Counting time in 0.5 sec intervals

# Lab task

Count time in 500 millisecond intervals.

# Hardware

IoT homelab kit: ESP and OLED display

# Software

1. *// main.cpp*
2. #include <Arduino.h>
3. #include <Ticker.h>
4. #include <ESP8266WiFi.h>
5. #include <Adafruit\_I2CDevice.h>
6. #include <Adafruit\_GFX.h>
7. #include <Adafruit\_SSD1306.h>
9. #define OLED\_RESET 0 *// GPIO0*
11. Adafruit\_SSD1306 display(OLED\_RESET); *// Create an object for OLED screen*
13. int i = 0; *// Counter variable is defined*
15. *// ITT splashs screen bitmap. Generator can be found in: http://javl.github.io/image2cpp/*
16. static const unsigned char PROGMEM logo16\_glcd\_bmp[] =
17. {
18. 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
19. 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
20. 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
21. 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x7f, 0xff, 0xff, 0xff,
22. 0x00, 0x00, 0x00, 0x03, 0xff, 0xff, 0xff, 0xff, 0x00, 0x00, 0x00, 0x0f, 0xff, 0xff, 0xff, 0xff,
23. 0x00, 0x00, 0x00, 0x1f, 0xff, 0xff, 0xff, 0xff, 0x00, 0x00, 0x00, 0x3f, 0xc0, 0x00, 0x00, 0x00,
24. 0x00, 0x00, 0x00, 0x7e, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x7c, 0x00, 0x00, 0x00, 0x00,
25. 0x00, 0x00, 0x00, 0xf8, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x70, 0xf8, 0x38, 0x00, 0x00, 0x00,
26. 0x00, 0x00, 0x78, 0xf0, 0x78, 0x00, 0x00, 0x00, 0x00, 0x00, 0x78, 0xf0, 0x78, 0x00, 0x00, 0x00,
27. 0x00, 0x00, 0x70, 0xf0, 0x38, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0xf0, 0x00, 0x00, 0x00, 0x00,
28. 0x00, 0x00, 0x78, 0xf0, 0x7c, 0x1e, 0x0f, 0x00, 0x00, 0x00, 0x78, 0xf0, 0x7c, 0x3e, 0x3f, 0xc0,
29. 0x00, 0x00, 0x78, 0xf8, 0x7c, 0x7e, 0x7f, 0xe0, 0x00, 0x00, 0x78, 0x78, 0x7c, 0x7e, 0xff, 0xf0,
30. 0x00, 0x00, 0x78, 0x78, 0x7c, 0xfe, 0xf9, 0xf0, 0x00, 0x00, 0x78, 0x7c, 0x7c, 0xf8, 0xf0, 0xf0,
31. 0x00, 0x00, 0x78, 0x3c, 0x7c, 0xf8, 0xf0, 0xf0, 0x00, 0x00, 0x78, 0x3c, 0x7c, 0xf8, 0xf9, 0xf0,
32. 0x00, 0x00, 0x78, 0x3c, 0x7c, 0xf8, 0xff, 0xf0, 0x00, 0x00, 0x78, 0x3c, 0x7c, 0xf8, 0x7f, 0xe0,
33. 0x00, 0x00, 0x78, 0x3c, 0x7c, 0xf8, 0x7f, 0xe0, 0x00, 0x00, 0x78, 0x3c, 0x7c, 0xf8, 0x3f, 0xc0,
34. 0x00, 0x00, 0x00, 0x7c, 0x00, 0x00, 0x06, 0x00, 0x00, 0x00, 0x00, 0x78, 0x00, 0x00, 0x00, 0x00,
35. 0x00, 0x00, 0x01, 0xf8, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x07, 0xf0, 0x00, 0x00, 0x00, 0x00,
36. 0xff, 0xff, 0xff, 0xe0, 0x41, 0x02, 0x08, 0x00, 0xff, 0xff, 0xff, 0xc0, 0x5f, 0xaf, 0x1e, 0x80,
37. 0xff, 0xff, 0xff, 0x80, 0x52, 0x0a, 0xbb, 0x00, 0xff, 0xff, 0xfc, 0x00, 0x00, 0x00, 0x20, 0x00,
38. 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
39. 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
40. 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
41. 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00
42. };
43. unsigned long tim;
44. unsigned long lasttime;
45. void setup()
46. {
47. *// Initialize serial port and send message*
48. Serial.begin(115200); *// setting up serial connection parameter*
49. Serial.println("Booting");
50. *// initialize with the I2C addr 0x3C (for the 64x48)*
51. display.begin(SSD1306\_SWITCHCAPVCC, 0x3C);
53. *// Since the buffer is initialized with an Adafruit splashscreen*
54. *// internally, we should clear it*
55. display.clearDisplay();
57. *// Load ITT splash screen into buffer*
58. display.drawBitmap(0, 0, logo16\_glcd\_bmp, 64, 48, 1);
59. *// Show image buffer on the display*
60. display.display();
62. *// Display splashscreen two second*
63. delay(2000);
64. tim = millis();
65. lasttime = tim;
66. }
68. void loop()
69. {
70. *// Print the time*
71. tim = millis();
72. if (tim - lasttime > 500) {
73. i++;
74. lasttime = tim;
75. *// Display counter value on the OLED screen*
76. display.clearDisplay(); *// clears the srceen*
77. display.setTextSize(1); *// sets the text size for the screen*
78. display.setTextColor(WHITE); *// text color is set to white*
79. display.setCursor(0,0); *// position from where the text writing is starting*
80. display.println("TIM: "); *// a text is send to the screen*
81. display.println(i \* 0.5); *// counter value is send to the screen*
82. display.display(); *// show image*
83. }
84. }
85. *; platformio.ini*
86. [env:d1\_mini]
87. platform = espressif8266
88. board = d1\_mini
89. framework = arduino
90. monitor\_speed = 115200
91. monitor\_port = /dev/cu.usbserial-130
92. upload\_speed = 115200
93. lib\_deps = ITTIoT, Adafruit GFX Library, Adafruit SSD1306 Wemos Mini OLED, adafruit/Adafruit BusIO

# Conclusions

Counts time as expected and display on the screen.

# References

<https://robolabor.ee/homelab/en/iot/examples/oled>

<http://javl.github.io/image2cpp/>