C++ Exercise 4: Running time and abstract data types

1. **Running time.** Find the best-case and worst-case running times for the algorithms below, by analyzing home many times each line is evaluated, in terms of the input size. The input size is n, which is the length of the input list A.

    (a) BUBBLE-SORT

    ```
    1  for m = A.length downto 2
    2      for i = 1 to m − 1
    3          if A[i] > A[i + 1]
    4              swap(A[i], A[i + 1])
    ```

    (b) BETTER-BUBBLE-SORT

    ```
    1  for m = A.length downto 2
    2      sorted = true
    3      for i = 1 to m − 1
    4          if A[i] > A[i + 1]
    5              swap(A[i], A[i + 1])
    6              sorted = false
    7      if sorted = true
    8          return
    ```