# 7447 through AVR-Assembly

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Contents



***Abstract*—This manual shows how to program the 7447 BCD-Seven segment display decoder through AVR-Assembly.**

## 1 Components

| Component | Value | Quantity |
|---|---|---|
| Resistor | 220 Ohm | 1 |
| Arduino | UNO | 1 |
| Seven Segment Display | | 1 |
| Decoder | 7447 | 1 |
| Jumper Wires | M-M | 20 |
| Breadboard | | 1 |

## 2 Controlling the Display

1. Connect the 7447 IC to the seven segment display.
2. Make connections between the 7447 and the arduino according to Table 2

| **7447** | D | C | B | A |
|---|---|---|---|---|
| **Arduino** | 5 | 4 | 3 | 2 |

TABLE 2

3. Execute the following program. The number 5 will be displayed.

```
wget https://raw.githubusercontent.com/gadepall
    /arduino/master/assembly/7447/io/codes/
    op_7447.asm
```

4. Now generate the numbers 0-9 by modifying the above program.
5. Execute the following program after making the connections in Table 5. The number 3 will be displayed. What does the program do?

```
wget https://raw.githubusercontent.com/gadepall
    /arduino/master/assembly/7447/io/codes/
    ip_7447.asm
```

| | Z | Y | X | W |
|---|---|---|---|---|
| **Input** | 0 | 0 | 1 | 1 |
| **Arduino** | 13 | 12 | 11 | 10 |

TABLE 5

**Solution:** The program reads from pins 10-13 and displays the equivalent decimal value on the display by writing to pins 2-5 of the arduino.

6. Explain the following instructions

```
ldi r17, 0b11000011 ; identifying input
    pins 10,11,12,13
ldi r17, 0b11111111 ;
out PORTB,r17  ;
in r17,PINB
```

**Solution:** First define pins 10,11,12 and 13 as input pins. Then ensure that these pins have the input 1 by default. Load the inputs from the pins in port B (which includes pins 10-13) into R17.

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