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Use PWM output with Arduino

Learn how to use PWM (Pulse Width Modulation) output with Arduino.

Using PWM in your sketch

Add PWM output to your sketch using the analogWrite() function.

Here's a basic example:

```
int ledPin = 9;      // LED connected to digital pin 9
int analogPin = 3;   // potentiometer connected to analog pin 3
int val = 0;         // variable to store the read value

void setup() {
  pinMode(ledPin, OUTPUT);  // sets the pin as output
}

void loop() {
  val = analogRead(analogPin);  // read the input pin
  analogWrite(ledPin, val / 4); // analogRead values go from 0 to 1023, a
}
```

Recommended PWM pins

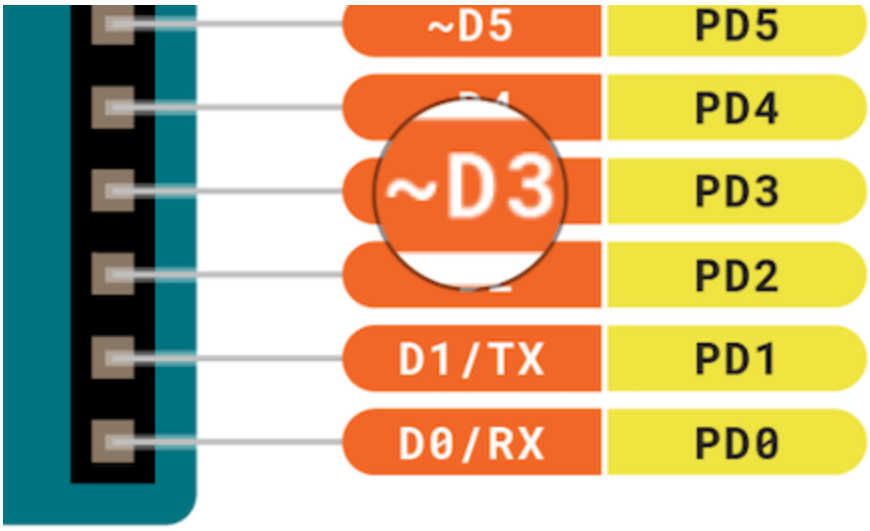
Overview for common boards

UNO R4 (Minima, WiFi)	3, 5, 6, 9, 10, 11
Mega	2 - 13, 44 - 46
GIGA R1	2 - 13
Leonardo, Micro, Yún	3, 5, 6, 9, 10, 11, 13
UNO WiFi Rev2, Nano Every	3, 5, 6, 9, 10
MKR boards**	0 - 8, 10, A3, A4
MKR1000 WiFi**	0 - 8, 10, 11, A3, A4
Zero**	3 - 13, A0, A1
Nano 33 IoT**	2, 3, 5, 6, 9 - 12, A2, A3, A5
Nano 33 BLE/BLE Sense	1 - 13, A0 - A7
Due***	2-13
101	3, 5, 6, 9

*****These pins are officially supported PWM pins. While some boards have additional pins capable of PWM, using them is recommended only for advanced users that can account for timer availability and potential conflicts with other uses of those pins.
******In addition to PWM capabilities on the pins noted above, the MKR, Nano 33 IoT, and Zero boards have true analog output when using `analogWrite()` on the `DAC0` (`A0`) pin.
*******In addition to PWM capabilities on the pins noted above, the Due has true analog output when using `analogWrite()` on pins `DAC0` and `DAC1` .

Finding PWM pins in the pinout diagrams

The **pinouts** for many boards specifify the recommended PWM pins with a tilde (**~**) symbol:



You can find pinouts on Arduino Docs.

Additional PWM pins

Many newer boards support PWM on additional pins, but their use is subject to timer availability.

Further reading

- Basics of PWM

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