CSCI 204 Sorting Activity 1

Student name(s)_____

Rewrite the bubble sort function that was given in the lecture so that the loop would stop, i.e., sorting is finished, when the list is completely sorted.

In the lecture notes, we have the following bubble sort function.

```python
def bubble_sort( the_seq ):
  n = len( the_seq )
  for i in range( n - 1, 0, -1 ) :
    for j in range( i ) :
      if the_seq[j] > the_seq[j + 1] :
      # swap the the items
        tmp = the_seq[j]
        the_seq[j] = the_seq[j + 1]
        the_seq[j + 1] = tmp
```

The function works correctly, but when the list has been sorted, the loops will continue until the index **i** and **j** reaches their pre-defined boundary. In many cases, the list is sorted when the loop indices do not reach their boundaries yet. For example, in the following case, the numbers are all sorted, but the loops will continue another 6 rounds. Your task is to add some condition(s) so that these extra loops can be eliminated.

| 10 | 2 | 18 | 4 | 31 | 13 | 5 | 23 | 51 | 29 | 64 |

| 2 | 10 | 4 | 18 | 13 | 5 | 23 | 31 | 29 | 51 | 64 |

| 2 | 4 | 10 | 13 | 5 | 18 | 23 | 29 | 31 | 51 | 64 |

| 2 | 4 | 10 | 5 | 13 | 18 | 23 | 29 | 31 | 51 | 64 |

| 2 | 4 | 5 | 10 | 13 | 18 | 23 | 29 | 31 | 51 | 64 |