Lab Program 1

Binary Search

Name - TUSHAR PAI

USN - 1BM19CS174

```asm
.MODEL SMALL
; Macro to display 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 is having value 6.


KEY  DB  10H
MSG 1  DB. 0DH, 0AH, "Element found in the list... $"


MSG 2  DB  0DH, 0AH, "Search failed. Element not found $"


.CODE
START :  MOV, AX, @DATA
         MOV  DS, AX
         MOV  CH, NUMBER - 1    ; high value = 6-1=5
         MOV  CL, 00H           ; low value.


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

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```asm
NEXT :  MOV AL, COL   ; AL=00H.
        ADD AL, CH    ; AL=00+05=05

        SHR AL, 01H

        MOV BL, AL
        XOR AH, AH    ; Clear AH.
        MOV BP, AX
        MOV AL, DS:[BP][SI]
        CMP AL, KEY   ; Compare KEY and A[I]
        JE  SUCCESS   ; If equal, Display success message
        JC  INCLOW
        MOV CH, BL
        DEC CH.       ; CH will have index of middle -1
                          element.
        JMP AGAIN

INCLOW :  MOV CL, BL  ; If key < A[I] shift low
          INC CL      ; CL will have index of middle +1 element
          JMP AGAIN.

SUCCESS:  DISPLAY MSG1.
          JMP FINAL.

FAILED :  DISPLAY MSG2.
FINAL  :  MOV AH, 4CH
             INT 21H.
END START.
```