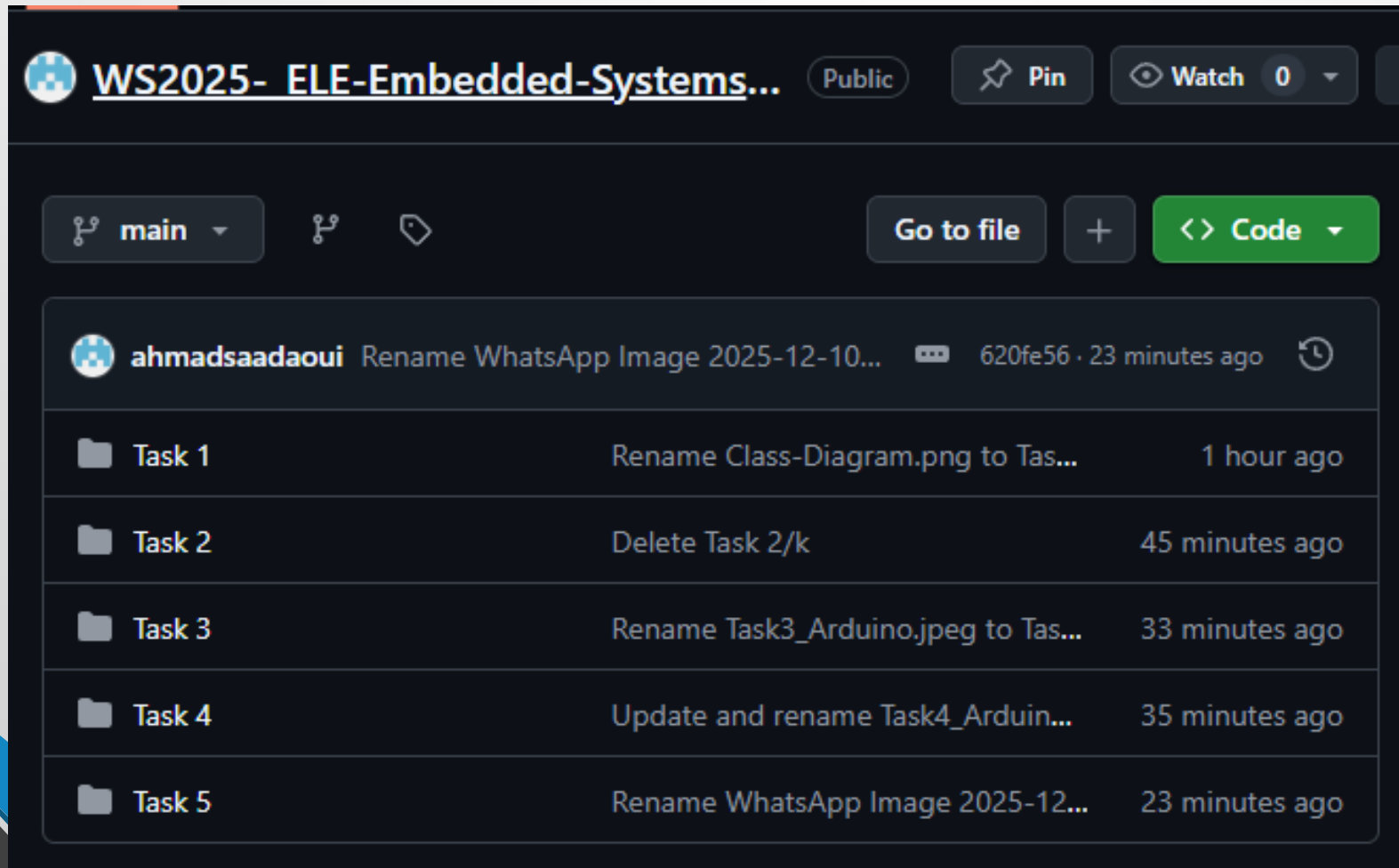# Embedded Systems Lab Project

Tasks 1–5 | Arduino Traffic Light System

# Overview & Git Structure

- Repository structure

# Task 1 –Traffic LightSystem

- Arduino code(Traffic Light logic)
- UML diagram
- Sequencediagram
- Simulationcircuit

