

Questions

1) a) State the purpose of the algorithm below. [1]



```
function subr(arr)
    completed = false
    while completed == false
        completed = true
        for counter = 0 to arr.length - 2
            if arr[counter] > arr[counter+1] then
                temp = arr[counter]
                arr[counter] = arr[counter+1]
                arr[counter+1] = temp
                completed = false
            endif
        next counter
    endwhile
    return arr
endfunction
```



b) Give the name of a more efficient algorithm for achieving the same purpose. [1]

c) Give **three** reasons why a programmer would prefer to use the less time efficient algorithm from (a). [3]

2) A bubble sort is to be used to sort the array [3, 4, 8, 9, 10, 11].

a) How many passes are needed to sort this array? [1]

b) Explain your answer to (a). [1]

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3) The array [8, 3, 4, 10, 11, 9] is to be sorted.

- a) A bubble sort is to be used. Show the missing steps when a change is applied to the array. [4]

8	3	4	10	11	9
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- b) An insertion sort is to be used. Show the array at the end of each pass. [3]

8	3	4	10	11	9
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- c) A merge sort is to be used to sort the array [4, 6, 1, 2, 9, 3, 5, 8]. Show the missing stages of the merge sort. [3]

[4, 6, 1, 2, 9, 3, 5, 8]

[4] [6] [1] [2] [9] [3] [5] [8]

[1, 2, 3, 4, 5, 6, 8, 9]

- c) A merge sort is to be used to sort the array [8, 3, 4, 10, 11, 9]. Show the stages of the merge sort. [5]

