Pervasive Computing

COMP5047 – Tutorial 01

The School of Computer Science
The University of Sydney

Your Tutors

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- Tutorial slide decks will be published on Canvas every Friday evening.

Ideating and Brainstorming

The 10 Plus 10 Method

Ideation and sketching user experience

Based on: Sketching User Experiences : The Workbook
by Saul Greenberg, , Bill Buxton, , Sheelagh Carpendale, and Nicolai Marquardt

THE 10 PLUS 10 METHOD

1. State your design challenge.
   - Framed as a particular problem or
   - need stated by a client, or
   - even just as a desire to build a novel system

E.g. A case when you may want to connect your mobile smart phone to a nearby person's smart phone, for example, to exchange information such as photos and contacts.

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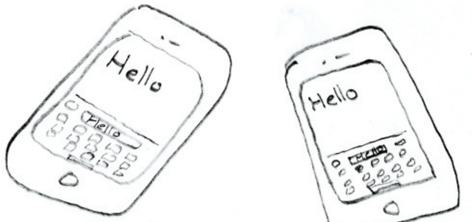
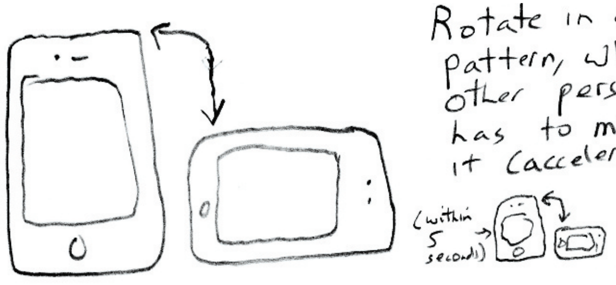
THE 10 PLUS 10 METHOD

2. Generate 10 or more different design concepts of a system that addresses this challenge. (Sketch)

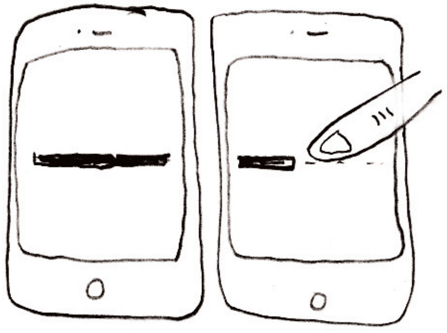
- Akin to brainstorming
- Goal is to be as creative and diverse as possible concepts
- Don’t judge the merits of these concepts



Both people type a word chosen by them



Rotate in a pattern, where other person has to mimic it (accelerometer)



Synchronous gesture

Trace a line across both side by side devices as a single stroke

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THE 10 PLUS 10 METHOD

3. Reduce the number of design concepts.

- Review your concepts
- discard those that don’t seem to have much merit
- For those that remain, show and explain your design(s) to others

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THE 10 PLUS 10 METHOD

4. Choose the most promising design concept(s) as a starting point.

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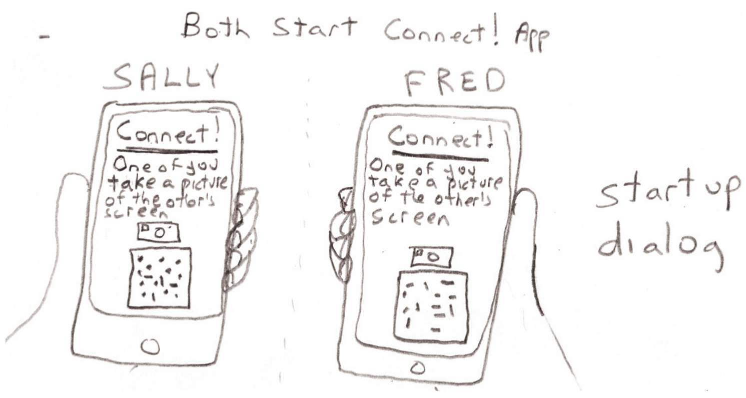
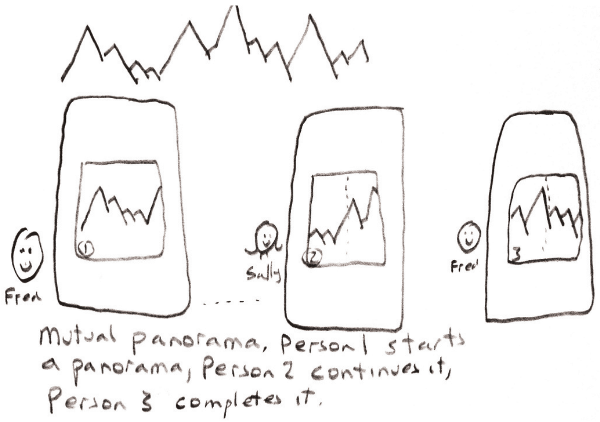
THE 10 PLUS 10 METHOD