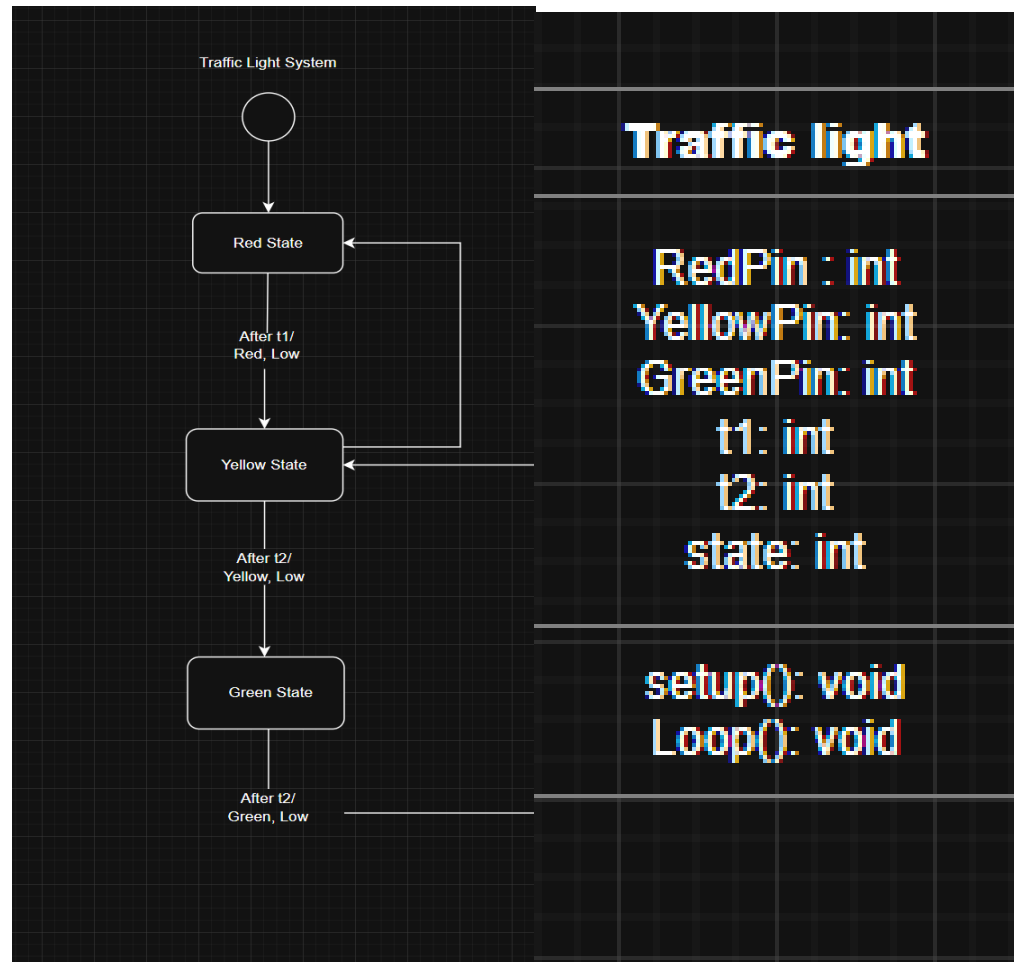| Name | Last commit message | Last commit date |
|------|--------------------|-----------------|
| .. | | |
| Task1_Circuit.png | Rename Circuit-Task-1.png to Task1_Circuit.png | 1 hour ago |
| Task 1_Class-Diagram.png | Rename Class-Diagram.png to Task 1_Class-Diagram.png | 1 hour ago |
| Task 1_Simulation Circuit in Multisim.jpeg | Rename Simulation Circuit in Multisim_Task 1.jpeg to Task 1_Si... | 1 hour ago |
| Task1_ UMLDiagram.png | Rename UMLDiagram_Task1.png to Task1_ UMLDiagram.png | 1 hour ago |
| Task1_ArduinoCode.c | Add files via upload | 1 hour ago |

