National Textile University, Faisalabad

Department of Computer Science

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Registration No:	23-NTU-CS-1074
Lab Report:	EMBEDDED IOT
Course Code:	IOT
Course Name:	EMBEDDED IOT
Submitted To:	SIR NASIR
Submission Date:	22-09-2024

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▯ Project Examples

Core `6.1.18` · Home `3.4.4`

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IoT for Beginners

PlatformIO Labs · 3h
Microsoft leverages PlatformIO for its
course "IoT for Beginners" 🌱
A free, open-source, 12-week/24-lesson
#IoT curriculum designed for beginners
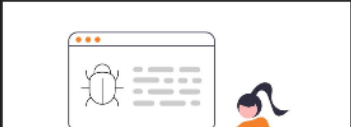
struct (x86-64)
char a | padding (3 bytes) | int b (4 bytes)
double c (8 bytes)
char d[10] (10 bytes) ...
d (continued) | padding (6 bytes)

PlatformIO Labs · 4d
#LearnEmbedded 🌱 "Structures in C:
From Basics to Memory Alignment" by
Andreas Heck
Discover the power of structures in C:

PlatformIO Labs · 1w
#BestPractices 🔥 "Enhancing Code
Quality with PlatformIO, SonarCloud and
GitHub Actions" by Pascal Roobrouck
👉 https://lnkd.in/dxxADMBT

