Display control through ESP32 using Arduino Framework

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Contents

Abstract—This document shows how to implement a decade counter using the Arduino framework on ESP32.

1 Software

All codes used in this document are available at the following link

https://github.com/gadepall/ugv/tree/main/codes/sevenseg

2 Setup

2.1. Fig.2.1.3 shows all the pins of the ESP32. Connect the pins of the display in Fig. 2.1.1 to the ESP32 using Table 2.1.1. The COM pin should be connected to 3.3V through a resistor.

Display	ESP32
a	32
b	33
c	25
d	26
e	27
f	14
g	12
COM	3.3 V

TABLE 2.1.1: Display-ESP32 connection.

2.2. Now execute the following code using platformio

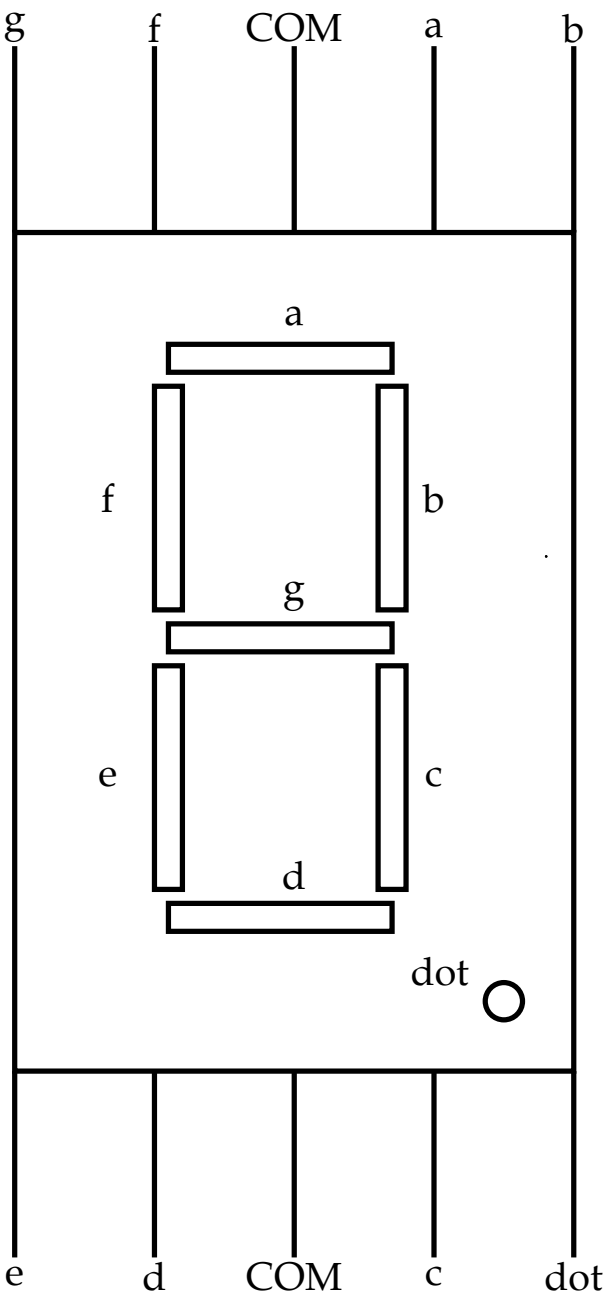

Fig. 2.1.1: Seven Segment Display

codes/sevenseg/src/main.cpp

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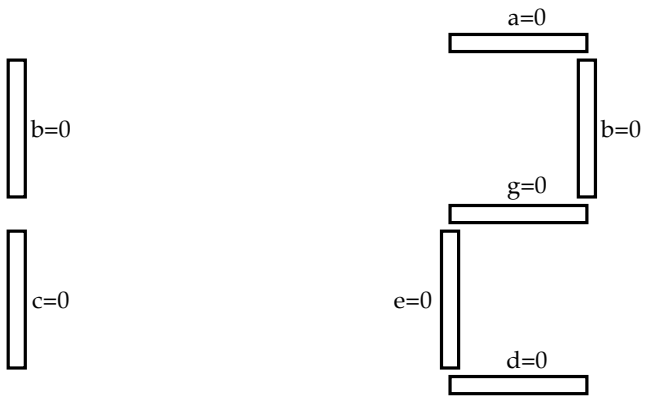

Fig. 2.1.2: Pictorial representation of Table 2.3.1.