- UML diagram

- Sequencediagram



Traffic Light System

Red State

After t1/
Red, Low

Yellow State

After t2/
Yellow, Low

Green State

After t2/
Green, Low

**Traffic light**

RedPin : int
YellowPin: int
GreenPin: int
t1: int
t2: int
state: int

setup(): void
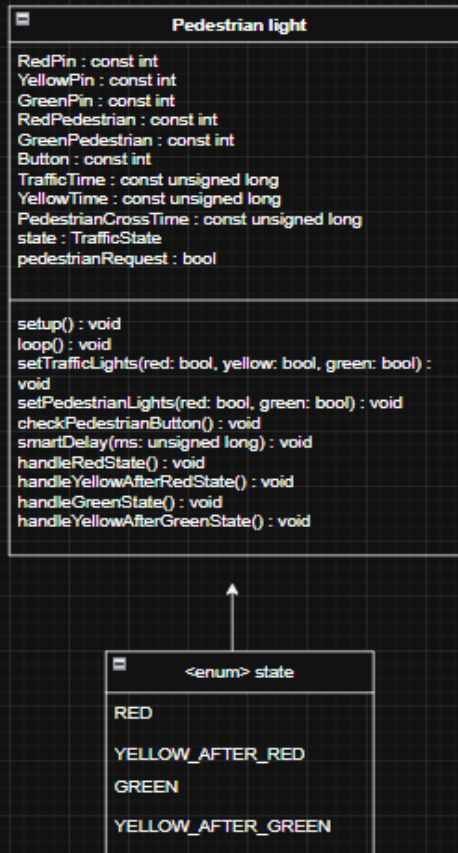Loop(): void

# Simulation circuit(wokwi)
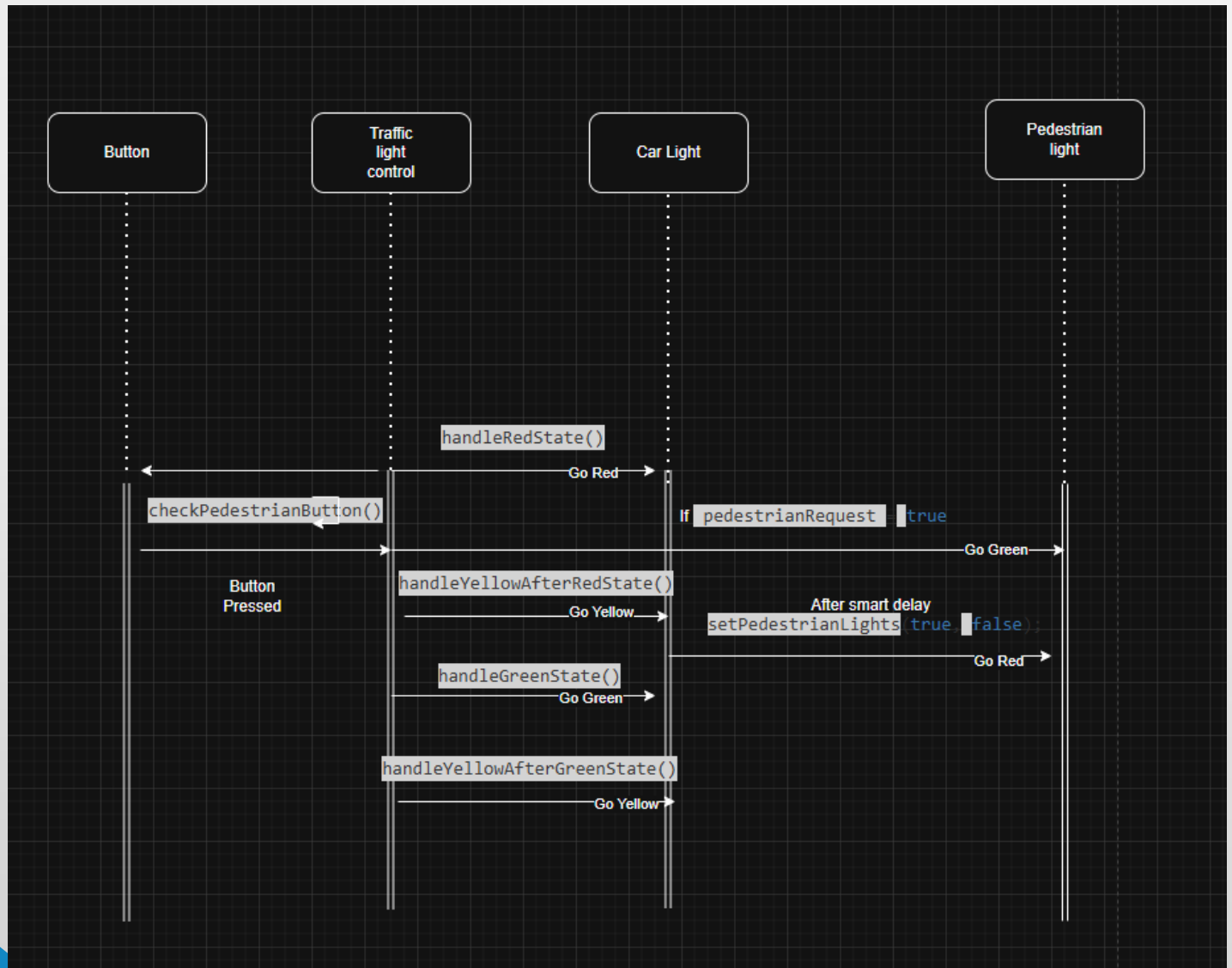
# Task 2 – Traffic + Pedestrian Light

- Extended Arduino code
  - Pedestrian traffic light logic
  - Updated UML & sequence diagrams
  - Simulation circuit

