Computing $M[i]$

Let $M[i]$ denote the length of the longest increase substring that ends at x_i.
Then:

1. $M[1] = 1$.
   - Because x_1 is the longest increasing substring that ends at x_1
2. $M[i] = 1$ if $x_{i-1} \geq x_i$ and $i \geq 2$
   - Because x_i is the longest increasing substring ending at x_i when $x_{i-1} \geq x_i$
3. $M[i] = 1 + M[i-1]$ if $x_{i-1} < x_i$ and $i \geq 2$
   - Because the longest increasing substring ending at x_i in this case is formed by appending x_i to the longest increasing substring ending at x_{i-1}