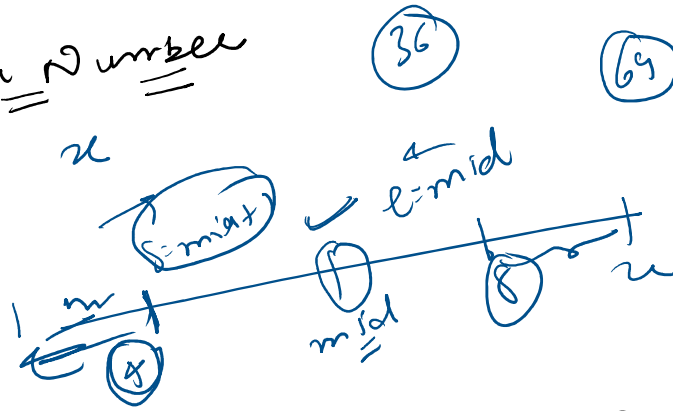


3.2 - Binary Search - 2

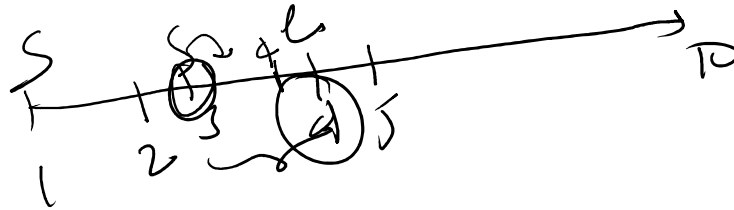
Saturday, July 12, 2025 10:49 AM

Square Root of a Number n



10

$e=3$
 $s=4$



mid $\frac{s+e}{2}$ $\frac{10+1}{2}$
might overflow

$$\left\lfloor \frac{s+(e-s)}{2} \right\rfloor = \text{mid}$$

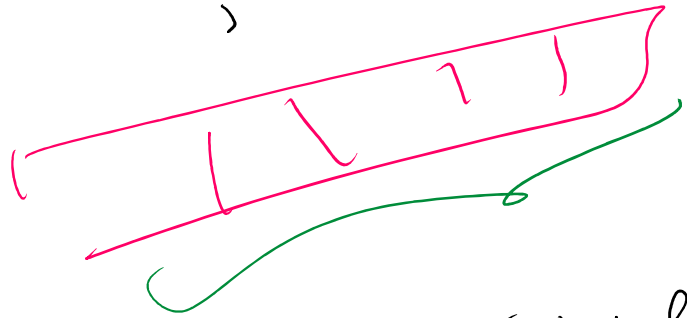
$$\frac{2s + e - s}{2} = \frac{s+e}{2}$$

Binary Search on a 2D matrix

for $(i=0; i < n; i++)$
 $\{ \text{arr}[i], n \}$

for (i = 0; i < arr[i], n);

$\Rightarrow m+n$



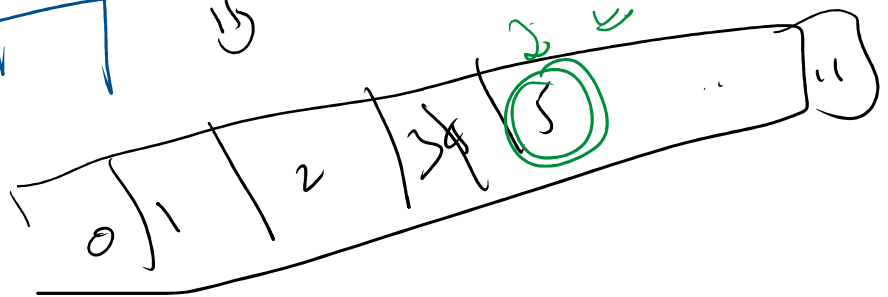
[Property]

$$\log(m+n) \Rightarrow \log(m) + \log(n)$$

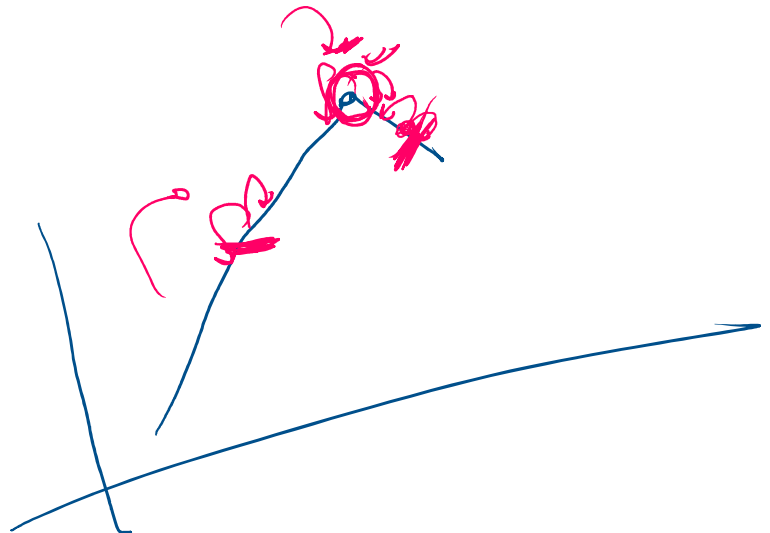
0	1	2
3	4	5
6	7	8
9	10	11

$$r = 4$$

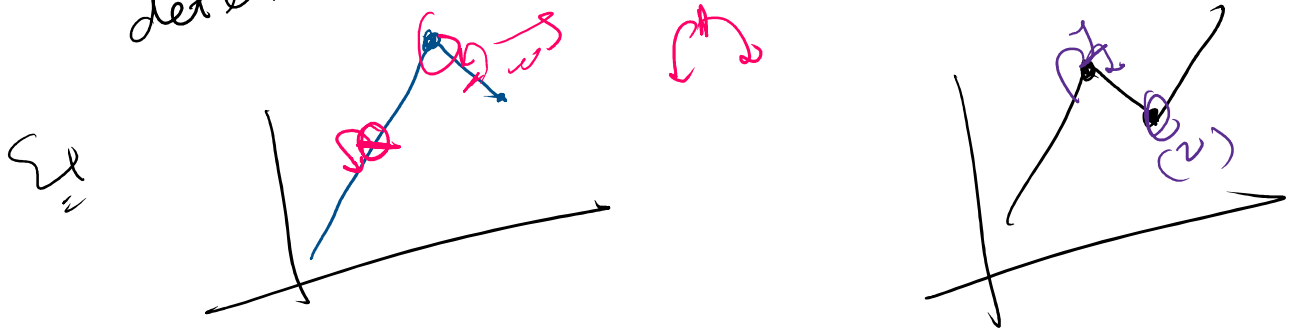
$$c = 3$$



Mountain Peak



d If the array is sorted in multiple parts then
 the point of change will have some unique
 property. For rest of the halves, just try to
 determine in which half you are standing



Binary Search on answer space

```

s = min } 0
e = max } 100
while (s <= e) {
  mid = (s + e) / 2
  if (isPossible(mid)) {
    ans = mid
    s = mid + 1
  }
  else e = mid - 1
}
  
```