23VLSI1401: Microcontroller & Computer Architecture (U6L2)

8051 Microcontroller Interfacing and programming for 7 segment display

(QA Based Learning)

A presentation by

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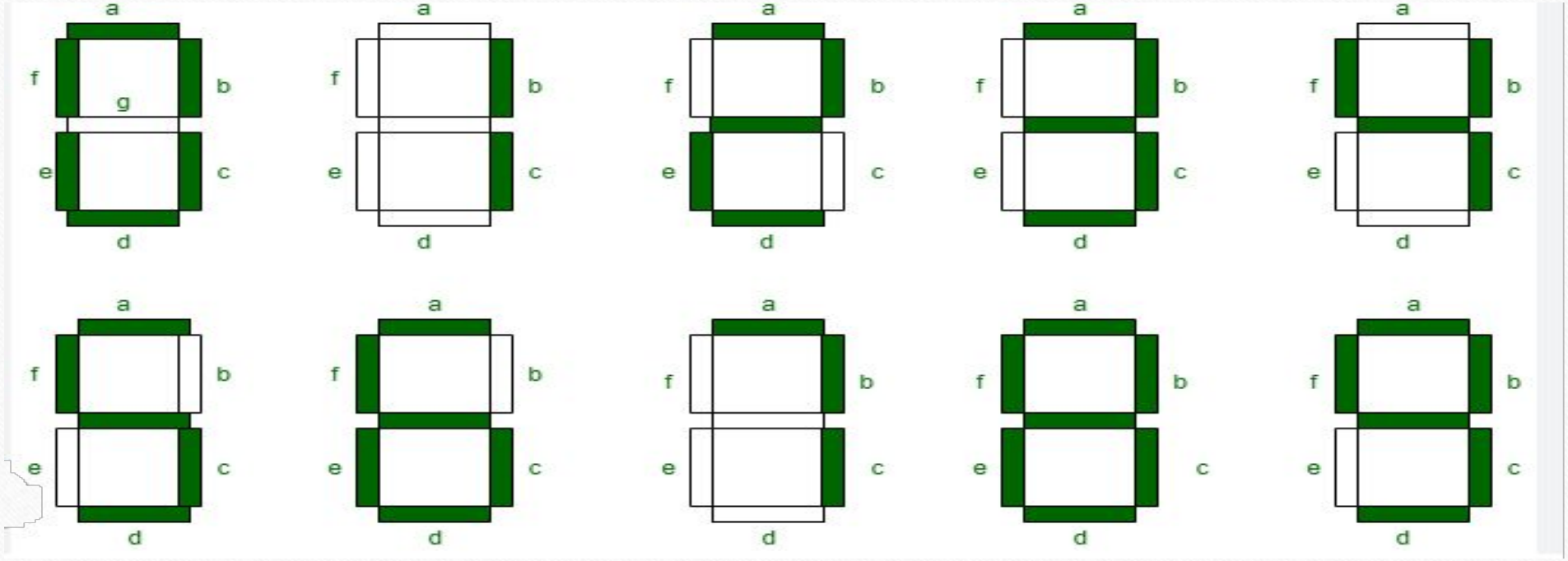
Session objectives and Expected Session Outcomes

