Seven Segment Display through Arduino

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Contents

***Abstract*—The objective of this manual is to show how to control a seven segment display through the arduino IDE.**

1 Components

Component	Value	Quantity
Breadboard		1
Resistor	$\geq 220\Omega$	1
Arduino	Uno	1
Seven Segment Display	Common Anode	1
Jumper Wires		20

TABLE 1.0

1.1 Breadboard

The breadboard can be divided into 5 segments. In each of the green segements, the pins are internally connected so as to have the same voltage. Similarly, in the central segments, the pins in each column are internally connected in the same fashion as the blue columns.

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1.2 Seven Segment Display

The seven segment display in Fig. 2.2 has eight pins, a, b, c, d, e, f, g and *dot* that take an active LOW input, i.e. the LED will glow only if the input is connected to ground. Each of these pins is connected to an LED segment. The *dot* pin is reserved for the · LED.

1.3 Arduino

The Arduino Uno has some ground pins, analog input pins A0-A3 and digital pins D1-D13 that can be used for both input as well as output. It also has two power pins that can generate $3.3V$ and $5V$. In the following exercises, only the GND, $5V$ and digital pins will be used.

2 Display Control through Hardware

2.1 Powering the Display

Problem 2.1. Plug the display to the breadboard in Fig. 2.1 and make the connections in Table 2.1. Henceforth, all 5V and GND connections will be made from the breadboard.

Arduino	Breadboard
5V	Top Green
GND	Bottom Green

TABLE 2.1

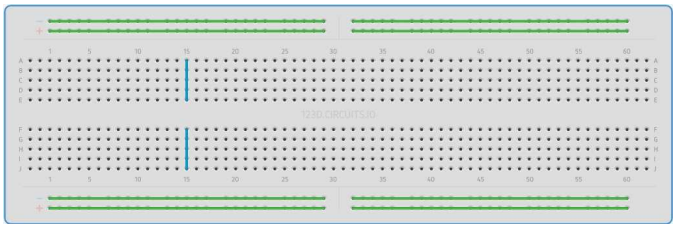

Fig. 2.1

Problem 2.2. Make the connections in Table 2.2.

Breadboard		**Display**
5V	Resistor	COM
GND		DOT

TABLE 2.2

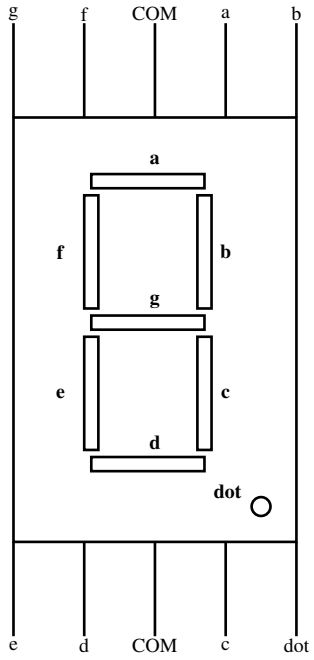

Fig. 2.2

Problem 2.3. Connect the Arduino to the computer. The DOT led should glow.

2.2 Controlling the Display

Fig. 2.6 explains how to get decimal digits using the seven segment display. GND=0.

Problem 2.4. Generate the number 1 on the display by connecting only the pins *b* and *c* to GND (=0). This corresponds to the first row of 2.6. 1 means not connecting to GND.

Problem 2.5. Repeat the above exercise to generate the number 2 on the display.

Problem 2.6. Draw the numbers 0-9 as in Fig. 2.6 and complete Table 2.6

a	b	c	d	e	f	g	decimal
1	0	0	1	1	1	1	1
0	0	1	0	0	1	0	2

TABLE 2.6

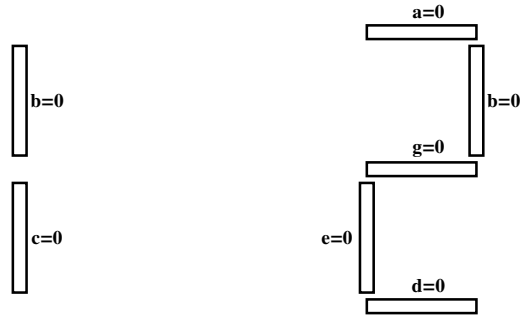

Fig. 2.6

3 Display Control through Software

Problem 3.1. Make connections according to Table **??**

Problem 3.2. Execute the following code using the arduino IDE

Problem 3.3. Now generate the numbers 0-9 by modifying the above program.

Arduino	2	3	4	5	6	7	8
Display	a	b	c	d	e	f	g

TABLE 3.1