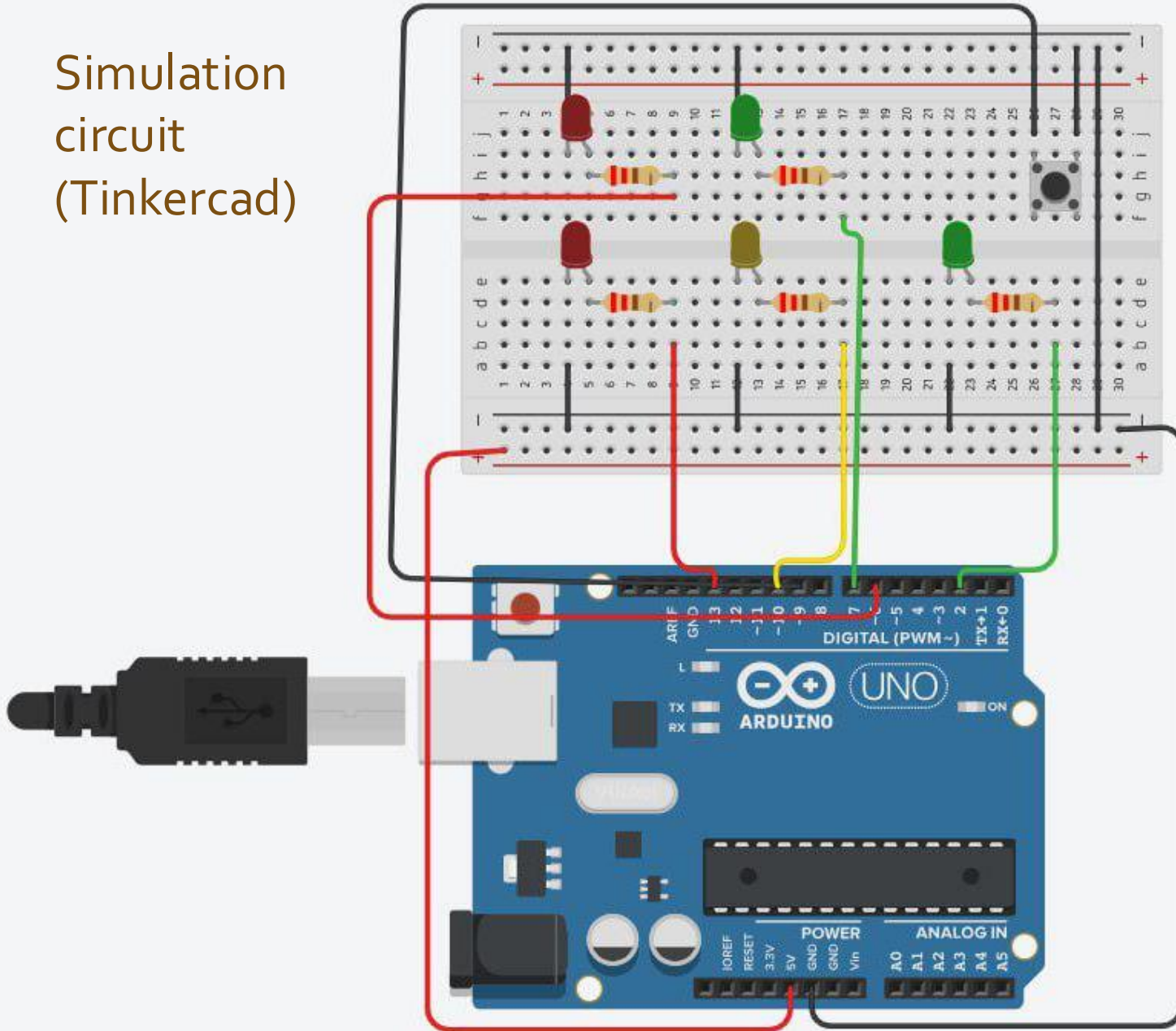| Name | Last commit message | Last commit date |
| --- | --- | --- |
| 📁 .. | | |
| 📄 Task2_Class-Diagram.png | Rename Class-Diagram2.png to Task2_Class-Diagram.png | 1 hour ago |
| 📄 Task2_ArduinoCode.cpp | Add files via upload | 1 hour ago |
| 📄 Task2_Circuit.jpeg | Add files via upload | 1 hour ago |
| 📄 Task2_UMLDiagram.png | Rename UMLDiagram_Task2.png to Task2_UMLDiagram.png | 1 hour ago |