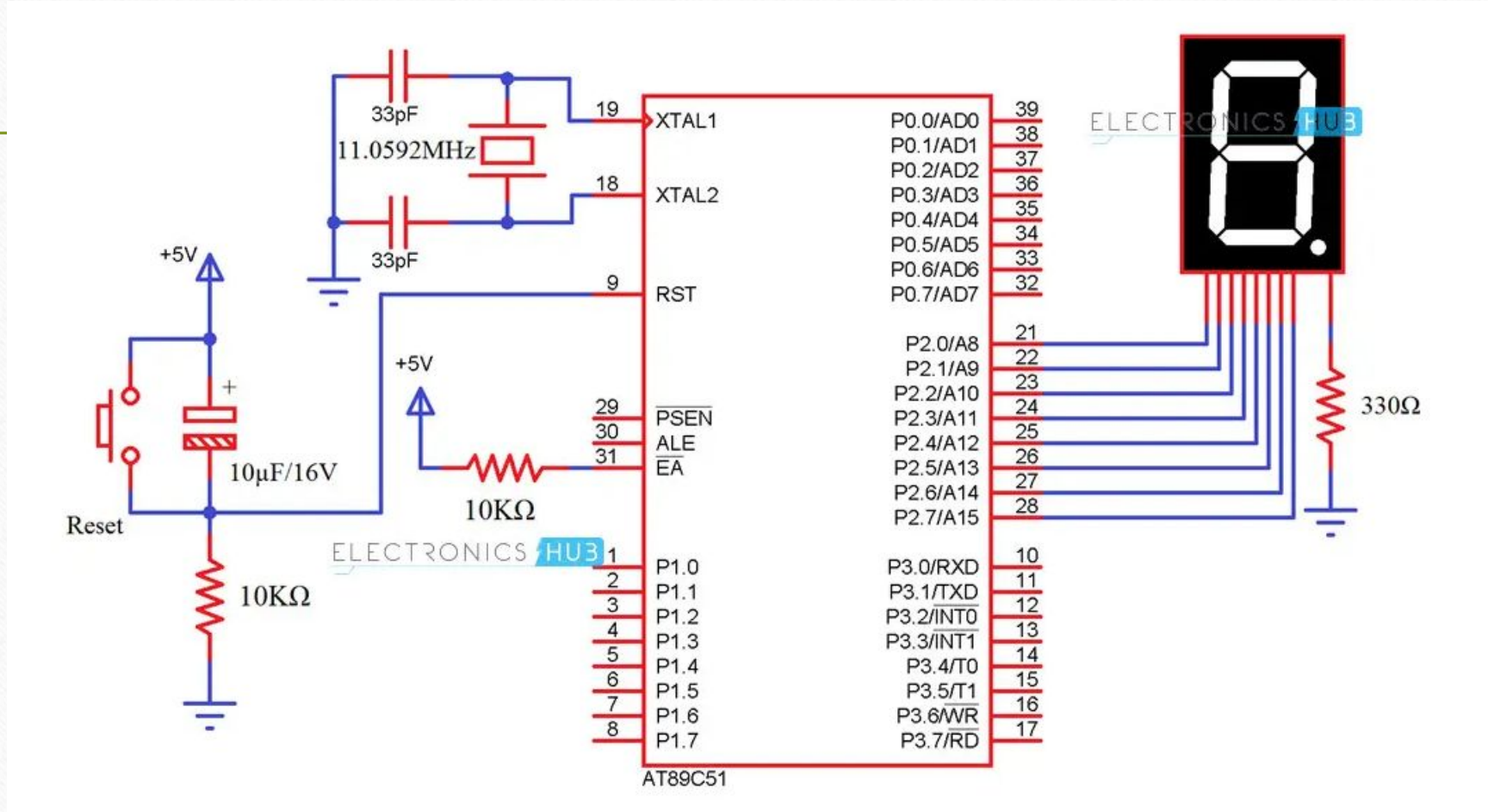
- **Session Objective:** To envisage the concept of Interfacing and programming for LCD with 8051 Microcontroller, through the innovative practice in T/L named "QA based learning"
- **Session Outcomes:** At the end of this session, the students will learn

- 7-segment Display
- Address Decoding table for BCD to 7 segment code
- Interfacing of 7-segment LCD display with 8051
- Programming examples

