Analysis of Algorithms: Assignment 1
Due date: January 13 (Thursday)

Let \( A[1..n] \) be an array of \( n \) distinct numbers. If \( i < j \) and \( A[i] > A[j] \), then the pair \((i, j)\) is called an inversion. For example, the array \( \langle 2, 3, 8, 6, 1 \rangle \) contains five inversions.

**Problem 1** (2 points)
What array with elements from the set \{1, 2, ..., n\} has the most inversions? How many inversions does it have?

**Problem 2** (4 points)
Give an algorithm that inputs an array and outputs the number of inversions in the array. You may assume that all elements of the array are distinct.

**Problem 3** (4 points)
Estimate the worst-case running time of your algorithm.