Saturday, 6 March 2021 8:20 PM

1 2 3 4 5 6 7 8

$n = 5$ [1, 2, 4, 8, 9] → 1

$c = 3$ → sort

$9 - 1 = 8$

1 (min, low) — left — right — 8 (max, high)

mid

1. Search space
2. mid → min distance b/w cows

mid ✓ → good

good or not??

Try to place all cows atleast mid distance apart

Ternary Search → 3

→ Linear Search

→ Binary Search → 2

Divide & Conquer algo

division of array | function into 3 parts.

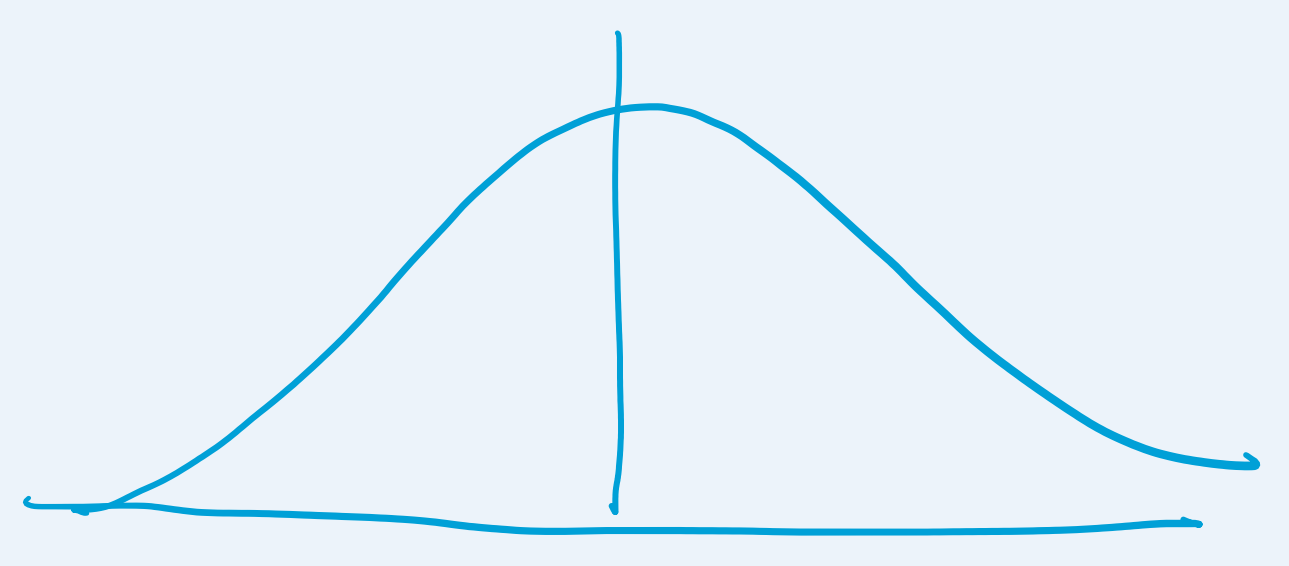
→ We have mid 1 and mid 2.

→ unimodal distribution

one peak

A unimodal distribution is a distribution with one clear peak or most frequent value.

→ The value increases at first, rises to a single peak and then it decreases.



normal distribution

1. Search space
2. Find mid 1 and mid 2

$mid1 = l + (r - l)/3$

$mid2 = r - (r - l)/3$

target = 6

1 2 3 4 5 6 7 8 9 10

$l = 0$, mid 1, mid 2

$l = mid1 + 1;$

key > arr[mid1] & key < arr[mid2]

$l = mid1 + 1;$

$r = mid2 - 1;$

For each iteration

Ternary Search → 4 comparisons

Binary search → 2 comparisons

$T(n) = T\left(\frac{n}{2}\right) + 2c$

$T(n) = T\left(\frac{n}{3}\right) + 4c$

Recurrence relation sol^n

BS → $T(n) = \frac{2c\log(n)}{\log(2)} + c_1$ (log(n))

TS → $T(n) = \frac{4c\log(n)}{\log(3)} + c_1$

$T(n) = 2c\log_2 n + O(1)$

$T(n) = 4c\log_3 n + O(1)$

Time Taken by Ternary search is $2\log_3 2$ times the time taken by BS.

Now since $2\log_3 2 > 1$

⇓

we get more comparisons with ternary search.

Ques: Given a quadratic equation $ax^2 + bx + c$.

Find the max and min value of the function possible when x is varied for all real values possible.

Eg: → $a = 1, b = -4, c = 4$

maxValue → ∞

min → 0

$x^2 - 4x + 4$ $x = 2$

→ 0

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	x	y
1 → 4	1	1
3		
2 → 5	1	2
4		

x → spe x = y → spe y

x 1 y

→ 1

1st → 2 copies

2nd → 1x, 1y

3rd → 4 copies — 1 x, 3 copy

3rd sec → k

3rd sec → 4 copies 1 org

0 left — mid — right → max(x, y) * n

mid → good or bad

n copies

represents time it takes to make n copies.

mid → good