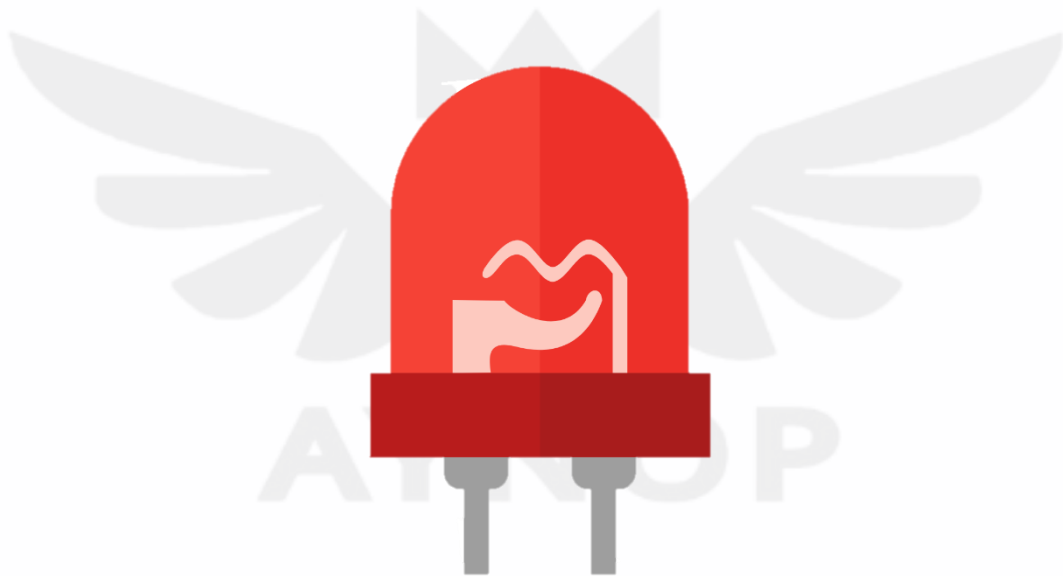LAUNCH THE PROJECT - 00

On Board LED Blink

On AYNOP® UNO Launchpad Kit

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1. Overview

This first project demonstrates how to blink the **onboard LED** on the Arduino® UNO R4 Minima. It's the simplest program to verify your board, IDE setup, and USB connection.

You will learn to:

- Power and connect your board.
- Upload a basic sketch to the UNO R4 Minima.
- Observe the onboard LED blink at a fixed interval.

2. Components Required

- Arduino® UNO R4 Minima board
- USB Type-C data cable
- No additional components are required as this project uses the onboard LED connected to digital pin D13 (LED_BUILTIN)

3. Software Required

- Arduino IDE (v2.3.6 or later recommended)
- No additional libraries required.

Note:

We assume the **Arduino UNO R4 Minima board package** is already installed on your machine, as explained in the 00_Getting_Started/00_GettingStarted_Arduino_R4_Minima guide. If it is not installed, please refer to that document and complete the installation before proceeding.

4. Hardware Setup

No external wiring is required for this project. The onboard LED is already connected internally to pin D13.

Only for reference, we've included a Wiring Diagram and a Circuit Schematic for better clarity.

4.1   Wiring Diagram

- Connect the Arduino UNO R4 Minima board to your computer using a USB Type-C cable.
- No external wiring is needed for this project — the LED is mounted on the UNO R4 Minima board.
- Ensure the board is placed on a flat, non-conductive surface and there are no loose connections on other circuits you may have attached.
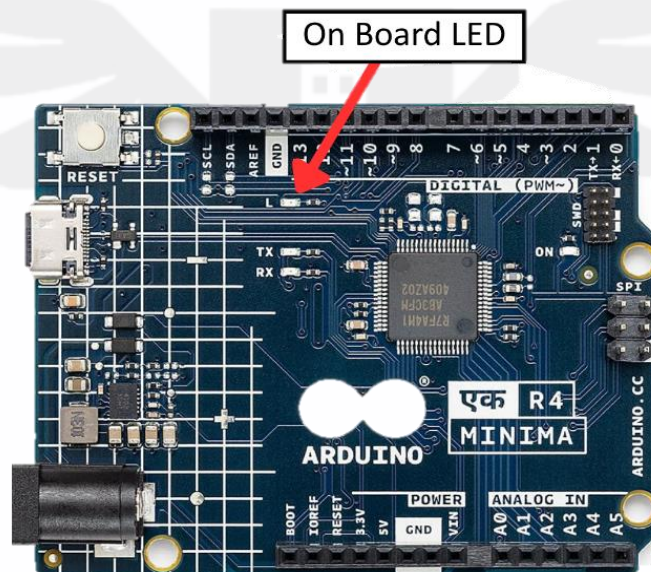

Figure 4.1 – Wiring diagram for On Board LED Blink project

💡 **Tip** Always disconnect the USB cable before making or changing any hardware connections. This project is safe, but the habit protects your board in advanced setups.

