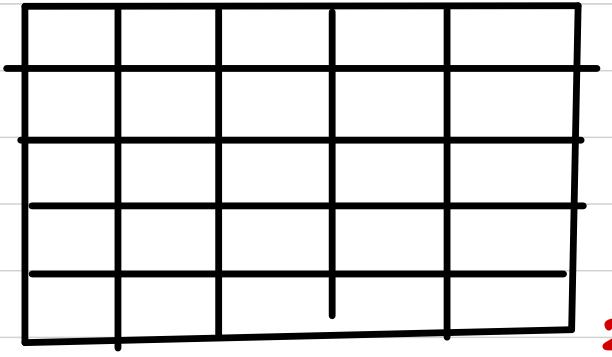
Multi dimensional arrays

Memory

Heap

Stack

2D array



2D array

2D array → Stack

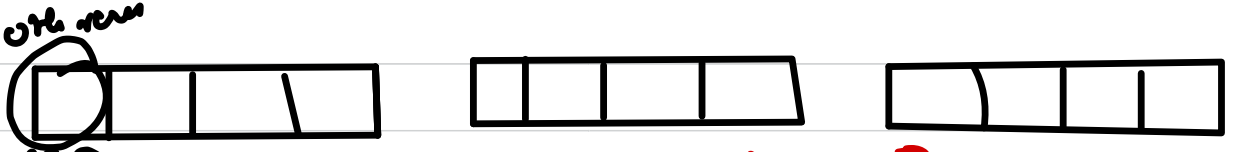
Form → 3 x 4

rows

colms

Row major

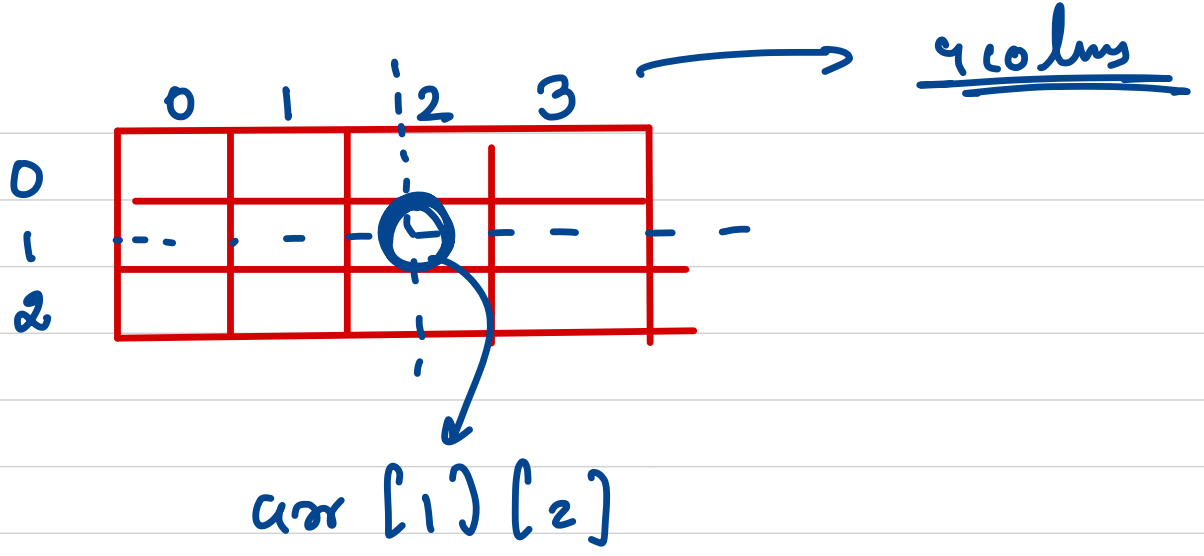
Col major



arr[3][4]

address

immediate follow


0 1 2 3
0
1
2
4 columns
3 rows
arr [1] [2]

Q» Given a matrix of $n \times m$ dimensions, when each row is sorted. Given a target element, Check if the target exists in the matrix.

