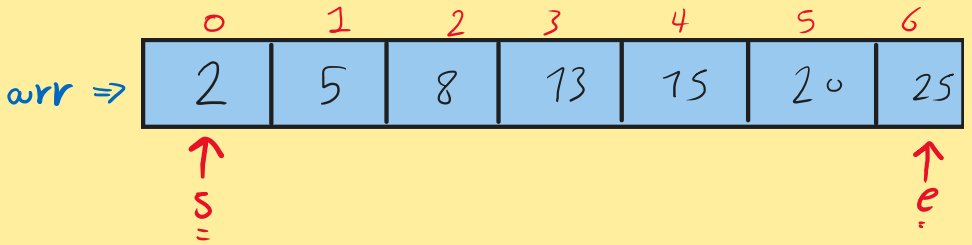
Binary search Algorithm

- Binary search can only be applied if the given array is sorted.

1. it takes two points
   - (s): in the first element of the array
   - (e): in the last element of the array
2. Calculate the mid: $mid = \frac{s+e}{2}$
3. if the key == arr[mid] → return mid
   if the key < arr[mid] → e = mid - 1
   if the key > arr[mid] → s = mid + 1

Example for Binary search:



- key = 5

$mid = \frac{s+e}{2} = \frac{0+6}{2} = 3$

arr[mid] (13) > key (5) → e = mid - 1

---

s = 0 e = 2

$mid = \frac{0+2}{2} = 1$

key (5) = arr[mid] (5) → return mid

∴ The key (5) is at POS (1)