4.2   Circuit Schematic

- **R =** Internally connected **330 Ω resistor** (current limiting resistor)
- **L =** Internally connected **LED** (SMD)
- Arduino **D13** provides the signal, and **GND** completes the circuit
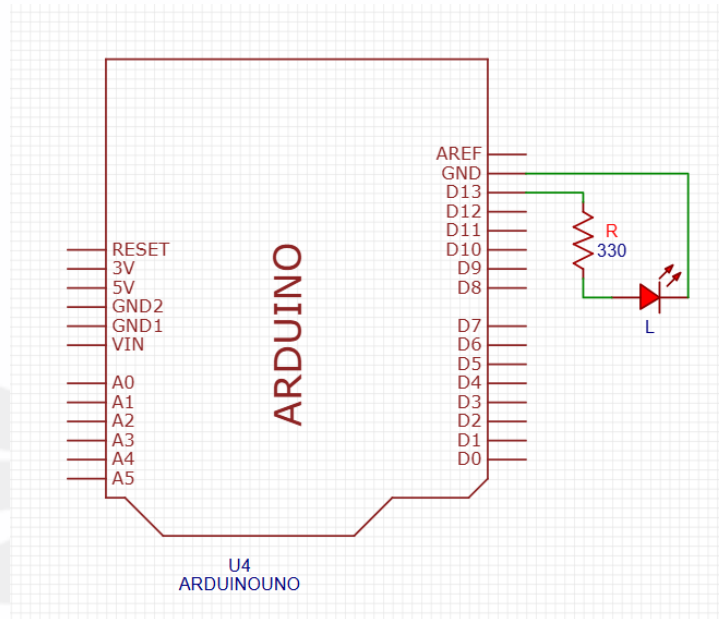

Figure 4.2 – Circuit schematic for ON Board LED Blink project

5. Principle – How It Works

The UNO R4 Minima includes a built-in LED (labelled L, associated with pin 13 / LED_BUILTIN).

- LED_BUILTIN maps to the onboard LED pin in the Arduino core for this board.
- The sketch toggles the LED pin between HIGH (LED ON) and LOW (LED OFF), pausing between states with delay() to create a visible blink.

This simple I/O exercise verifies that the board can be programmed and communicate with the Arduino IDE.

6. Procedure – Steps to Run

1. **Build the Circuit**
   a. Assemble the circuit as shown in the **Wiring Diagram (Figure 4.1)**.

2. **Connect the Board**
   a. Use a USB Type-C data cable to connect your UNO R4 Minima to your computer.

3. **Open the Project Code**
   a. Simply **double-click** the file *00_Led_Blink_OnBoard.ino* in the project folder, and it will open directly in the Arduino IDE (if installed).

4. **Confirm Board Selection**
   a. The IDE usually auto-detects the UNO R4 Minima if the package is installed.
   b. If not installed, refer to the *00_Getting_Started/00_GettingStarted_Arduino_R4_Minima* document to install the necessary board package.
   c. Verify that *Arduino UNO R4 Minima* is selected in the IDE's board selector (top toolbar).

5. **Upload the Code**
   a. Click the **Upload** button (arrow icon) in the top-left corner of the IDE.
   b. Wait until the console displays "**Done uploading**.".

6. **Observe the LED**
   a. The onboard LED (LED_BUILTIN) will blink ON for 1 second and OFF for 1 second repeatedly.

7. **(Optional) Experiment**
   a. Edit the macro **BLINK_INTERVAL_MS** in the .ino file to change blink speed (try 250 → 2000 ms).
   b. Upload the code again to see the resulting effect.

7. Expected Output

Once the code is uploaded successfully:

- The onboard LED (labelled **L**) blinks **ON (lit)** for **1 second**, then **OFF (dark)** for **1 second**, repeating continuously until the board is reset or powered down**.**

8. Code

The source code for this project is included in the downloaded folder:

📁 *uno-launchpad-kit/01_Basic_Projects/00_Led_Blink_OnBoard/00_Led_Blink_OnBoard.ino*

👉 **Tip:**

- To open the project, simply **double-click the .ino file**. If the Arduino IDE is installed, it will launch automatically and load the code.
- If you **haven't installed the Arduino IDE yet**, please refer to:
  📁 uno-launchpad-kit/00_Getting_Started/00_GettingStarted_Arduino_R4_Minima to **download and install it**

8.1   Function References

- setup() – runs once when the board is powered on or reset.
- loop() – runs continuously after setup() finishes.
- pinMode(pin, mode) – configures a pin as either **INPUT** or **OUTPUT**.
- digitalWrite(pin, value) – writes a digital value (**HIGH** or **LOW**) to a pin.
- delay(ms) – pauses the program for the specified number of milliseconds.

📚 **Arduino Reference:**

- setup()
- loop()
- pinMode()
- digitalWrite()
- delay()

📚 **For more details and advanced usage, visit:**

🔗 Arduino Language Reference — The official guide for all Arduino functions.

9. Troubleshooting Tips

- **LED not blinking?**
  - o Verify the upload succeeded (console shows **"Done uploading."**).
  - o Confirm the correct board is selected in the IDE.
  - o Make sure you used a **data-capable USB Type-C cable** (some cables are power-only).
  - o Try pressing the **RESET** button and upload again

- **Upload error in Arduino IDE?**
  - o Verify that the correct board (**Arduino UNO R4 Minima**) is selected in the IDE.
  - o Check that the correct **COM port** is chosen.

- **Board not detected?**
  - o Ensure you are using a **data-capable USB Type-C cable** (some cables only provide charging).
  - o Try reconnecting the cable or using a different USB port.

- **Board not listed in Arduino IDE?**
  - o If you don't see **Arduino UNO R4 Minima** in the board selector, the **board package is not installed**.

  - o To fix this, follow the installation steps in:
    📂 *uno-launchpad-kit/00_Getting_Started/00_GettingStarted_Arduino_R4_Minima*

💡 **Tip:** If nothing works, press the **RESET** button on the UNO R4 Minima and try uploading the code again.

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11. Support & Feedback

We value your feedback and are happy to assist with any questions, troubleshooting, or suggestions you may have.

✉ Email: *support@aynop.com*

When sending an email, please include your kit name (AYNOP® UNO Launchpad Kit) and, if applicable, the project name in the subject line. This will help our team respond faster and more accurately. We aim to respond to all queries within 2–3 business days. Your feedback helps us improve our products and create even better learning experiences for all Arduino beginners.