

EXPERIMENT NO: 01

ROLL No:

NAME:

TITLE: Interfacing of seven segment display with 8051 microcontroller.

Theory:

Common Cathode (CC) 7 Segment Display:

Even though the internal structure of both common anode and cathode appears the same, as the name suggests, in common cathode seven segment display one side, i.e., the cathode part of all the eight light-emitting diodes is shorted together and connected to the ground/GND. The other side i.e., the anode part, is connected to the microcontroller I/O pins. When we give a high pulse through the pins of the microcontroller, the LED turns ON. Hence, we can say that a common cathode type display is active HIGH.

Code for 8051:

ORG 4000H

DB 3FH, 06H, 5BH, 4FH, 66H, 6DH, 7DH, 07H, 7FH, 6FH, 0

; Lookup table for digits 0 to 9

ORG 0000H

main: MOV DPTR, #4000H

repeat: CLR A

MOVC A, @A+DPTR ; Copy data from external location to accumulator

MOV P2, A ; Move the pattern of the digit into port P2

ACALL delay ; Call a delay to so that the transition is visible

INC DPTR ; Point to the next pattern

CJNE A, 0, repeat ; Repeat till 0 (Stop bit) is received

SJMP main ; Run this forever till externally stopped

; generate a decent enough delay between transitions

delay:

MOV R0, #08H

LP2: MOV R1, #0FFH

LP1: MOV R2, #0FFH

LP3: DJNZ R2, LP3

DJNZ R1, LP1

DJNZ R0, LP2

RET

END

The screenshot displays the Keil uVision IDE with the assembly view of the file 7seg.asm. The assembly code is as follows:

```

1 ORG 4000H
2 DB 3FH, 06H, 5BH, 4FH, 66H, 6DH, 7DH, 07H, 7FH, 6FH, 0
3 ; Lookup table for digits 0 to 9
4
5 ORG 0000H
6 main: MOV DPTR, #4000H
7 repeat: CLR A
8         MOV A, @A+DPTR      ; Copy data from external location to
9         MOV P2, A           ; Move the pattern of the digit into
10        ACALL delay         ; Call a delay to so that the transition is visible
11        INC DPTR            ; Point to the next pattern
12        CJNE A, 0, repeat    ; Repeat till 0 (Stop bit) is received
13        SJMP main           ; Run this forever till externally stopped
14
15 ; generate a decent enough delay between transitions
16 delay: MOV R0, #08H
17 LP2:   MOV R1, #0FFH
18 LP1:   MOV R2, #0FFH
19 LP3:   DJNZ R2, LP3
20        DJNZ R1, LP1
21        DJNZ R0, LP2

```

The registers window on the left shows the current register values, and the Parallel Port 2 window on the right shows the current port value as 0x0D.

