3 Basic Sorting Algorithms

Bubble Sort

ALGORITHM *BubbleSort(A[0..n-1])*

// Sorts a given array using bubble sort

// Input: An array A[0..n-1] of orderable elements

// Output: Array A[0...n-1] sorted in ascending order

for i← 0 **to** n - 2 **do**

  for j ← 0 **to** n - 2 - i **do**

    if A[j+1] < A[j]

      swap A[j] and A[j+1]

Selection Sort

ALGORITHM *SelectionSort(A[0..n-1])*

// Sorts a given array using selection sort

// Input: An array A[0..n-1] of orderable elements

// Output: Array A[0...n-1] sorted in ascending order

for i← 0 **to** n - 2 **do**

  min ← i

  for j ← i + 1 **to** n - 1 **do**

    if A[j] < A[min]

      min ← j

  swap A[i] and A[min]

Insertion Sort

ALGORITHM *InsertionSort(A[0..n-1])*

// Sorts a given array using insertion sort

// Input: An array A[0..n-1] of orderable elements

// Output: Array A[0...n-1] sorted in ascending order

for i← 1 **to** n - 1 **do**

  v ← A[i]

  j ← i - 1

  while j >= 0 **and** A[j] > v **do**

    A[j + 1] ← A[j]

    j ← j - 1

  A[j + 1] ← v