*10. Design and develop an assembly program to drive a Stepper Motor interface and rotate the motor in specified direction (clockwise or counter-clockwise) by N steps (Direction and N are specified by the examiner). Introduce suitable delay between successive steps. (Any arbitrary value for the delay may be assumed by the student).*

```
.model small

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

init8255 macro
    mov al,cw       ; initialization of 8255 using control word
    mov dx,cr         by passing 82h to control reg.
    out dx,al         (to make port A as output)
endm

outpa macro
    mov dx,pa           ; initialization of port A as output
    out dx,al
endm

exit macro
    mov ah,4ch          ; to terminate
    int 21h
endm

;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
.data
    pa equ 1190h    ;One is Enough-setting the port address for port A
    cr equ 1193h
    cw db 82h       ; 82h is the value in control word 10000010, which
                          makes port A as output port
.code
    initds
    init8255

    mov al,88h      ; setting value in al 88=10001000
    mov bx,200
    rotate:

        outpa       ; perform rotation on port A
        call delay  ; have some delay in between the steps.
        ror al,01
        dec bx
        jnz rotate

      exit                  ; once the count becomes 0, call exit macro
```

clockwise direction- rotate right contents of al, i.e. 10001000 is rotated towards right by 1 bit. This makes the stepper motor to rotate clock wise direction. Then decrement the count and repeat the rotation process till it becomes 00 (200 times you rotate)

```
delay proc

    mov dx,00ffh
    outer:
        mov cx,0ffffh
    inner:
        loop inner
        dec dx
        jnz outer
        ret

delay endp
 end
```