

COAL_A_p200165_R13_14

Introduction:

In Lab No 13 and 14 we have done similar kind of work as we have done in Lab No 11 and 12. In lab no 11,12 we have done that on simulator but in lab 13,14 we have done that on physical hardware.

First of all what we have done is created hex file of our code that we have written in our lab 11 and 12 and then we have burned that code into Atmega328p chip.

Once that done we have connected with the hardware and connected output pins (Pb0 to Pb7) our eight output pins to 7 segment display and provided Ground and 5voltage to the chip.

Then we have Switched On the circuit the problem we faced is that we have connected common anode with the output pins but we have written code keeping in mind common cathode so what we have done we have changed our 7segment from common anode to common cathode and after that this worked fine and we are able to see digits displaying from 0 to 9 on 7 segment display.

```
1 .INCLUDE "M328pDEF.INC"
2 .ORG 0
3
4         LDI R16, HIGH (RAMEND)
5         OUT SPH, R16
6         LDI R16, LOW (RAMEND)
7         OUT SPL, R16
8
9         LDI R19, 0xFF
10        OUT DDRB, R19
11 START:
12        LDI R20, 0x7E
13        OUT PORTB, R20
14        RCALL DELAY
15
16        LDI R21, 0x30
17        OUT PORTB, R21
18        RCALL DELAY
19
20        LDI R22, 0x6D
21        OUT PORTB, R22
22        RCALL DELAY
23
24        LDI R23, 0x79
25        OUT PORTB, R23
26        RCALL DELAY
27
28        LDI R24, 0x33
29        OUT PORTB, R24
30        RCALL DELAY
31
32        LDI R25, 0x5B
33        OUT PORTB, R25
34        RCALL DELAY
35
36        LDI R25, 0x5B
37        OUT PORTB, R25
38        RCALL DELAY
39
40        LDI R26, 0x5F
41        OUT PORTB, R26
42        RCALL DELAY
43
44        LDI R27, 0x70
45        OUT PORTB, R27
46        RCALL DELAY
47
48        LDI R28, 0x7F
49        OUT PORTB, R28
50        RCALL DELAY
51
52        LDI R30, 0x7B
53        OUT PORTB, R30
54        RCALL DELAY
55
56        JMP START
57
58 DELAY:
59        LDI R16, 0xFF
60        LDI R17, 0xFF
61        LDI R18, 0x5
62        DEC R18
63        BRNE AGAIN1
64        DEC R17
65        BRNE AGAIN2
66        DEC R16
67        BRNE AGAIN3
68        RET
```

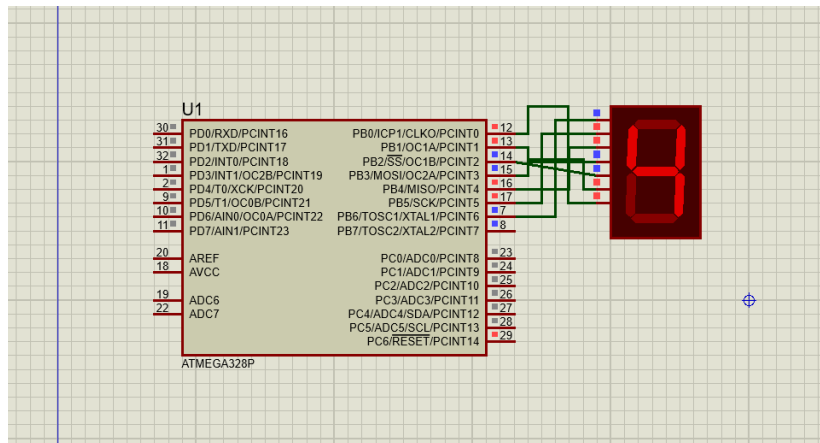
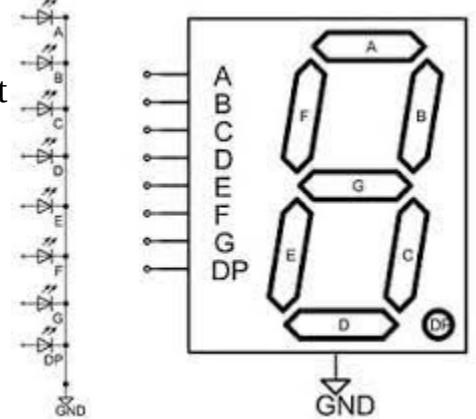
First of all we included the Library for which we are going to code. Like in our case we are going to code for ATMEGA328P so we included M328pDEF.Inc Library. Then we have instruction that is “LDI” that means **Load data in** and it takes two operands. We gave loaded HIGH ramend in R16 and then putted that value in SPH stack pointer high after that we have loaded LOW ramend in R19 and moved that to SPL stack pointer.

Then our program starts, So first of all what Is over logic? We are going to produce 0 to 9 counting on the 7 segment display. Here is the 7 segment display.

Diagram shows that If we want to display 0 then we have to provide 0 voltage to G LED and others A, B, C, D, E, F will be provided high voltage then zero will be displayed on 7 segment display.

Same if we want to display 1 then we have to on LED B and C and others will be provided 0 voltage.

Also I have given DDRB high voltage(ff) that mean this port will be treated as output port. Now all PB0 to PB7 all pins will be treated as output pins they will produce output.



Same kind of circuit we have made physically and same in this manner this is displaying the output.

Name : Jawad Ahmed
RollNO: 20P-0165
Section : 3A