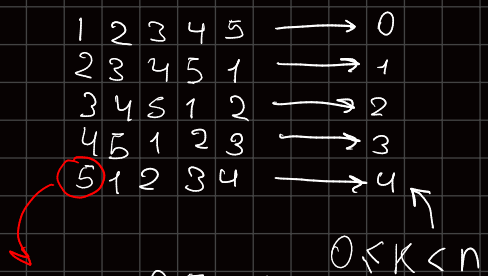
Ejercicio 8. Given an array $A[1..n]$, a k-rotation of A is an array $B[1..n]$ such that

$$B(i) = \begin{cases} A[i+k] & i+k \leq n \\ A[(i+k) \mod n] & \text{otherwise} \end{cases}$$

For example, if $A = [3, 6, 9, 10]$, a 2-rotation of A is $B = [9, 10, 3, 6]$.

Consider the following problem. Input: A k-rotation B of an array sorted in ascending order of distinct elements. Output: The number k. For example, if $B = [9, 10, 3, 6]$, the algorithm should return the value 2.

Design a $\Theta(\lg n)$ worst-case time algorithm for the problem. Write the pseudocode of the algorithm. Write a recurrence for the worst-case of this algorithm. Verify with the master theorem.



B[1] = A[1+4]

5 = 5

```
Algo (B, l, r)  // Devuelve la rotación de B[l,r]
  if (l == r)
    return 0
  m = ⌊(l+r)/2⌋
  if A[l] < A[m+1]
    return Algo(B, m+1, r)        ← coincide
  else
    return Algo(B, l, m) + (r-l+1)/2   ← desfase
```