

Binary Search.

```
def binary_search(s_list, x):
    """Find the position p (0 <= p <= len(s_list)) where element x
    should be _inserted_ in list s_list, which should be sorted
    in _increasing_ order. (Insertion might mean: _Replace_ an
    element which is already present in s_list.)"""

    # Length of the list:
    n = len(s_list)

    # Simple case:
    if s_list[0] >= x:
        return 0
    if x > s_list[-1]:
        return n

    # Otherwise: s_list[0] < x <= s_list[n-1]
    left = 0
    right = n-1

    # So we have s_list[left] < x <= s_list[right];
    # we shall _maintain_ these inequalities during
    # the following loop:
    while (right - left) > 1:
        # mid = largest INTEGER <= (right + left) / 2:
        # Symbol "://" means "integer division"; not
        # to be confused with "normal" division "/".
        mid = (right + left) // 2
        if x <= s_list[mid]:
            right = mid
        else:
            left = mid

    return right
```