Chapter 2
Getting Started

Experiment 1 – Blinking LED

```
void setup() {
  // put your setup code here, to run once:
  pinMode(PC13, OUTPUT);
}

void loop() {
  // put your main code here, to run repeatedly:
  digitalWrite(PC13, HIGH);
  delay(1000);
  digitalWrite(PC13, LOW);
  delay(1000);
}
```

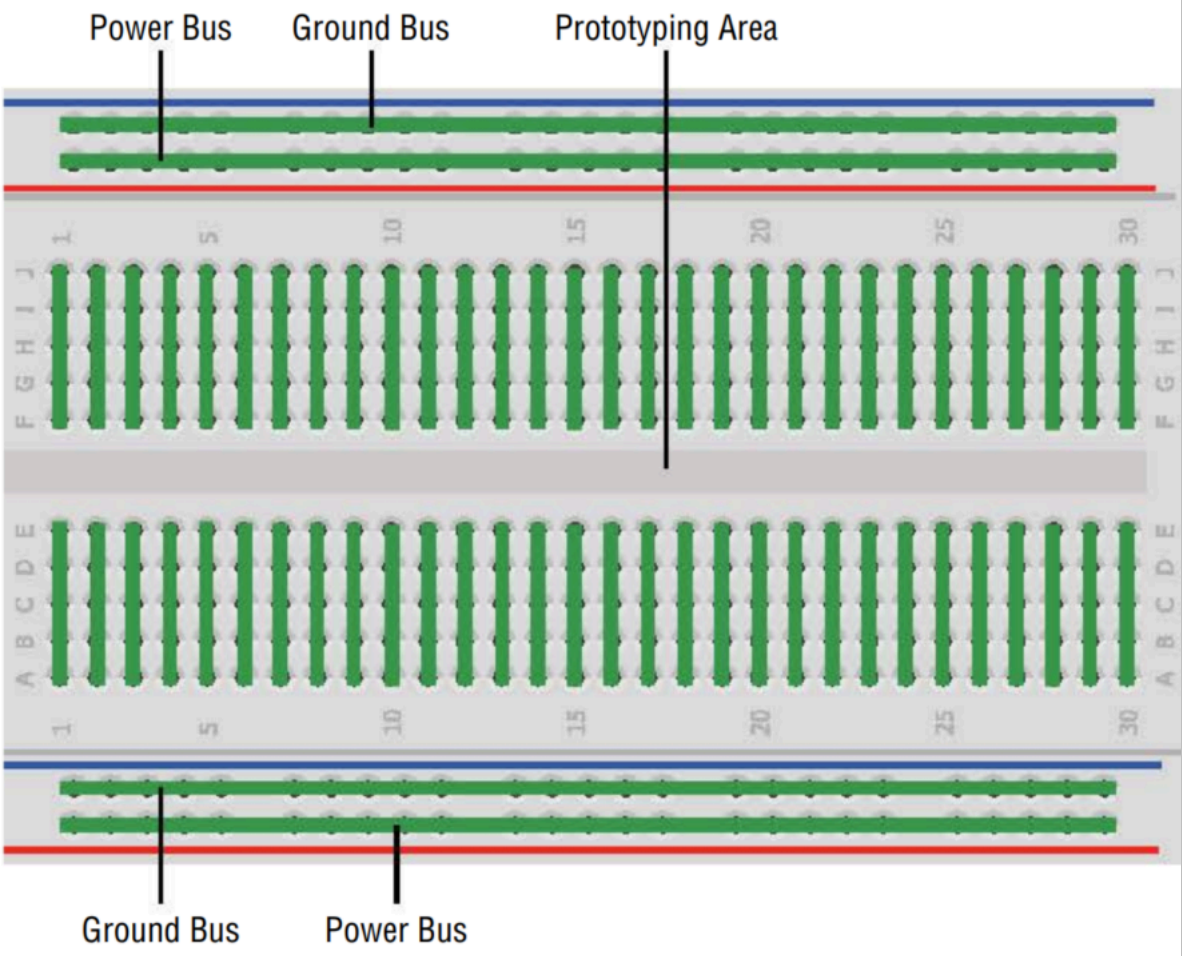

Figure 2-1: Breadboard electrical connections

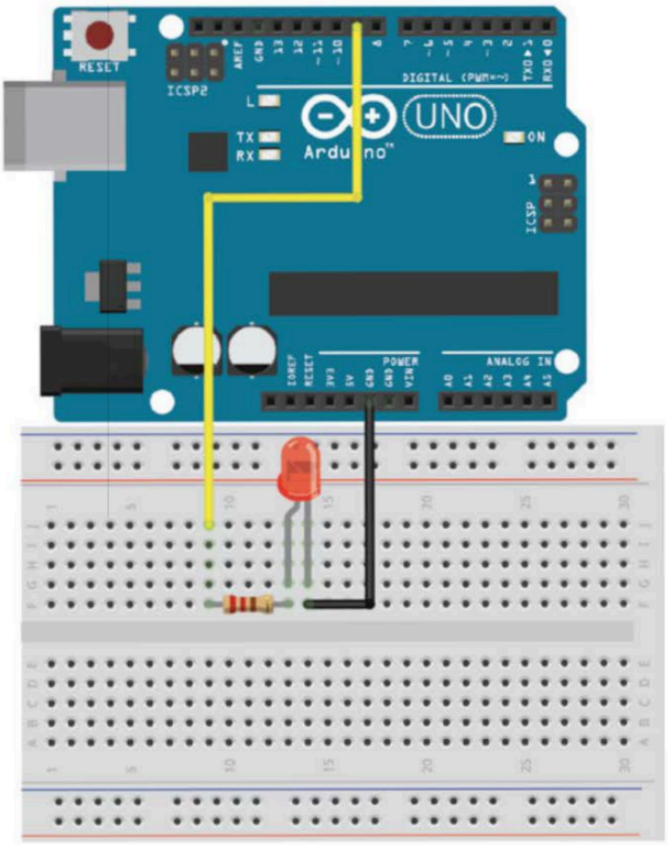

Figure 2-2: Arduino Uno wired to an LED

Figure 2-3: Simple LED circuit

220Ω resistor

List of some of the digital output pins commonly used on the Blue Pill:

1. PA0 - PA15 (Port A, Pins 0-15)
2. PB0 - PB15 (Port B, Pins 0-15)
3. PC13 - PC15 (Port C, Pins 13-15)

List of digital output pins available on the Arduino Uno:

1. Digital Pins 0 to 13: These pins can be used as digital input or output pins. Digital Pins 0 and 1 are also connected to the hardware serial interface (RX and TX), respectively.
2. Digital Pins A0 to A5: These pins can be used as digital input or output pins, in addition to their analog input functionality.

Experiment 2 - Turning On An LED

```
void setup()
{
   pinMode (PA15, OUTPUT);
   // Set the LED pin as an output
   digitalWrite(PA15, HIGH);
   // Set the LED pin high
}

void loop()
{
   // We are not doing anything in the loop!
}
```

Experiment 3 - LED with Changing Blink Rate

```
void setup()
{
   pinMode (PA15, OUTPUT);
   // Set the LED pin as an output
}
```

```
void loop()
{
   for (int i=100; i<=1000; i=i+100)
   {