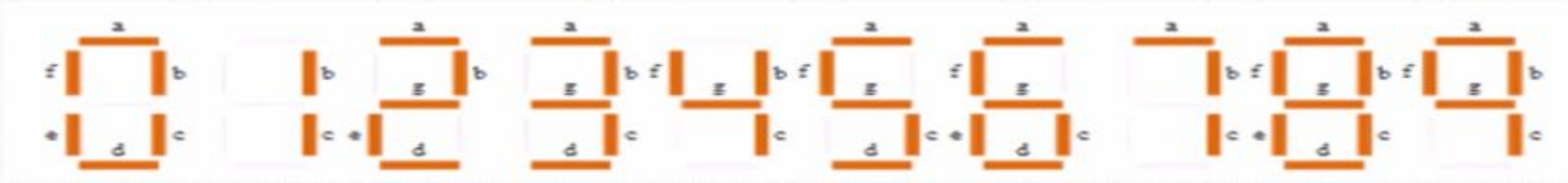
Q.1: Develop 7-segment display for the numerics 0-9

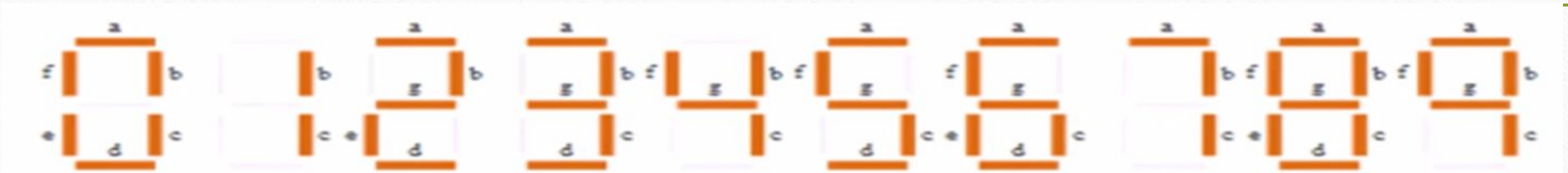


Q.2: Draw the interfacing diagram for interfacing 7-segment LED at port 2

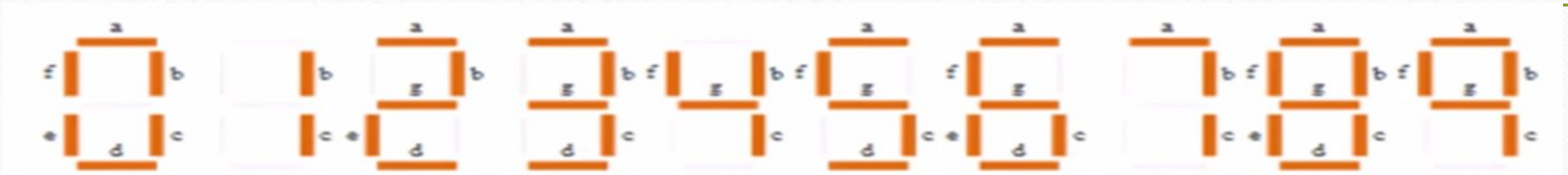


Q.3 Interface a 7-segment LCD display with 8051 through Port 2. Connect the diodes in Common Anode Configuration. Develop a table for obtaining the codes for the digits 0-9. Also draw the interfacing diagram.