## sequence diagrams

# Updated UML diagrams
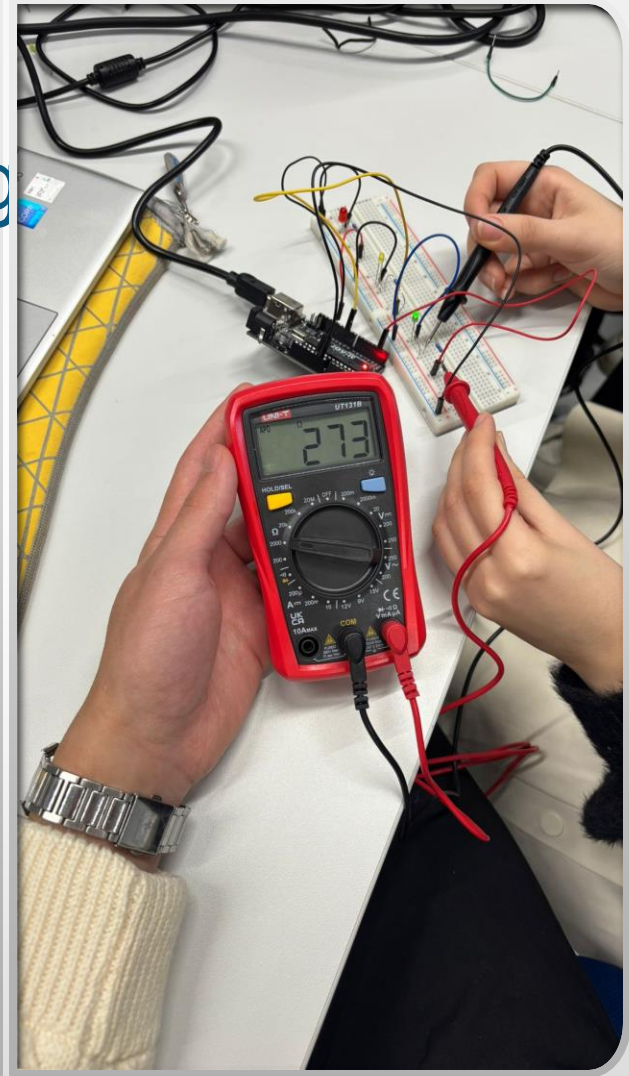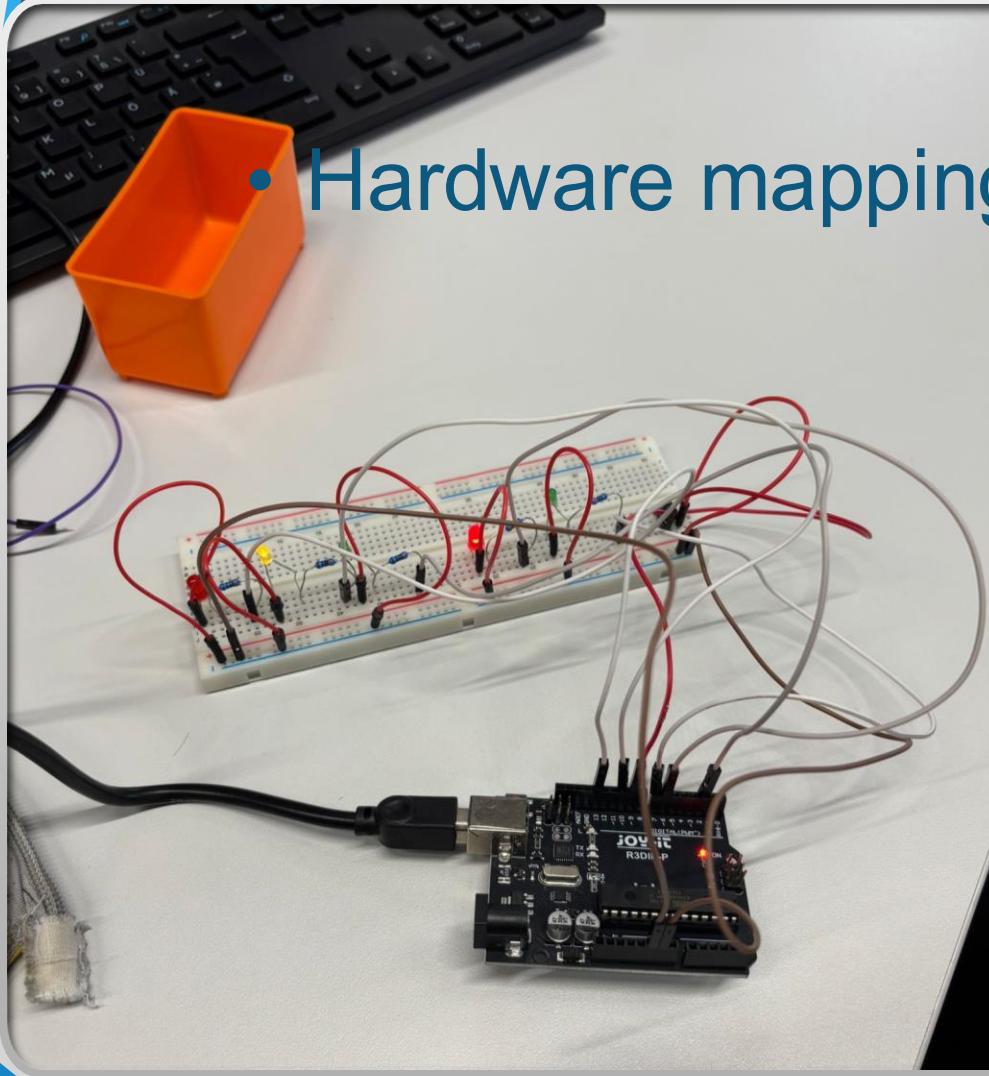
Simulation
circuit
(Tinkercad)