5. Produce 10 details and/or variations of a particular design concept.

- First, try to generate different ways of realizing that particular concept
- Second, go a bit deeper into a particular concept, where you try to flesh out details of your idea


Both Start Connect! App
SALLY
FRED
Connect!
One of you take a picture of the other's screen
Connect!
One of you take a picture of the other's screen
start up dialog


1
2
3
Fred
Sally
Fred
Mutual panorama, Person 1 starts a panorama, Person 2 continues it, Person 3 completes it.

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THE 10 PLUS 10 METHOD

6. Present your best idea(s) to a group.
   - Solicit feedback from them
   - Tell your audience that the best feedback they can give will be suggestions about possible redesigns

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THE 10 PLUS 10 METHOD

7. As your ideas change, sketch them out.

  - Continue to refine and generate your concept as needed

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Generating Ideas

Ideation and sketching
user experience

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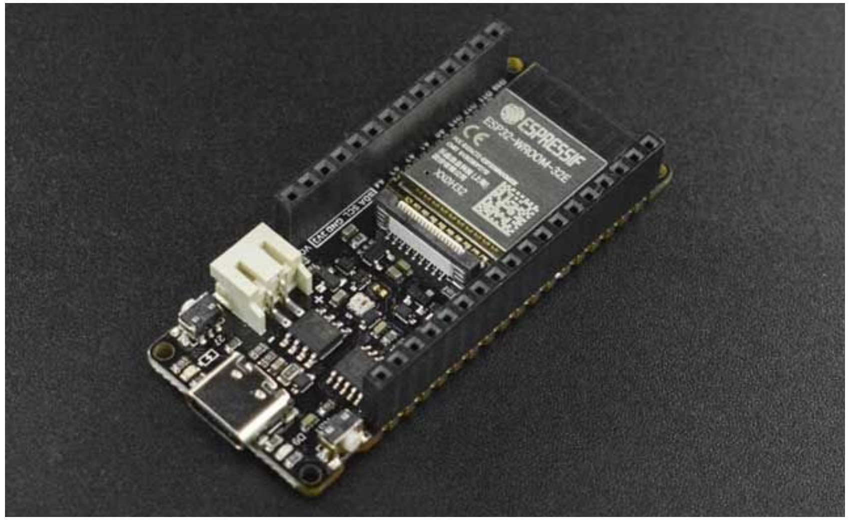
Project Groups

- We will setup groups with 4 students per group
- You will be able to see the groups in Canvas

Lets collect group kits!

- Each group gets one kit + esp32
  - Your group needs to sing for it

Kitronik
INVENTOR'S KIT
FOR ARDUINO (NOT INCLUDED)
INCLUDES OVER 50 PARTS PLUS A TUTORIAL BOOK!
THE SIMPLE WAY TO LEARN ABOUT CREATING CIRCUITS AND CODE
INCLUDES OVER 50 PARTS!