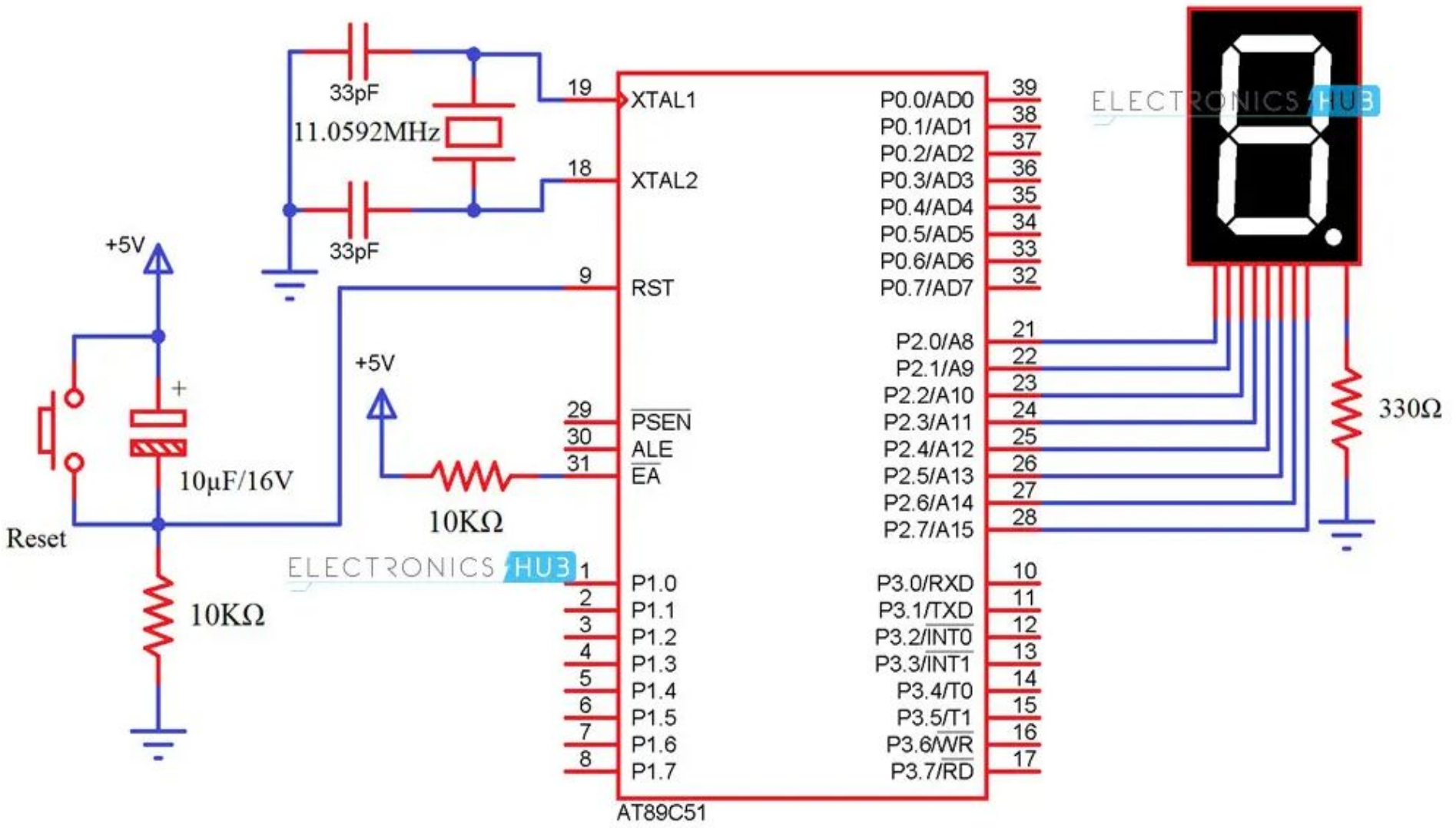




Digit	h	g	f	e	d	c	b	a	Code
0									
1									
2									
3									
4									
5									
6									
7									
8									
9									



Digit	h	g	f	e	d	c	b	a	Code
0	1	1	0	0	0	0	0	0	C0
1	1	1	1	1	1	0	0	1	F9
2	1	0	1	0	0	1	0	0	A4
3	1	0	1	1	0	0	0	0	B0
4	1	0	0	1	1	0	0	1	99
5	1	0	0	1	0	0	1	0	92
6	1	0	0	0	0	0	1	0	82
7	1	1	1	1	1	0	0	0	F8
8	1	0	0	0	0	0	0	0	80
9	1	0	0	1	1	0	0	0	98

