Introduction to Arduino IDE and getting started with the ESP32 microcontroller

Part 2: Developing Arduino sketches with multiple files

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Introduction

- Developing Arduino sketches with multiple files:

    1. The basics of an Arduino sketch.

    2. Folder and file structure.

    3. Managing a project: folders and files. Importance of commenting and formatting code.

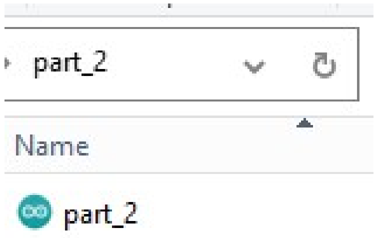
    4. Walkthrough example: developing an Arduino sketch with multiple files.

Single file Arduino Sketch

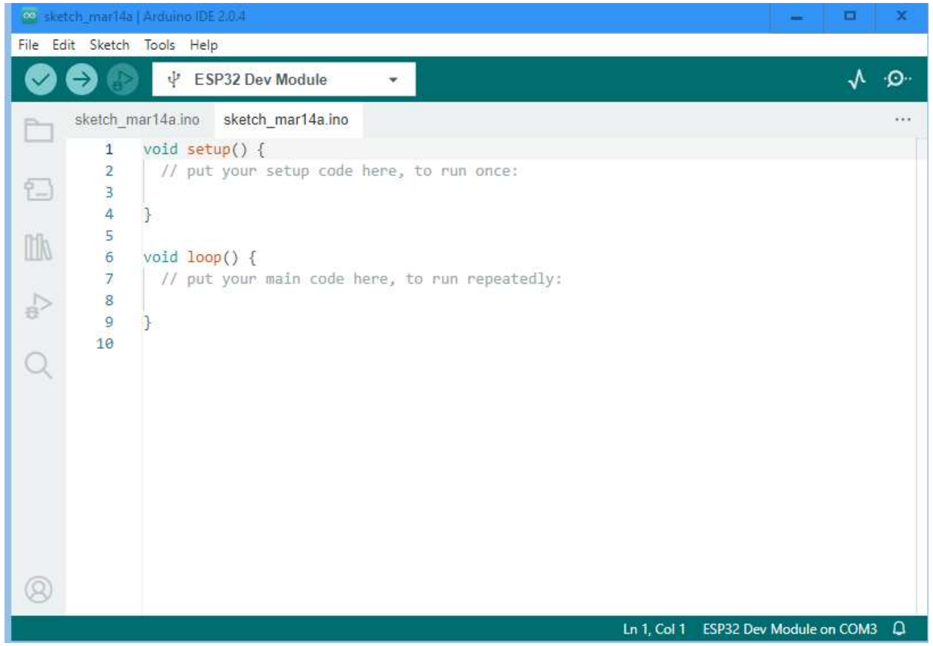
- When a new Arduino Sketch is created, it is a folder containing a single .ino file.

- The Sketch should be saved to a suitable folder on the user's computer.

- For smaller coding projects, a single .ino file containing all code would be OK as the single file would not become too large and complicated to develop and manage.



- For larger coding projects, the code should be separated into linked smaller .ino files.


sketch_mar14a | Arduino IDE 2.0.4
File Edit Sketch Tools Help
ESP32 Dev Module
sketch_mar14a.ino
sketch_mar14a.ino

```
void setup() {
  // put your setup code here, to run once:

}

void loop() {
  // put your main code here, to run repeatedly:

}

```

Ln 1, Col 1   ESP32 Dev Module on COM3

Commenting:

//	Single line comment (C++ style)
/* … */	Multi-line comment (C style)

More complex sketches will require multiple files

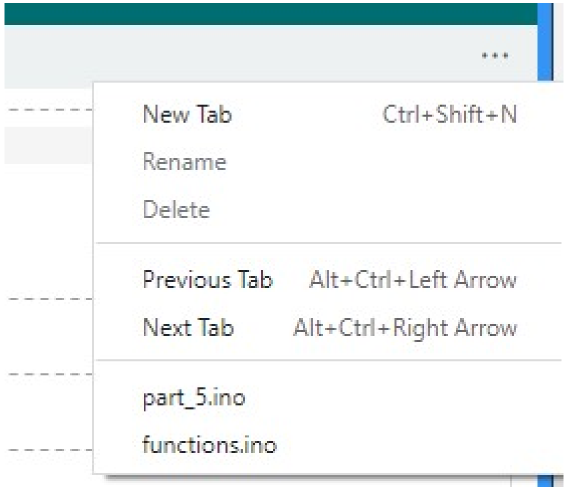
- For larger coding projects, the code should be separated into linked smaller .ino files.

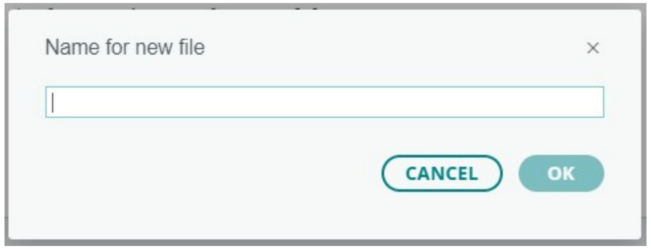
- The benefits for this approach include:

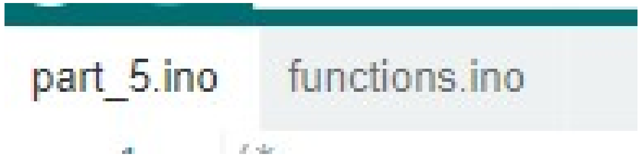
    - The overall coding project is easier to manage and supports modularisation of the code.
    - Supports code re-use in different coding project.
    - Easier to understand the code operation.
    - Supports documentation of the code.
    - Easier to create and debug the code.

Creating additional .ino files

- To create an additional .ino file, select the three dots (top right of the window), and select New Tab.
- In the pop-up window that appears, type in a suitable file name and press OK.
- The new file appears as a new tab and can be edited. When the top level .ino file is compiled (the top level .ino file has the same name as the Sketch), the other .ino files are automatically available.
- For more advanced projects, compare this approach to standard C/C++ coding approaches.


...
New Tab Ctrl+Shift+N
Rename
Delete
Previous Tab Alt+Ctrl+Left Arrow
Next Tab Alt+Ctrl+Right Arrow
part_5.ino
functions.ino





Uses

- Use additional .ino files to make the coding project more manageable and understandable:

1. Create multiple, smaller files.
2. Use additional .ino files for functions that are called from other .ino files.
3. Group functions together that should be together (e.g., serial port functions).
4. Create a new file that acts as a README file for documentation purposes.

Any questions?

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