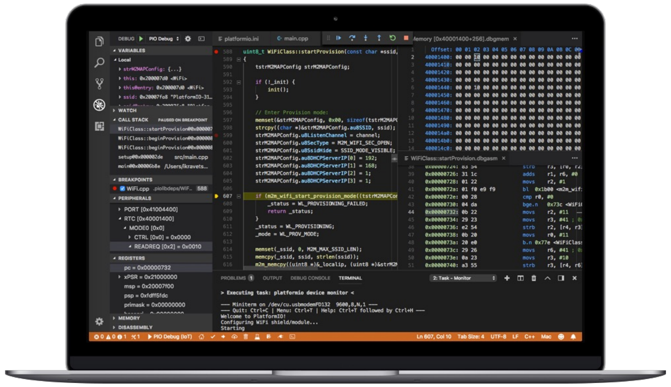


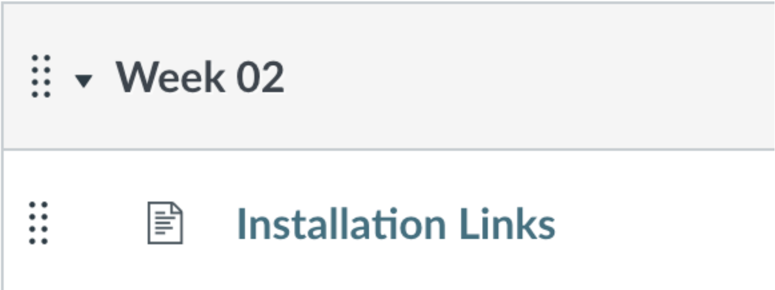
https://core-electronics.com.au/kitronik-inventor-s-kit-for-the-arduino.html

https://core-electronics.com.au/firebeetle-esp32-e-iot-microcontroller-with-header-supports-wi-fi-bluetooth.html

What Are We Doing Today

- Run a sample application in your Microcontroller
- Install
  - Goto Week 02 Module – Installation Links (Canvas) and install each tool step by step



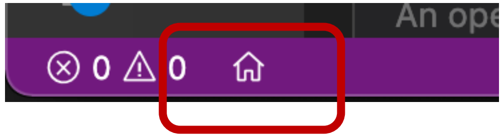


▾ Week 02

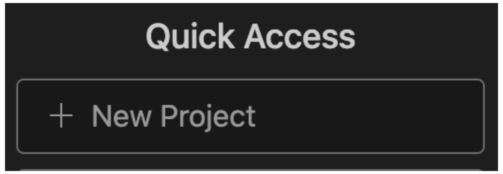
Installation Links

Create New Project: Open VSC

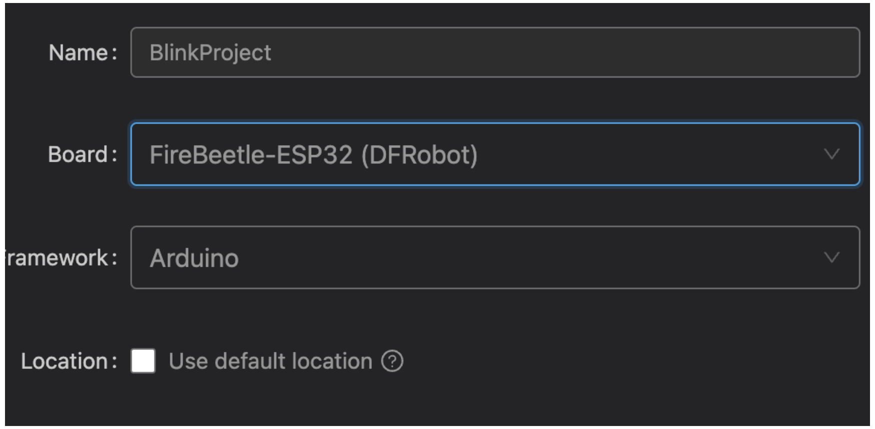
- Goto Platform IO Home
  - Use the bottom bar home icon



- Use "+ New Project"



