Binary Search

Algorithm Searching an element in a sorted array by iterative method

```
procedure BinarySearch($A \leftarrow$ *sorted array* , $x \leftarrow$ *target*)
    $l \leftarrow 0$
    $r \leftarrow [(length\ of\ A)\ - 1]$
    while $l \leq r$ do
        $m \leftarrow \lfloor l + (r-1)/2) \rfloor$
        if $A[m] == x$ then
            return $m$
        end if
        if $A[m] > x$ then
            $r \leftarrow (x-1)$
        else
            $l \leftarrow (x+1)$
        end if
    end while
    return $-1$
end procedure
```

Algorithm Searching an element in a sorted array by recursive method

```
procedure BinarySearch($A \leftarrow$ *sorted array*, $l \leftarrow$ *left bound*, $r \leftarrow$ *right bound*, $x \leftarrow$ *target*)
    if $l > r$ then
        return $-1$
    end if
    $m \leftarrow \lfloor l + (r-1)/2) \rfloor$
    if $A[m] == x$ then
        return $m$
    end if
    if $A[m] > x$ then
        return $BinarySearch(A, l, m-1, x)$
    else
        return $BinarySearch(A, m+1, r, x)$
    end if
end procedure
```