LAB - 1

BINARY SEARCH

```
.MODEL SMALL
; MACRO TO DISPLAY THE MESSAGE
DISPLAY MACRO MSG
LEA DX, MSG
MOV AH, 09H
INT 21H
ENDM

.DATA
LIST DB 01H, 05H, 07H, 10H, 12H, 14H
NUMBER EQU ($-LIST) ; NUMBER HAS THE VALUE 6
KEY DB, 10H
MSG1 DB 0DH, 0AH, "ELEMENT FOUND IN THE LIST...$"
MSG2 DB 0DH, 0AH, "SEARCH FAILED! ELEMENT NOT FOUND
                   IN THE LIST $"

.CODE
START: MOV AX, @DATA
       MOV DS, AX
       MOV CH, NUMBER-1 ; HIGH VALUE
       MOV CL, 00H      ; LOW VALUE

AGAIN: MOV SI, OFFSET LIST ; LEA SI, LIST
       XOR AX, AX          ; MOV AX, 00H
       CMP CL, CH          ; SUB of CL-CH
       JE NEXT
       JNC FAILED
```

```
NEXT:   MOV  AL, CL   ; AL = 00H
        ADD  AL, CH   ; AL = 00+05 = 05
        SHR  AL, 01 H ; DIVIDE BY 2
        MOV  BL, AL   ; BL ⟶ INDEX OF MIDDLE ELE
        XOR  AH, AH   ; CLEAR AH

        MOV  BP , AX
        MOV  AL , DS : [BP][SI]
        CMP  AL , KEY ; COMPARE KEY & A[I]
        JE   SUCCESS  ; IF EQUAL, DISPLAY SUCCESS MSG
        JC   INCLOW
        MOV  CH , BL  ; if KEY > A[I] . SHIFT HIGH
        DEC  CH ; CH WILL HAVE INDEX OF
                  MID-1 ELEMENT.
        JMP  AGAIN

INCLOW : MOV  CL, BL  ; if KEY < A[I] SHIFT LOW
         INC  CL      ; CL ⟶ INDEX OF MID+1
         JMP  AGAIN                    ELEMENT

SUCCESS :  DISPLAY  MSG1
           JMP  FINAL

FAILED  :  DISPLAY  MSG2

FINAL   :  MOV  AH, 4CH
           INT  21H

END START
```