2. Design and develop an assembly program to sort a given set of 'n' 16-bit numbers in ascending order. Adopt *Bubble Sort* algorithm to sort given elements.

```
.model small

initds macro
    mov ax,@data        ; initializing the data segment
    mov ds,ax           ; it is ds, not dx
endm ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;

.data
    array dw 20h,70h,40h,10h,50h  ; our array which has to be sorted
    count dw ($-array)/2          ; length of our array (5 elements)

.code
    initds                     ; call that macro

    mov dx, count              ; copy count to dx
    dec dx                     ; n-1 iterations

    outerloop:                 ; i loop

        mov cx,dx              ; temporary copy to cx
        lea si,array           ; first element's index to SI

        innerloop:                 ; j loop

            mov ax,[si]            ; first element to ax
            cmp ax,[si+2]          ; compare 1st and 2nd element
            jl noswap              ; if(1st < 2nd) then don't swap

            xchg [si+2],ax   }     ; else swapping is required
            mov [si],ax      }

            noswap:

                add si,02              ; point to next element
                loop innerloop         ; finish innerloop first (j)
                dec dx                 ; dec i
                jnz outerloop          ; go and finish i loop

    int 3                      ; halt or breakpoint
    align 16                   ; properly align
end
```

Count = ($ – array)/2
= (10 – 0)/2
= 5