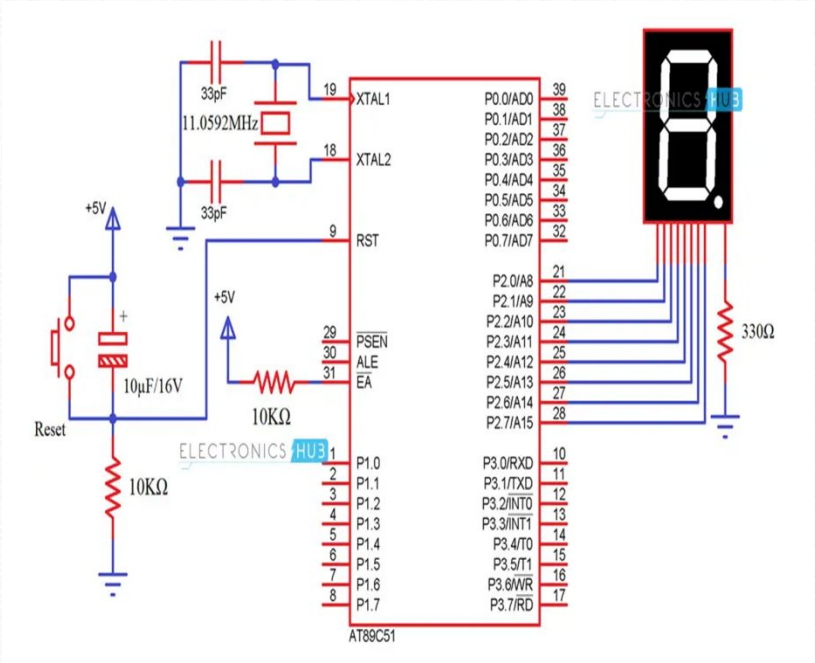

33pF
11.0592MHz
33pF
19
XTAL1
18
XTAL2
9
RST
29
PSEN
30
ALE
31
EA
1
P1.0
2
P1.1
3
P1.2
4
P1.3
5
P1.4
6
P1.5
7
P1.6
8
P1.7
AT89C51
P0.0/AD0
P0.1/AD1
P0.2/AD2
P0.3/AD3
P0.4/AD4
P0.5/AD5
P0.6/AD6
P0.7/AD7
P2.0/A8
P2.1/A9
P2.2/A10
P2.3/A11
P2.4/A12
P2.5/A13
P2.6/A14
P2.7/A15
P3.0/RXD
P3.1/TXD
P3.2/INT0
P3.3/INT1
P3.4/T0
P3.5/T1
P3.6/WR
P3.7/RD
39
38
37
36
35
34
33
32
21
22
23
24
25
26
27
28
10
11
12
13
14
15
16
17
+5V
+5V
10µF/16V
Reset
10KΩ
10KΩ
330Ω
ELECTRONICS HUB
ELECTRONICS HUB

Code memory Read only Data moves

Mnemonic	Operation
MOVC A,@A+DPTR	Copy the code byte, found at the ROM address formed by adding A and the DPTR, to A
MOVC A,@A+PC	Copy the code byte, found at the ROM address formed by adding A and the PC, to A

Programming Example

Q.4: Write a program to display the digits from 0-5 continuously on 7-segment display if the LEDs are connected in Common Anode configuration and display unit is interfaced with 8051 at Port 2



Memory address7	Data
6000	C0
6001	F9
6002	A4
6003	B0
6004	99
6005	92
6006	82
6007	F8
6008	80
6009	98

```
        ORG 0000H
L1:  MOV R0,#06H
     MOV DPTR,#STRING
L2:  MOV A,#00H
     MOVC A,@A+DPTR
     MOV P1,A
     ACALL DELAY
     INC DPTR
     DJNZ R0, L2
SJMP L1
```

STRING: DB CO, F9, A4, B0, 99, 92


Thank
you