Exercise 2

Lesson 2, Exercise 2

Please answer the following questions:

- You are trying to develop a new program which requires to sort the following set of numbers 7 34 8 6 12 2 1 5 3 4 in ascending order. Write down as a first method, the simplest algorithm to solve this problem based on a flowchart or pseudocode. Think how can you improve the 1st method to be more efficient.

Return in writing the answers by email, in text format or PDF

Lesson 1

Begin
Start with 7, 7<34, no swap (7,34,8,6,12,2,1,5,3,4)
continue with 8, 34>8, then swap, 8>7, no swap (7,8,34,6,12,2,1,5,3,4)
continue with 6, 6<7, then swap (6,7,8,34,12,2,1,5,3,4)
continue with 12, 12>6, no swap, 12>7, no swap, 12>8 no swap, 12>34 swap
(6,7,8,12,34,2,1,5,3,4)
continue with 2, 2<6, then swap (2,6,7,8,12,34,1,5,3,4)
continue with 1, 1<2, then swap (1,2,6,7,8,12,34,5,3,4)
continue with 5, 5>1, no swap, 5>2, no swap,5<6, then swap (1,2,5,6,7,8,12,34,3,4)
continue with 3, 3>1, no swap, 3>2, no swap,3<5, then swap (1,2,3,5,6,7,8,12,34,4)
continue with 4, 4>1, no swap, 4>2, no swap,4< 3 no swap, 4<5, then swap
(1,2,3,4,5,6,7,8,12,34)
stop

2nd method: sort by pair through all the list, right to left

begin
start with 7 and 34, 7<34, no swap, 34 and 8, 8<34, then swap, 34 and 6, 6<34 then swap,
34 and 12, swap, 34 and 2, swap,34 and 1 swap, 34 and 5 swap, 34 and 3 swap, 34 and 5
swap (7,8,6,12,2,1,5,3,4,34)
continue with 7 and 8, no swap, 8 and 6 swap, 8 and 12, no swap, 12 and 2 swap, 12 and
1 swap, 12 and 3 swap, 12 and 4 swap, 12 and 34 no swap (7,6,8,2,1,5,3,4,12,34)
continue with 7 and 6, swap, 7 and 8 no swap, 8 and 2 swap, 8 and 1 swap, 8 and 5 swap,
8 and 3 swap, 8 and 4 swap, 8 and 12 no swap, 12 and 34 no swap (6,7,2,1,5,3,4,8,12,34)
continue 6 and 7, no swap, 7 and 2 swap, 7 and 1 swap, 7 and 5 swap, 7 and 3 swap, 7
and 4 swap, 7 and 8 no swap, 8 and 12 no swap, 12 and 34 no swap
(6,2,1,5,3,4,7,8,12,34)
continue 6 and 2, swap, 6 and 1 swap, 6 and 5 swap, 6 and 3 swap, 6 and 4 swap, 6 and
7 no swap, , 7 and 8 no swap, 8 and 12 no swap, 12 and 34 no swap
(2,1,5,3,4,6,7,8,12,34)
continue 2 and 1 swap, 2 and 5 no swap, 5 and 3 swap, 5 and 4 swap ,5 and 6 no swap, ,
6 and 7 no swap, , 7 and 8 no swap, 8 and 12 no swap, 12 and 34 no swap
(1,2,3,4,5,6,7,8,12,34)
stop

Lesson 1

array = [7, 34, 8, 6, 12, 2, 1, 5, 3, 4]
Algorithm=Insertion sort
step 1:
Compare second element with the first element in the array. If the second element is smaller then swap them. Else continue to the third element.
output
[7, 34]
step 2:
Move to the third element in the array and compare it with the first two elements and put it to its correct position.
[7, 8, 34]
step 3:
Move to the fourth element in the array and compare it with the first three elements and put it to its correct position.
[6, 7, 8, 34]
step 4:
Move to the fifth element and compare it with the first four elements and put it to its correct position.
[6, 7, 8, 12, 34]
step 5:
Move to the sixth element and compare it with the first five elements and put it to its correct position.
[2, 6, 7, 8, 12, 34]
Repeat until the entire array is sorted in ascending order.
Print sorted array: [1, 2, 3, 4, 5, 6, 7, 8, 12, 34]