1	2	3
9	17	18
2	6	13

target → 18

true

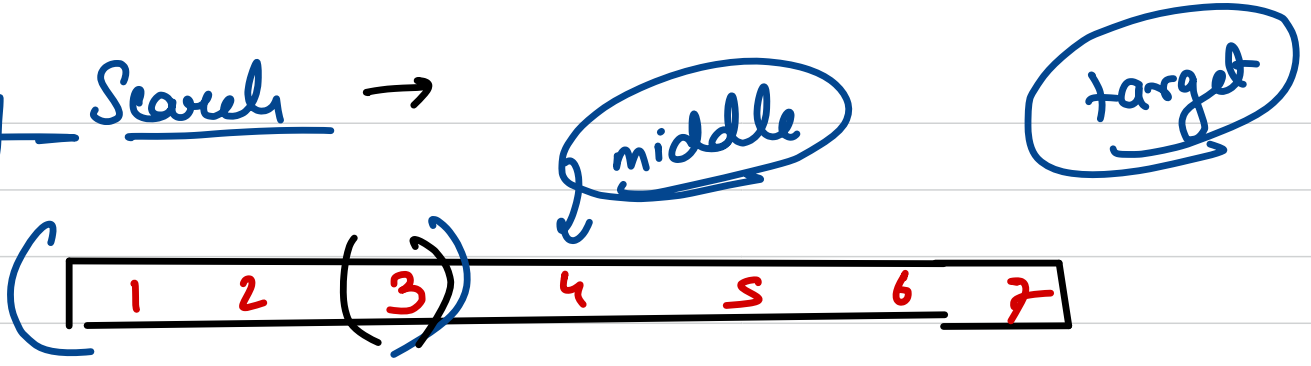
$n \times \log_2 m$

$O(n \log m)$

target => 7

false

Binary Search →

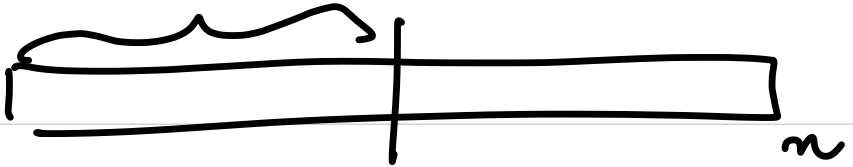


arr[mid] > target

Discard right half

arr[mid] < target

Discard left half



last term

$$n \longrightarrow \frac{n}{2} \longrightarrow \frac{n}{4} \longrightarrow \frac{n}{8} \cdots\cdots \frac{n}{2^k}$$

