PW SKILLS

Square root of a given number

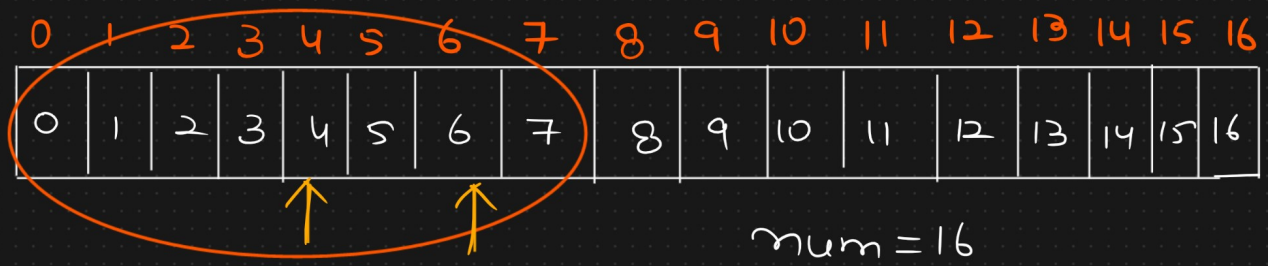
num = 16

result = 4

num = 12

↳ floor value

result = 3



Binary search

num = 16

mid = (0 + 16)/2 = 8

low = 0

high = 16

val = 8 * 8 = 64

while (low <= high) 64 > 16

val > num

high = mid - 1

low = 0 ——— ①

high = 7

mid = (0 + 7)/2 = 3

val = 3 * 3 = 9

9 < 16

val < num ② floor

result = mid

low = mid + 1

result = 3

low = 4

high = 7

$$mid = \frac{4+7}{2} = 11/2 = 5$$

$$val = 5 * 5 = 25$$

$$25 > 16$$

$$high = 6$$

$val == num$ → Perfect square root

return mid

return result

low = 4, high = 6

mid = 5

$25 > 16$

high = 5

$$mid = (4+5)/2 = 4$$

$val = 16 == 16$

2 → 4 → final result

$$\begin{cases} \text{Time complexity} = O(\log n) \\ \text{Space complexity} = O(1) \end{cases}$$