

Task 03

Id 121301499

The modified code's run time complexity is $\Theta(n)$ for the best case. Here, best case means if an already sorted array is given.

Explanation:

Before entering the nested for loops, ~~the~~ it runs another if loop which we call 'tester loop' according to my modified code.

Now this 'tester loop' checks whether the given array is already sorted or not. If the given array is ^{not} sorted the the variable ans will be assigned to a value "not sorted".

Furthermore, the nested loops will only run when value of variable (ans) will be "not sorted." Now, the tester loop iterates through all the element of the given array which takes $\Theta(n)$ time. Hence, the Bubble sort can be performed in $\Theta(n)$ time complexity, for best case (already sorted array).