       digitalWrite(PA15, HIGH);
       delay(i);
       digitalWrite(PA15, LOW);
       delay(i);
   }
}
```

Pulse-Width Modulation with analogWrite()

List of analog output (PWM) pins commonly used on the Blue Pill:

1. PA0 (Timer2 Channel 1)
2. PA1 (Timer2 Channel 2)
3. PA2 (Timer2 Channel 3)
4. PA3 (Timer2 Channel 4)
5. PA6 (Timer3 Channel 1)
6. PA7 (Timer3 Channel 2)
7. PB0 (Timer3 Channel 3)
8. PB1 (Timer3 Channel 4)
9. PB6 (Timer4 Channel 1)
10. PB7 (Timer4 Channel 2)

List of digital output pins available on the Arduino Uno:

1. Digital Pins 3, 5, 6, 9, 10, and 11: These pins support PWM functionality and can be used for analog output via PWM.

Experiment 4 - Fading LED

```
void setup()
```

```
{
   pinMode (PB0, OUTPUT);
   //Set the LED pin as an output
}

void loop()
{
  for (int i=0; i<256; i++)
  {
     analogWrite(PB0, i);
     delay(10);
  }
  for (int i=255; i>=0; i--)
  {
     analogWrite(PB0, i);
     delay(10);
  }
}
```

Reading Digital Inputs

List of digital input pins commonly used on the Blue Pill:

1. PA0 - PA15 (Port A, Pins 0-15)
2. PB0 - PB15 (Port B, Pins 0-15)
3. PC0 - PC15 (Port C, Pins 0-15)

List of digital input pins available on the Arduino Uno:

1. Digital Pins 0 to 13: These pins can be used as digital input or output pins. Digital Pins 0 and 1 are also connected to the hardware serial interface (RX and TX), respectively.
2. Digital Pins A0 to A5: These pins can be used as digital input or output pins, in addition to their analog input functionality.