# Task 3 – Physical Arduino (Task 1)

- Image of real Arduino setup
  - Traffic light implementation
  - Hardware mapping
  - Calculation using multimeter

| Name | Last commit message | Last commit date |
|---|---|---|
| 📁 .. | | |
| 📄 Task3_ArduinoCircuit.jpeg | Rename Task3_Arduino.jpeg to Task3_ArduinoCircuit.jpeg | 52 minutes ago |
| 📄 Task3_ArduinoCode.c | Rename Task3_ArduinoCode (1).c to Task3_ArduinoCode.c | 1 hour ago |
| 📄 Task3_calculation.jpeg | Add files via upload | 1 hour ago |

Hardware mapping

# Task 4 – Physical Arduino (Task 2)

- Image of real Arduino setup
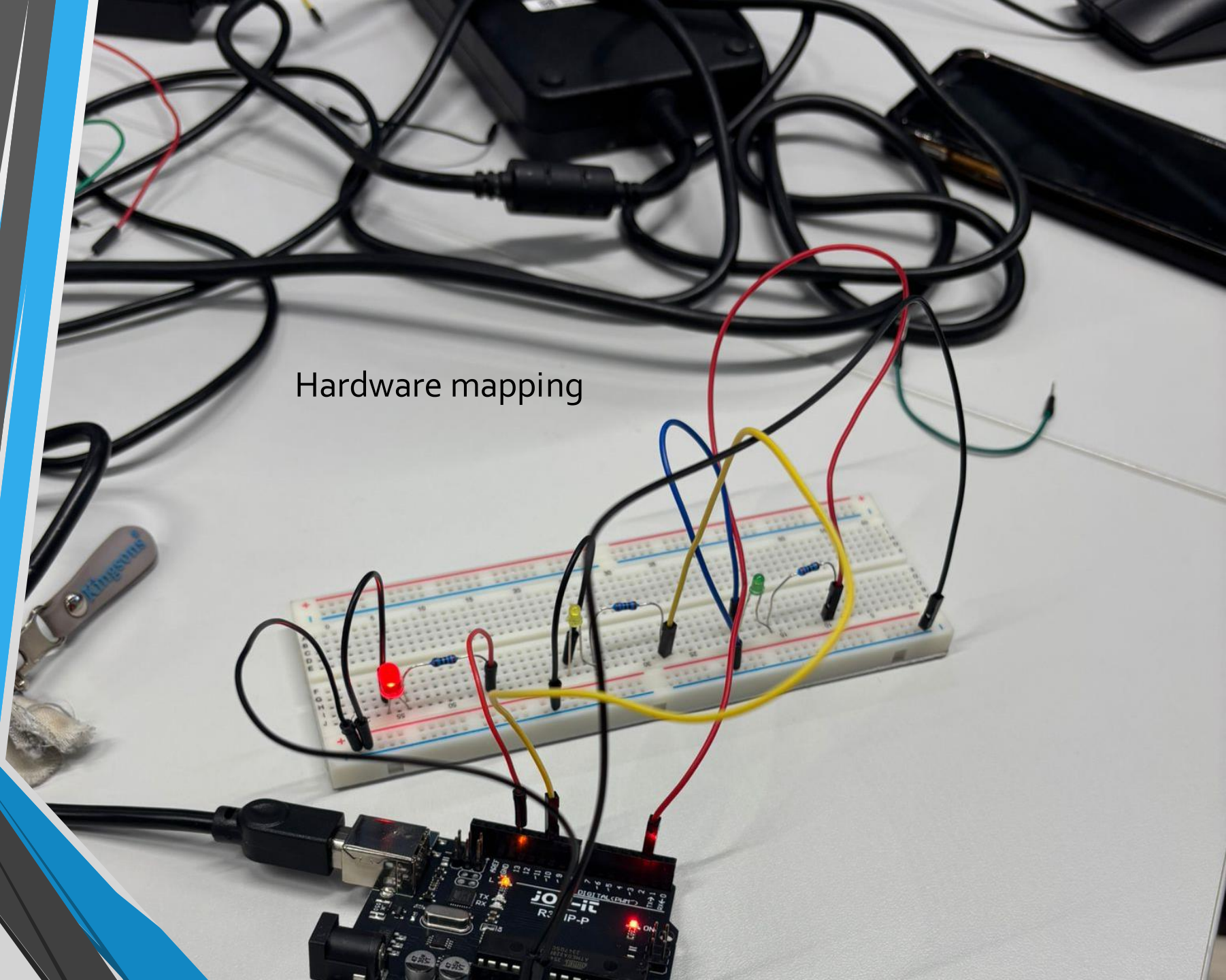  - Traffic + pedestrian lights
  - Hardware mapping