- Use the correct settings
  - Name can be anything
  - Board and Framework fixed
  - Use an appropriate location
  - Then Click Finish
    - Will take time to initialize



Name : BlinkProject

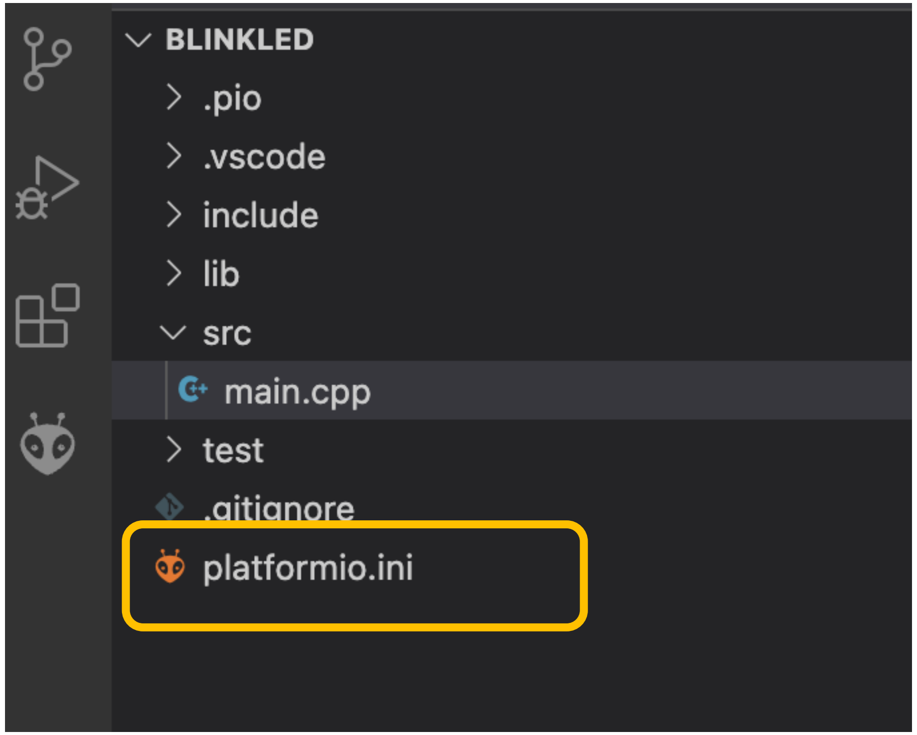
Board : FireBeetle-ESP32 (DFRobot)

ramework : Arduino

Location : □ Use default location

Lets Blink the LED

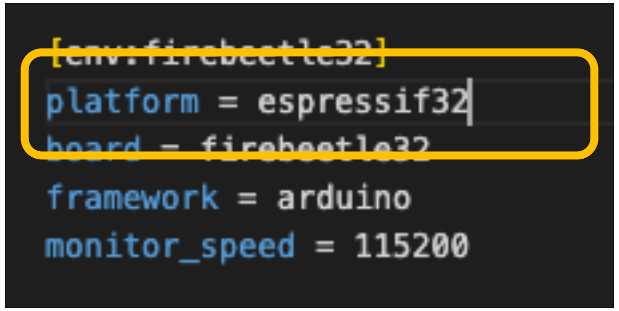
- Locate the platfromio.ini file



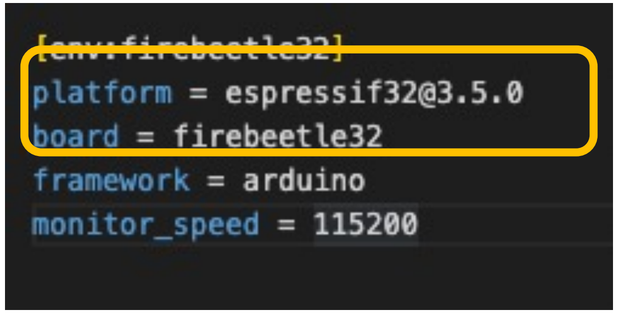
```
BLINKLED
  .pio
  .vscode
  include
  lib
  src
    main.cpp
  test
  .gitignore
  platformio.ini
```