Recent Projects

PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   PORTS

▷ powershell

```
PS C:\TALAL EMBEDDED IOT\ESP32.BLINK>
```

platformio.ini

```ini
; PlatformIO Project Configuration File
;
;   Build options: build flags, source filter
;   Upload options: custom upload port, speed and extra flags
;   Library options: dependencies, extra library storages
;   Advanced options: extra scripting
;
; Please visit documentation for the other options and examples
; https://docs.platformio.org/page/projectconf.html

[env:esp32dev]
platform = espressif32
board = esp32dev
framework = arduino
monitor_speed = 115200
```
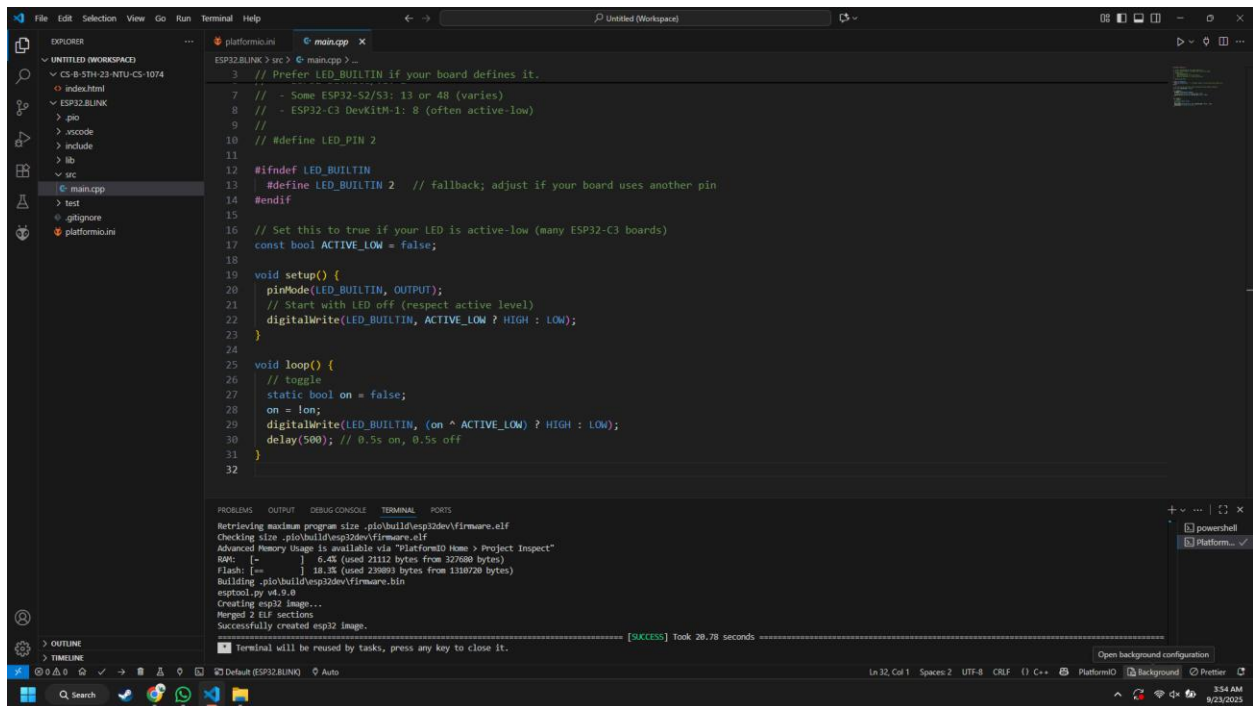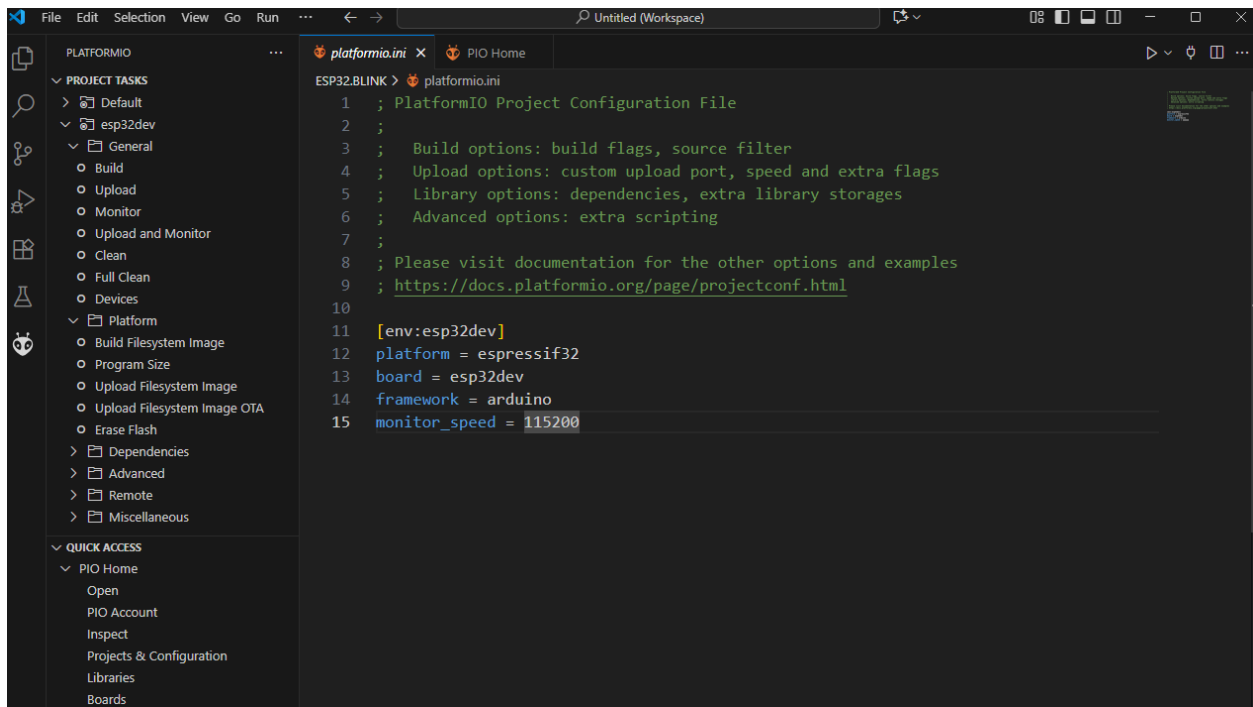
main.cpp

```cpp
// Prefer LED_BUILTIN if your board defines it.
//  - Some ESP32-S2/S3: 13 or 48 (varies)
//  - ESP32-C3 DevKitM-1: 8 (often active-low)
//
// #define LED_PIN 2

#ifndef LED_BUILTIN
  #define LED_BUILTIN 2   // fallback; adjust if your board uses another pin
#endif

// Set this to true if your LED is active-low (many ESP32-C3 boards)
const bool ACTIVE_LOW = false;

void setup() {
  pinMode(LED_BUILTIN, OUTPUT);
  // Start with LED off (respect active level)
  digitalWrite(LED_BUILTIN, ACTIVE_LOW ? HIGH : LOW);
}

void loop() {
  // toggle
  static bool on = false;
  on = !on;
  digitalWrite(LED_BUILTIN, (on ^ ACTIVE_LOW) ? HIGH : LOW);
  delay(500); // 0.5s on, 0.5s off
}
```

Terminal output:

```
Retrieving maximum program size .pio\build\esp32dev\firmware.elf
Checking size .pio\build\esp32dev\firmware.elf
Advanced Memory Usage is available via "PlatformIO Home > Project Inspect"
RAM:   [=         ]   6.4% (used 21112 bytes from 327680 bytes)
Flash: [==        ]  18.3% (used 239893 bytes from 1310720 bytes)
Building .pio\build\esp32dev\firmware.bin
esptool.py v4.9.0
Creating esp32 image...
Merged 2 ELF sections
Successfully created esp32 image.
======================= [SUCCESS] Took 20.78 seconds =======================

* Terminal will be reused by tasks, press any key to close it.
```

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Retrieving maximum program size .pio\build\esp32dev\firmware.elf
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====================================================== [SUCCESS] Took 20.78 seconds ======================================================

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```