Bi-increasing vector

In this problem, we say that a vector with \( n \) integer numbers \( v[0..n-1] \) is \textit{bi-increasing} if \( n \geq 2, v[0] > v[n-1] \), and there exists an index \( j \) between 0 and \( n-2 \) such that:

- \( v[0] \leq \ldots \leq v[j-1] \leq v[j] \),
- \( v[j+1] \leq v[j+2] \leq \ldots \leq v[n-1] \).

For instance, the vector \([12, 12, 15, 20, 1, 3, 3, 5, 9]\) is bi-increasing (with \( j = 3 \)).

Implement an \textit{efficient} function

\[
\text{bool search (int } x, \text{ const vector <int>& v);} \\
\]

such that, given an integer number \( x \) and a bi-increasing vector \( v \), returns if \( x \) is in \( v \) or not. You can use and implement auxiliary functions if you need them.

**Precondition**

The vector \( v \) is bi-increasing.

**Observation**

You only need to submit the required procedure; your main program will be ignored.

**Problem information**

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Generation: 2017-02-14 22:59:55

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