Algorithm 3.1.44 List insertion based on binary search for a sorted list.

```
1: procedure BINARY INSERT(x: object; a_1, a_2, ..., a_n: sorted list of objects)
2:     i ← 1
3:     j ← n
4:     while i < j do                                   ▷ Binary search.
5:         m ← ⌊(i+j)/2⌋
6:         if x > a_m then
7:             i ← m + 1
8:         else
9:             j ← m
10:        end if
11:    end while                                        ▷ End binary search.
12:    for k = (n + 1) to (i − 1) do                    ▷ Make room for x.
13:        a_k ← a_{k−1}
14:    end for
15:    if i > n then                                    ▷ x is the greatest element.
16:        a_{i+1} ← x
17:    else                                             ▷ The index for x is less than n + 1
18:        a_i ← x
19:    end if
20:    return a_1, a_2, ..., a_{n+1}
21: end procedure
```