**Algorithm 3.1.15** insert an integer $x$ at the correct index position in a list of integers in increasing order

1: **procedure** INSERT($x$: integer; $a_1, a_2, \ldots, a_n$: integers in increasing order)
2:     **if** $a_n \leq x$ **then**
3:         $a_{n+1} \leftarrow x$
4:     **else**
5:         $i \leftarrow n$
6:         **while** $i$ and $(x < a_i)$ **do**              $\triangleright$ make room for x
7:             $a_{i+1} \leftarrow a_i$
8:             $i -= 1$
9:         **end while**
10:         $a_{i+1} \leftarrow x$
11:     **end if**
12:     **return** $a_1, a_2, \ldots, a_{n+1}$
13: **end procedure**