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LAB PROG - 1

MP & MC LAB

WAP to execute a Binary search in an array

```
. 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) ;(Memory address - Memory address of)
                     (  of $        starting of list      )
                     gives number of array elements

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 OR ARRAY LIMIT
          MOV  CL, 00H        ; LOW VALUE OR STARTING INDEX
                                OF THE ARRAY

AGAIN  :    MOV SI, OFFSET LIST ; STARTING ADDRESS OF LIST
                                  MOVED TO SI register

          XOR  AX, AX     ; CLEAR AX
          CMP  CL, CH     ; SUBTRACTING (CL-CH) TO CHECK IF
                            LOW VALUE IS LOW AND HIGH VALUE
                            IS HIGH

          JE  NEXT        ; IF TRUE THEN THE INSTRUCTIONS IN
                            THE LABEL NEXT IS EXECUTED

          JNC FAILED      ; IF FALSE THEN THE LABEL FAILED
                            IS EXECUTED
```

```asm
NEXT  : MOV  AL, CL
        ADD  AL, CH
        SHR  AL, 01H
        MOV  BL, AL      ; BL has index of middle element
        XOR  AH, AH      ; CLEARS AH
        MOV  BP, AX
        MOV  AL, DS: [BP][SI]
        CMP  AL, KEY     ; COMPARE KEY AND A[I].
        JE   SUCCESS     ; IF EQUAL, PRINT SUCCESS MSG
        JC   INCLOW
        MOV  CH, BL      ; IF KEY>A[I] SHIFT HIGH
        DEC  CH          ; CH has index of (middle-1) element
        JMP  AGAIN


INCLOW : MOV  CL, BL     ; IF KEY < A[I] SHIFT LOW
         INC  CL         ; CL has index of (middle+1) element
         JMP  AGAIN


SUCCESS : DISPLAY MSG1
          JMP FINAL
FAILED  : DISPLAY MSG2


FINAL   : MOV AH, 4CH
          INT 21H


END START
```