DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...

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C:\MASM\LAB1A.ASM

```
S; PROGRAM :: ASSEMBLY LANGUAGE PROGRAM TO SEARCH A KEY ELEMENT IN A
;             LIST OF 'n' NUMBER USING THE BINARY SEARCH ALGORITHM

.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 ($-LIST)
KEY DB 011H
MSG1 DB 0DH, 0AH, "ELEMENT FOUND IN THE LIST...$"
MSG2 DB 0DH, 0AH, "SEARCH FAILED !! ELEMENT NOT FOUND IN THE LIST $"

.CODE
START : MOV AX, @DATA
        MOV DS, AX
```

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Progra...

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C:\MASM\LAB1A.ASM

```
S_      MOV DS, AX
        MOV CH, NUMBER-1    ; HIGH VALUE...
        MOV CL, 00H         ; LOW VALUE...
AGAIN:  MOV SI, OFFSET LIST
        XOR AX, AX
        CMP CL, CH
        JE NEXT
        JNC FAILED
NEXT:   MOV AL, CL
        ADD AL, CH
        SHR AL, 01H             ; DIVIDE BY 2
        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              ; IF KEY>A[i]  SHIFT HIGH
        DEC CH
        JMP AGAIN
INCLOW: MOV CL, BL              ; IF KEY<A[i]  SHIFT LOW
```

```
S_      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                  ; IF KEY>A[i]  SHIFT HIGH
        DEC CH
        JMP AGAIN
INCLOW: MOV CL, BL                  ; IF KEY<A[i]  SHIFT LOW
        INC CL
        JMP AGAIN
SUCCESS:DISPLAY MSG1
        JMP FINAL
FAILED: DISPLAY MSG2                ; JOB OVER. TERMINATE....
FINAL : MOV AH, 4CH
        INT 21H
END START
```

Binary search:

```
;PROGRAM :: ASSEMBLY LANGUAGE PROGRAM TO SEARCH
;          A KEY ELEMENT IN THE LIST OF 'N' NUMBER
;          USING THE BINARY SEARCH ALGORITHM

.MODEL SMALL

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

.DATA
LST DB 01H, 03H, 07H, 10H, 12H, 14H
NUMBER EQU ($-LIST)
KEY DB 011H
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
       XOR AX, AX
       CMP CL, CH
       JE NEXT
```

```
        JNC FAILED
NEXT:   MOV AL,CH
        ADD AL,CH
        SHR AL,01H          ; DIVIDE BY 2
        MOV DL,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           ; IF KEY > A(i) SHIFT HIGH
        DEC CH
        JMP AGAIN
INCLOW: MOV CL,DL           ; IF KEY < A(i) SHIFT LOW
        MOV DL,AL
        XOR AH,AH           ; CLEAR AH
        MOV BP,AX
        MOV AL,DS:[BP][SI]
        CMP AL,KEY          ; COMPARE KEY AND A(i)
        JE SUCCESS
        JC INCLOW
        MOV CH,BL
INCCL:  DEC CH
        JMP AGAIN
SUCCESS: DISPLAY MSG1
        JMP FINAL
FAILED: DISPLAY MSG2        ; JOB ONE : TERMINATE
FINAL:  MOV AH,4CH
        INT 21H
END START
```