Lets Blink the LED

- Locate the change the library version
  - platform = espressif32@3.5.0



```
[env:firebeetle32]
platform = espressif32
board = firebeetle32
framework = arduino
monitor_speed = 115200
```



```
[env:firebeetle32]
platform = espressif32@3.5.0
board = firebeetle32
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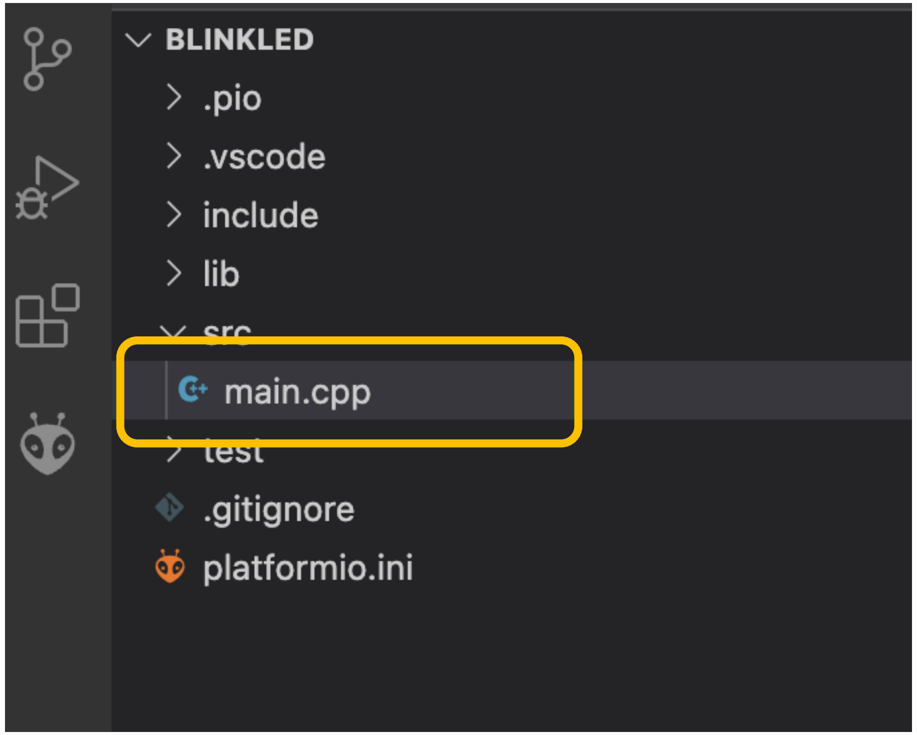
monitor_speed = 115200
```

Lets Blink the LED

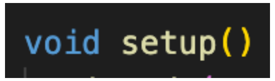
- Locate the main.cpp file



BLINKLED
- .pio
- .vscode
- include
- lib
- src
  - main.cpp
- test
- .gitignore
- platformio.ini

