DP Algorithm for the Longest Increasing Subsequence

Let $Q[i]$ denote the length of the longest increasing subsequence that ends at x_i.

Then $Q[1] = 1$

Let $Pred[i]$ denote the set of indices j where:

- $1 \leq j < i$
- $x_j < x_i$

Then

- $Q[i] = 1$ if $Pred[i] = \emptyset$ and
- $Q[i] = \max\{Q[j] + 1 | j \in Pred[i]\}$ else

For $X = 1, 3, 4, 1, 2, 8$:

- $Pred[1] = \emptyset$
- $Pred[2] = \{1\}$
- $Pred[3] = \{1, 2\}$

Class exercise: computing remaining entries of $Pred$ array.