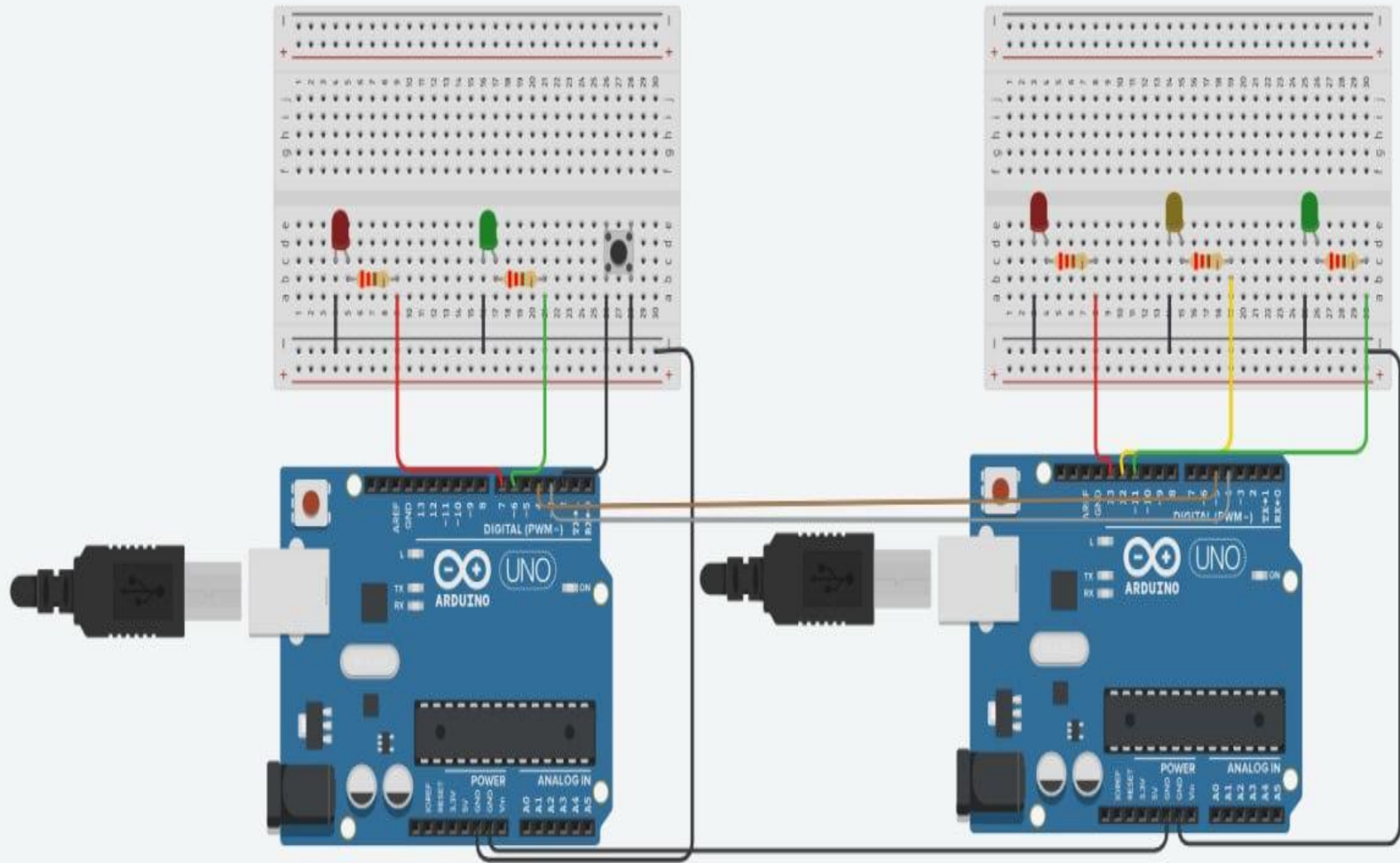| Name | Last commit message | Last commit date |
|------|---------------------|------------------|
| 📁 .. | | |
| 📄 Task4_ArduinoCircuit.jpeg | Rename Task4_Arduino.jpeg to Task4_ArduinoCircuit.jpeg | 54 minutes ago |
| 📄 Task4_ArduinoCode.cpp | Update and rename Task4_ArduinoCode (1).cpp to Task4_Ard... | 53 minutes ago |