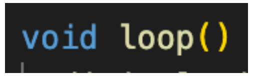
Lets Blink the LED

- Two Important functions



```
void setup()
```

- Setting up things
  - E.g. initialize variables
  - Only run once

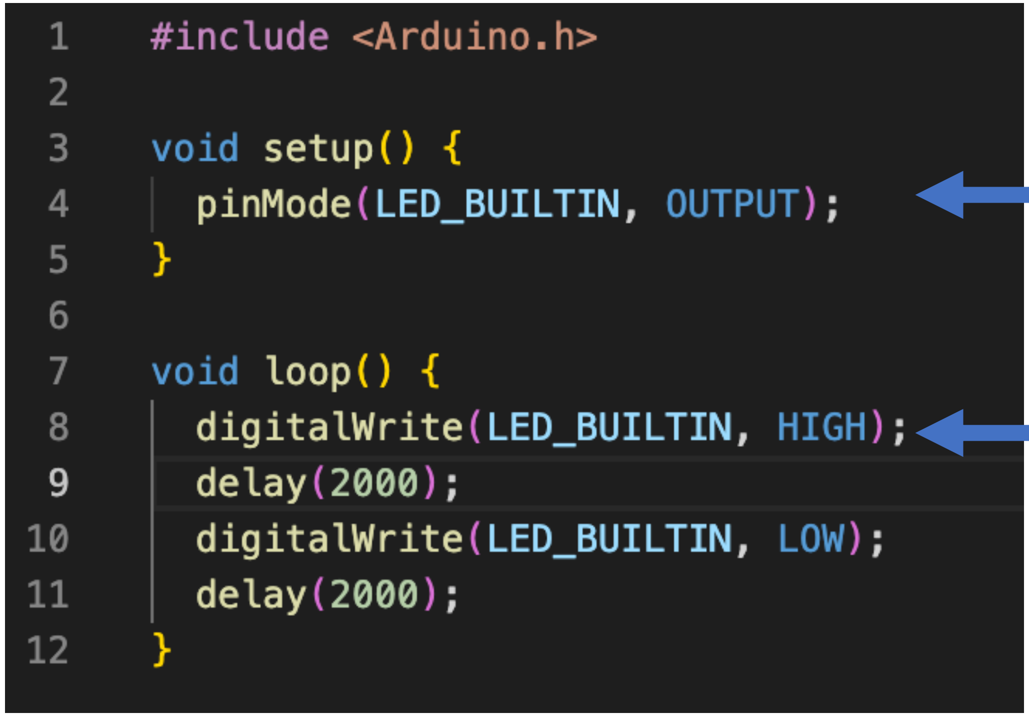


```
void loop()
```

- Runs in a loop
  - Do your work here

Lets Blink the LED

- Lets write the code



```
#include <Arduino.h>

void setup() {
  pinMode(LED_BUILTIN, OUTPUT);
}

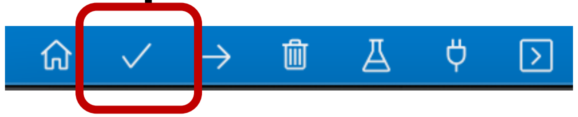
void loop() {
  digitalWrite(LED_BUILTIN, HIGH);
  delay(2000);
  digitalWrite(LED_BUILTIN, LOW);
  delay(2000);
}
```

Set the LED_BUILTIN pin to output
LED_BUILTIN – Is a pin number

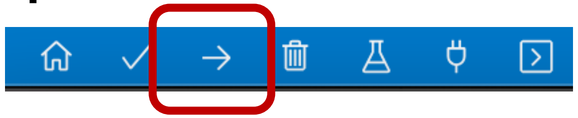
Set the LED_BUILTIN pin to high and low
(turns on and off) with a delay of 2000ms in between

