Exercise 2.1

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2. See insertion_sort_d.cpp

3. Algorithm for Linear Search:

Algorithm 1 Linear Search

Input: a sequence of n numbers A and a value v
Output: *nil* if no such value exists in the sequence; index of this value otherwise

```
1: i ← 0
2: for j ← 1 to A.length do
3:     if A[j] == v then
4:         i ← j
5:         break
   return i
```

4. Algorithm for adding two n-digit binary number:

Algorithm 2 adding two n-digit binary number

Input: two arrays A,B with length n storing two n-digit binary number
Output: array C with length $(n+1)$ storing the sum of numbers stored in A and B

```
1: o ← 0
2: for i ← A.length to 1 do
3:     C[i+1] = o xor (A[i] xor B[i])
4:     o = (o logical and (A[i] xor B[i])) logical or (A[i] logical and B[i])
5: C[1] = o
6: return C
```