Binary Search

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Key = 33

[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
11	22	33	44	55	66	77	88	99

left — Left sub array — mid — Right sub array — right

1) Get the key from the user.
2) Calculate the left,right and mid index
   Left = 0
   Right = size-1 = 8
   Mid = (left+right) / 2
   = (0+8)/2 = 4
   = 4
3) Compare the key with the element at mid
   33 == arr[mid]
   33 == 55 ?
   If yes return the index,
   Else, go to step 4
4) Check if the key is smaller to element at mid or greater
   If the key is smaller, consider left sub array
   If the key is greater, consider right sub array

Left sub array = left to mid -1
In Left sub array, left variable remains the same
Right variable changes to mid -1

Right sub array is from mid + 1 to right
In right sub array, right variable remains the same
Left variable changes to mid + 1

[0]	[1]	[2]	[3]
11	22	33	44

Left mid right

As the key is smaller, consider left sub array
Left sub array starts from left to mid-1

Start from step 2
2) Left = 0
   Right = mid-1 = 4-1
   = 3
   Mid = (left + right) /2
   = (0+3)/2
   = 1
3) Compare the key with the mid element
   33 == arr[mid]
   33 == 22 ?
   No, so go to step 4
4) Check if key is smaller or greater to mid element
   Consider right sub array as key is greater to 22

   Right sub array is mid+1 to right

[2]	[3]
33	44

Left right
mid

Start from step 2
Left = mid + 1 = 1+1 = 2
Right = 3
Mid = (2+3)/2
= 2

3) Compare the key with mid element
   33 == arr[mid]
   33 == arr[2]
   Yes
   Key found at index 2