Upper–lower bounds

Write a program, which finds the smallest integer bigger than or equal to X in a sorted array of integers with time complexity $O(log(N))$. If there is no such element return an appropriate message.

Input
searched integer $-10^{16} < X <= 10^{16}$

Output
upper bound (*if there exist such integer X - return it, if not return the smallest integer bigger than X in the array, or an appropriate message if there is no such element*).

Do the same for the lower bound.