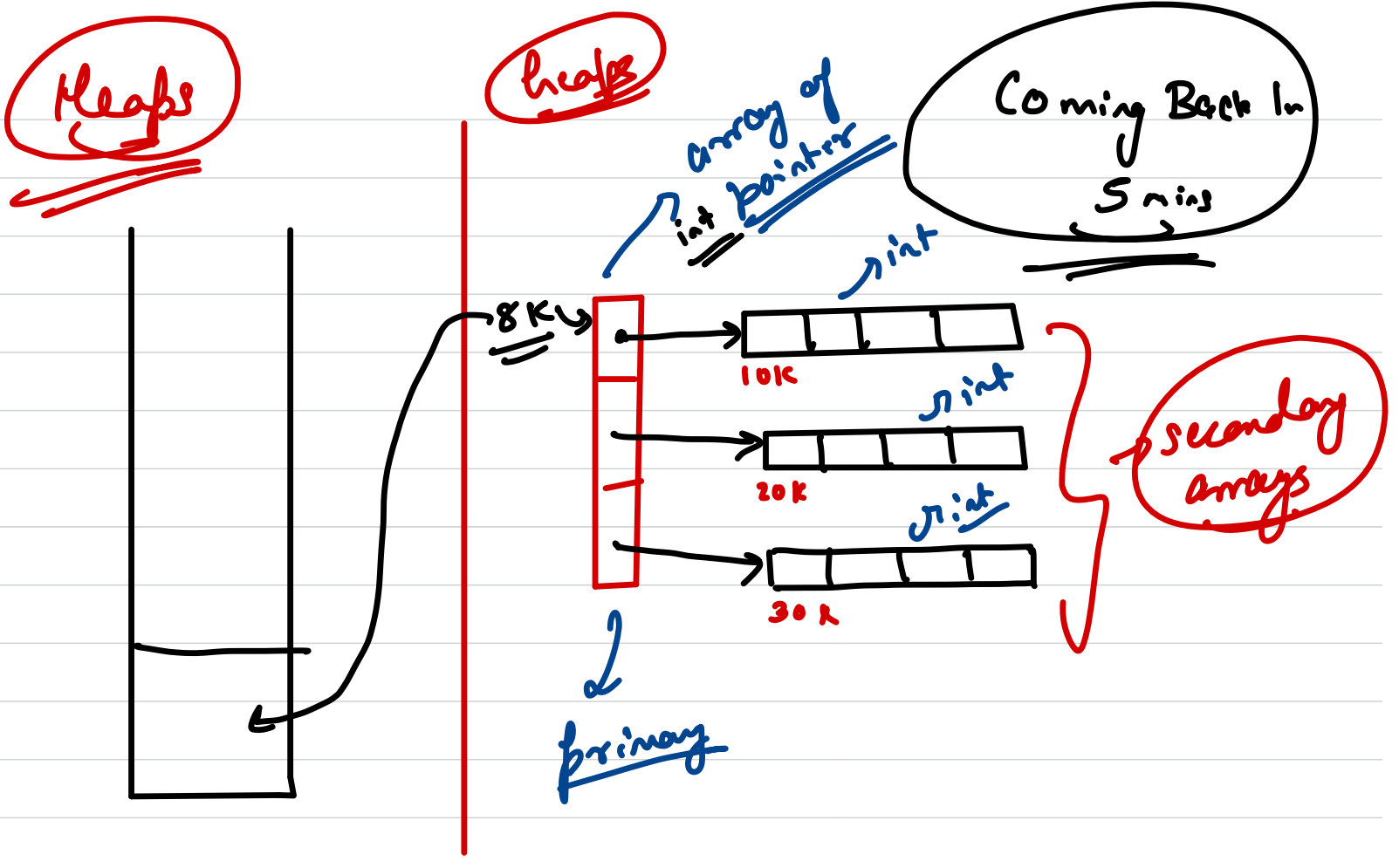
approx K steps

$$\frac{n}{2^k} = 1$$

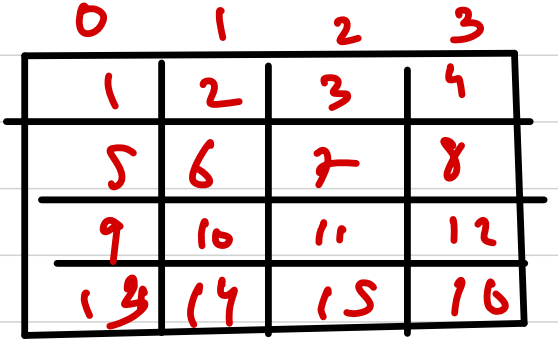
$$n = 2^k$$

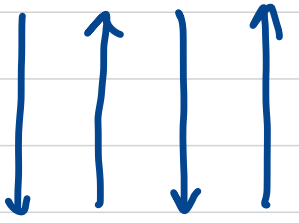
$$\log_2 n = \log_2 2^k$$

$$K = \log_2 n$$


Heaps
heaps
array of int pointer
Coming Back In 5 mins
8K
int
10K
int
20K
int
30K
secondary arrays
primary

Wave Print





N x M

1, 5, 9, 13, 14, 10, 6, 2, 3, 7, 11, 15

[6, 12, 8, 4

output