Lets Blink the LED

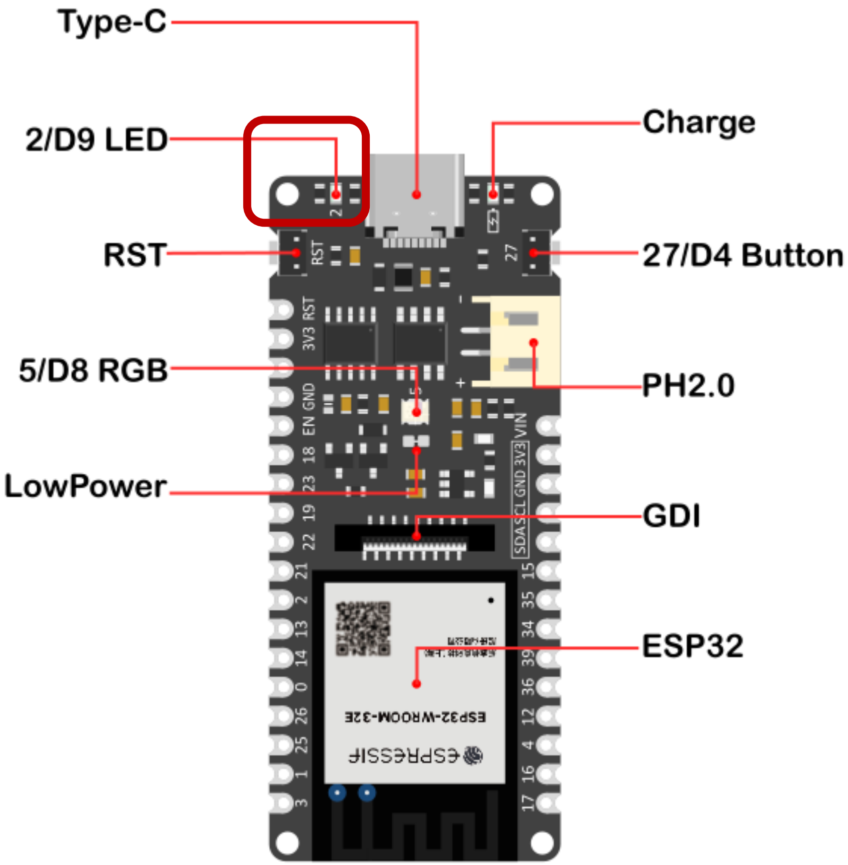
- Compile



- Upload to the board

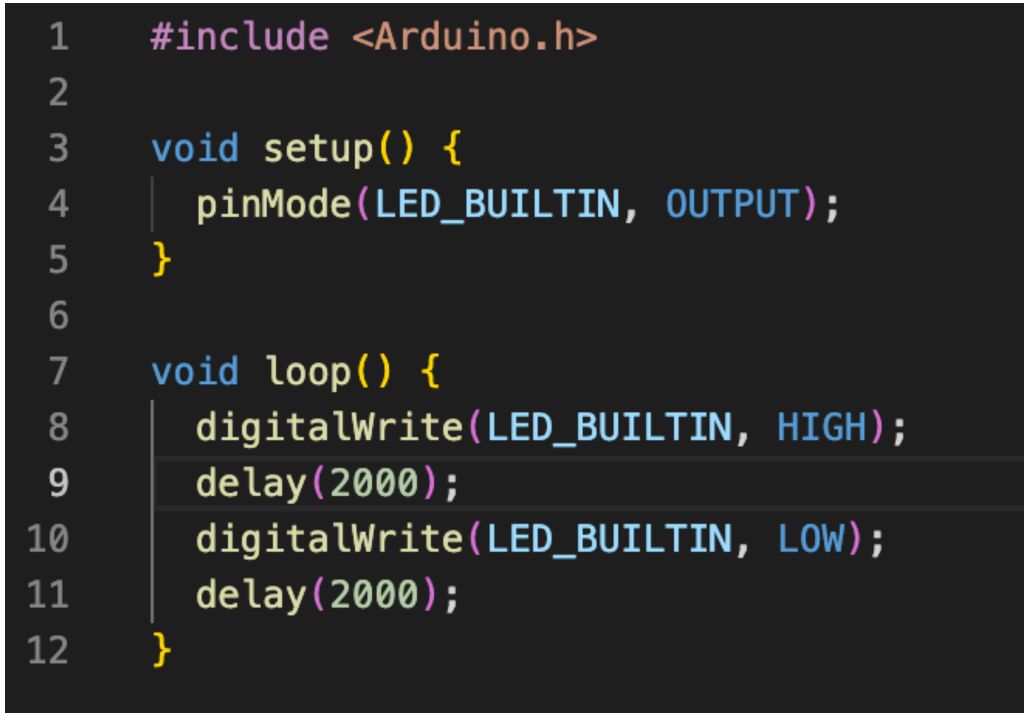


- Check the LED



Lets Blink the LED

- Play around with different delays



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}
```

Or try other samples

- **https://bit.ly/3Q4h1a9**