(n(n+1))/2

1. Algorithm Terminology
   1. Algorithm
      1. A well-defined computational procedure that takes some value, or set of values, as input and produces some value, or set of values, as output.
      2. Solved a well-specified computational problem
         1. Example computational problems
            1. Find the smallest number

Input: a sequence of numbers

Output: a number a such that a <= ai

A sequence input is called an instance of the problem.

* + - * 1. Sorting problem

Input: a sequence of numbers

Output: a permutation of the input

* + 1. Origin
       1. Etymology: Word stems from Persian mathematician named Al Khawarizmi
       2. Concept: precedes Al Khawarizmi with:
          1. The Sieve of Erathostenes

Finds prime numbers

* + - * 1. Euclid’s Algorithm

Finds the greatest common divisor of two numbers

* 1. Correctness
     1. Contradiction
     2. Induction
     3. Loop invariants
  2. Running time, time complexity
     1. Worst-case, average-case, and best-case running time
     2. How to measure:
        1. Choose an action/operation of the algorithm
        2. Count and express the number of actions as a function of the input size
  3. Space complexity
  4. Pseudocode
     1. Similar to languages such as
        1. Pascal, C, Java
        2. Plain language used to describe method used
     2. Ignores implementation details or software engineering issues
     3. Example
        1. Find-Smallest(A)
           1. Smallest = largest possible number
           2. For j = 1 to A.length //# of elements in a

If(A[j] < smallest)

Smallest = A[j]

Return(smallest)