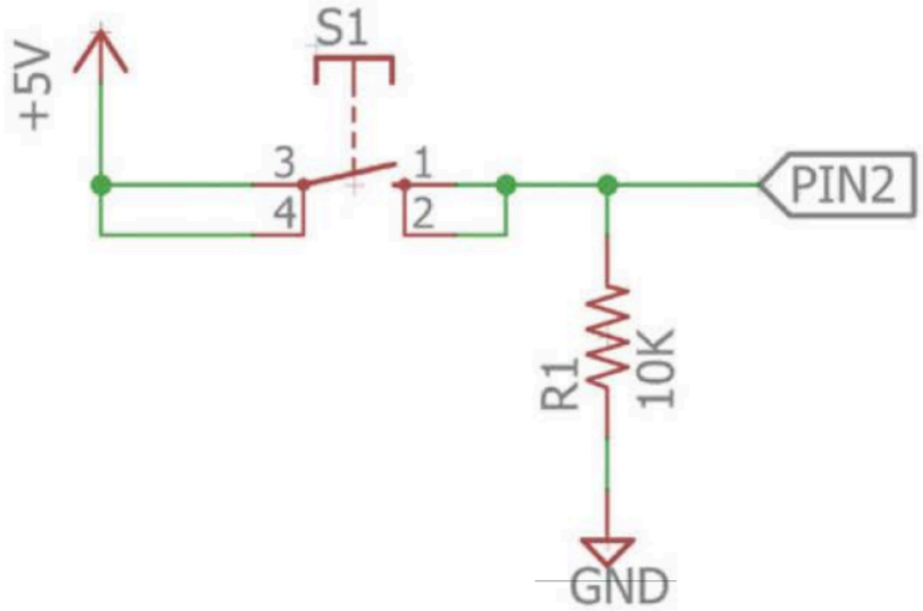

Figure 2-5: Pushbutton input with pull-down resistor schematic

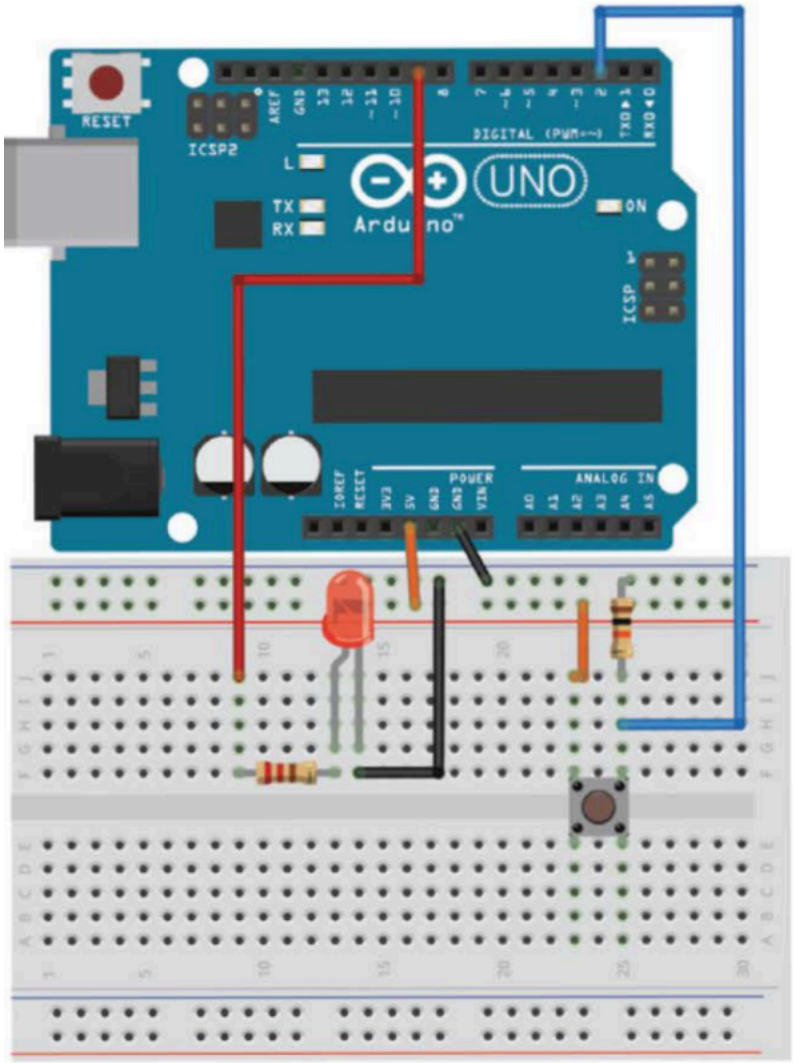

Figure 2-6: Wiring an Arduino to a button and an LED

Experiment 5 - Simple LED Control With a Button

```
const int LED=PB0;
// The LED is connected to pin 9
const int BUTTON=PC15;
// The Button is connected to pin 2

void setup()
{
   pinMode (LED, OUTPUT);
   // Set the LED pin as an output
```

```
   pinMode (BUTTON, INPUT);
   // Set button as input (not required)
}

void loop()
{
   if (digitalRead(BUTTON) == LOW)
   {
      digitalWrite(LED, LOW);
    }
    else
    {
      digitalWrite(LED, HIGH);
    }
}
```

Course Plan & Teachers

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