Flash firmware.bin obtained upon execution of the above code to the ESP32. You should see the number 9 on the display. The following function generates this number.

```
sevenseg(0,0,0,0,1,0,0);
void sevenseg(int a,int b,int c
   ,int d,int e,int f,int g)
{
  digitalWrite(32, a);
  digitalWrite(33, b);
  digitalWrite(25, c);
  digitalWrite(26, d);
  digitalWrite(27, e);
  digitalWrite(14, f);
  digitalWrite(12, g);
}
```

2.3. Modify the above program using Table 2.3.1 and Fig. 2.1.2 to display 0-9.

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 2.3.1: Decimal number generation on the display.

3 Examples

3.1. Use a function taking binary input in the code in 2.2 to generate numbers on the display.
Solution: Execute the following file.

```
codes/input/src/main.cpp
```

3.2. Program the ESP32 to function as a decade counter.

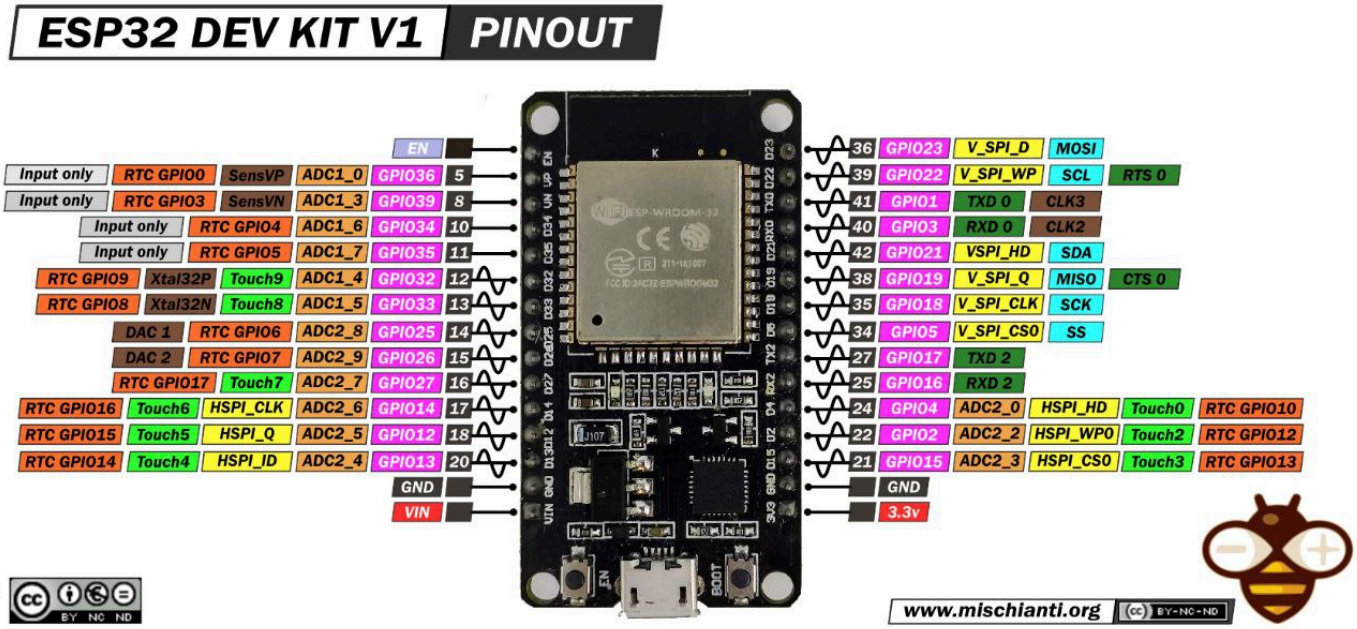

Fig. 2.1.3: Pin Diagram. Note that the pin diagram may vary depending upon the ESP32 variant.