

```

BINARY-SEARCH(A, e, begin, end)
    if begin >= end then
        if A[begin] != e then
            return False
        else return True
    middle = (begin + end) / 2
    if A[middle] > e then
        return BINARY-SEARCH(A, e, begin, middle)
    if A[middle] < e then
        return BINARY-SEARCH(A, e, middle, end)

```

$$T(n) = \begin{cases} c & \text{if } n = 1 \\ T(n/2) + c & \text{if } n > 1 \end{cases} \quad (1)$$

By recurrence, if $n > 1$, $T(n) = \sum_{k=0}^{\lg(n)} c$
 $\Rightarrow T(n) = c \lg(n)$
 $\Rightarrow \text{The algorithm is } \Theta(\lg n)$