Hardware mapping
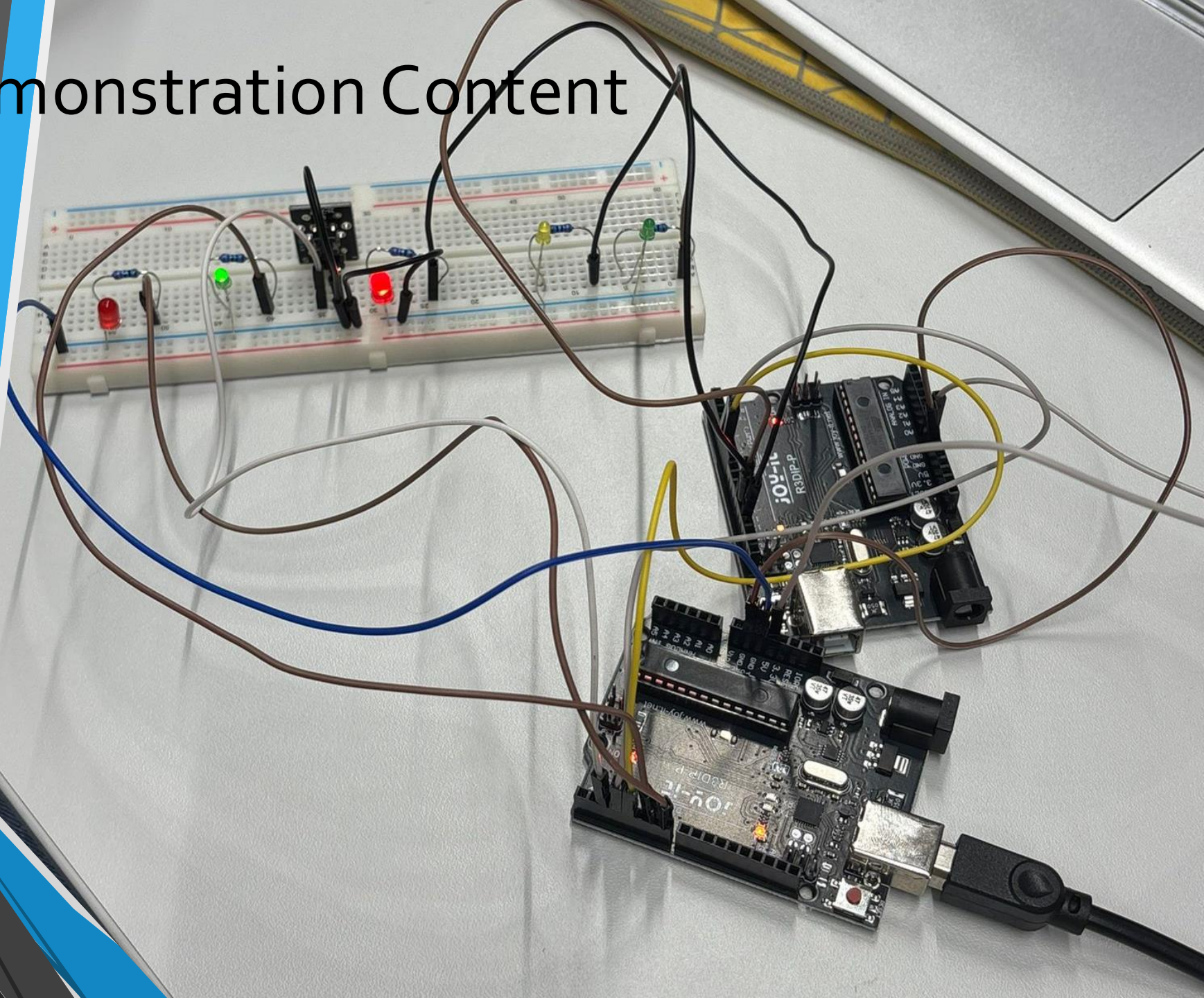
# Task 5 – Two Arduino Boards

- Arduino : Traffic light

  - Communication / separation of roles

  - Simulation and physical setup

| Name | Last commit message | Last commit date |
|---|---|---|
| 📁 .. | | |
| 📄 Task5_TinkercadCircuit.jpeg | Rename WhatsApp Image 2025-12-10 at 20.27.54_df16233a.j... | 1 hour ago |
| 📄 Task5_ArduinoCode.c | Create Task5_ArduinoCode.c | 1 hour ago |
| 📄 Task5_TinkercadCircuit.jpg | Rename WhatsApp Image 2025-12-10 at 21.43.40_517c23f4.jp... | 1 hour ago |

# Simulation circuit (tinkercad)

# Demonstration Content

# Conclusion

- All tasks implemented and tested

  - Professional Git workflow

  - Clear diagrams and simulations

  - Ready for lab presentation