Project 01: Blinking LED

Components needed:
- Arduino Uno board
- LED

```
// Project 01: Blinking LED
// Source: Getting Started with Arduino, 3rd edition by Massimo Banzi and Michael Shiloh

int LED = 13; // LED connected to digital PIN 13

void setup() {
  pinMode(LED, OUTPUT); // sets the digital PIN as output
}

void loop() {
  digitalWrite(LED, HIGH); // turns the LED on
  delay(1000); // waits for a second (1000 milliseconds)
  digitalWrite(LED, LOW); // turns the LED off
  delay(1000); // waits for a second (1000 milliseconds)
}
Projects 02, 03 and 03B

Components needed:
- Arduino Uno board
- LED
- 3 jumper wires
- 10k ohm resistor
- breadboard
- push button
int LED = 13;  // the pin for the LED
int BUTTON = 7;  // the input pin where the pushbutton is connected
int val = 0;  // val will be used to store the state of the input pin

void setup() {
  pinMode(LED, OUTPUT);  // tell Arduino LED is an output
  pinMode(BUTTON, INPUT);  // and BUTTON is an input
}

void loop() {
  val = digitalRead(BUTTON);  // read input value and store it

  // Check whether the input is HIGH (button pressed)
  if (val == HIGH) {
    digitalWrite(LED, HIGH);  // turn LED on
  } else {
    digitalWrite(LED, LOW);  // turn LED off
  }
}
int LED = 13;  // the pin for the LED
int BUTTON = 7;  // the input pin where the pushbutton is connected
int val = 0;     // val will be used to store the state of the input pin
int old_val = 0; // this variable stores the previous value of "val"
int state = 0;   // 0 = LED off while 1 = LED on

void setup() {
  pinMode(LED, OUTPUT);  // tell Arduino LED is an output
  pinMode(BUTTON, INPUT);  // and BUTTON is an input
}

void loop() {
  val = digitalRead(BUTTON);  // read input value and store it

  // Check if there was a transition
  if ((val == HIGH) && (old_val == LOW)) {
    state = 1 - state;
  }

  old_val = val;  // val is now old, let's store it

  if (state == 1) {
    digitalWrite(LED, HIGH);  // turn LED on
  } else {
    digitalWrite(LED, LOW);   // turn LED off
  }
}

// Project 03 with debouncing!
Insert just the red text into the code above, as shown here:

......

// Check if there was a transition
if ((val == HIGH) && (old_val == LOW)) {
  state = 1 - state;
  delay(50);
}

......
Project 04: Turn on LED while light is hitting a light dependent resistor

Components needed:
- Arduino Uno board
- LED
- 3 jumper wires
- 10k ohm resistor
- breadboard
- light dependent resistor (sometimes called a *photoresistor*).

```c
// Project 04: Turn on LED while light is hitting a light dependent resistor
// Source: Getting Started with Arduino, 3rd edition by Massimo Banzi and Michael Shiloh

int LED = 13;      // the pin for the LED
int RESISTOR = 7;  // the input pin where the light dependent resistor is connected
int val = 0;       // val will be used to store the state of the input pin

void setup() {
  pinMode(LED, OUTPUT);  // tell Arduino LED is an output
  pinMode(RESISTOR, INPUT); // and RESISTOR is an input
}

void loop() {
  val = digitalRead(RESISTOR); // read input value and store it

  // Check whether the input is HIGH (light is hitting resistor)
  if (val == HIGH) {
    digitalWrite(LED, HIGH); // turn LED on
  } else {
    digitalWrite(LED, LOW);  // turn LED off
  }
}
```
Project 5: Blink LED at a rate specified by the value of the analog input

Components needed:
- Arduino Uno board
- LED
- 3 jumper wires
- 10k ohm resistor
- breadboard
- light dependent resistor (sometimes called a photoresistor)
// Project 5: Blink LED at a rate specified by the value of the analog input
// Source: Getting Started with Arduino, 3rd edition by Massimo Banzi and Michael Shiloh

int LED = 13;  // the pin for the LED

int val = 0;   // variable used to store the value coming from the sensor

void setup() {
    pinMode(LED, OUTPUT);  // LED is an OUTPUT

    // Note: analog pins are automatically set as inputs
}

void loop() {
    val = analogRead(0);  // read the value from the sensor

    digitalWrite(LED, HIGH);  // turn the LED on
    delay(val);  // stop the program for some time
    digitalWrite(LED, LOW);  // turn the LED off
    delay(val);  // stop the program for some time

}
Learn More

Want to learn more about the basics of Arduino? Try these resources:

**Search the Brown County Library catalog for “arduino”** – [click here for a direct link](#).
We highly recommend starting out with this book:

*Getting Started with Arduino* – Massimo Banzi & Michael Shiloh

**Sparkfun – What is an Arduino?**: Sparkfun’s introductory tutorial
[learn.sparkfun.com/tutorials/what-is-an-arduino](learn.sparkfun.com/tutorials/what-is-an-arduino)

**Check out the Brown County Library’s page for more resources**: [browncountylibrary/arduino](browncountylibrary/arduino)