The following algorithm inserts an element at the end of a linked list. Assume that the list is sorted in increasing order, and that \( x \) holds a value \( \text{key}[x] \). Under these assumptions, modify the algorithm to insert the element in its right position in the sorted list.

List-Insert-Sorted(\( L, x \))

solution:

1. \( \text{next}[x] = \text{NIL} \)
2. if \( \text{head}[L] = \text{NIL} \)
3. then \( \text{head}[L] = x \)
4. else
5. \( y \leftarrow \text{head}[L] \)
6. while \( y \neq \text{NIL} \) do
7. \( z \leftarrow y \)
8. \( y \leftarrow \text{next}[y] \)
9. \( \text{next}[z] \leftarrow x \)
10. add: \( \text{next}[x] \leftarrow y \)