Trinket M0 Using Circuit Python

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TechAhoy Project

What is a Tomato Timer?

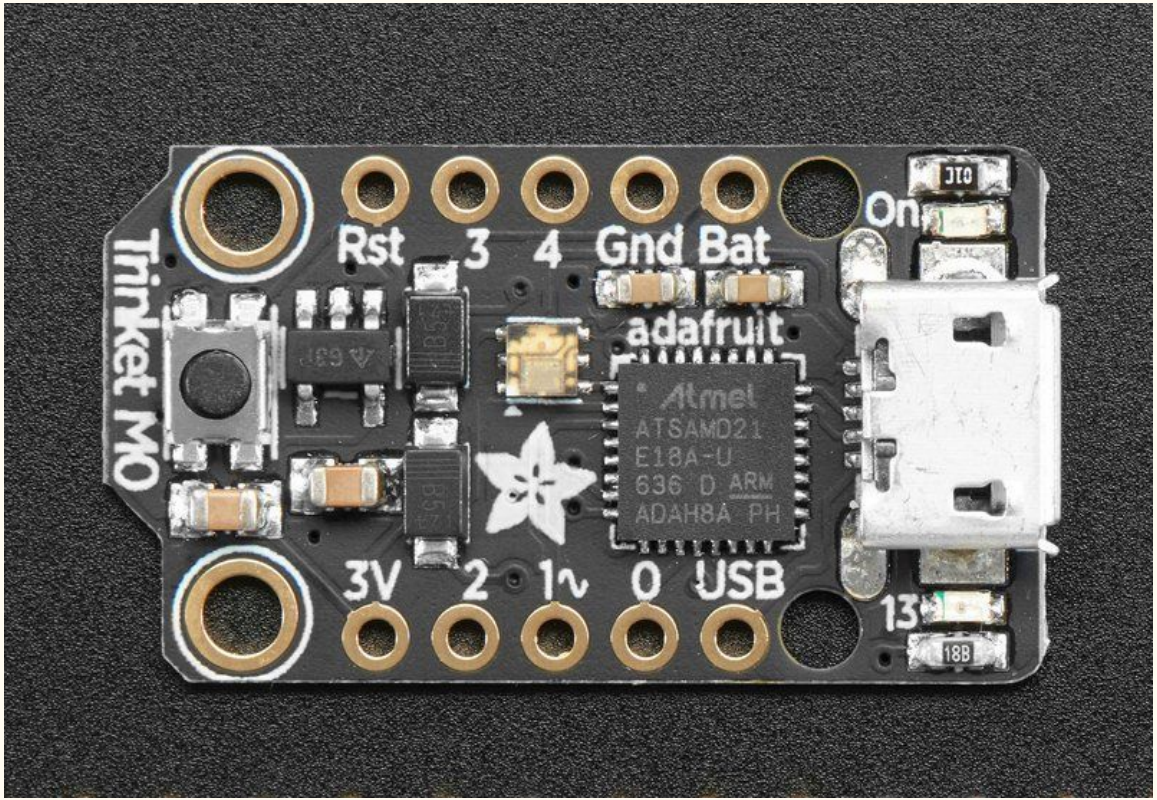
- Productivity Tool Used by Engineers
    - 25 minutes of work
    - 5 minutes of rest.

Materials

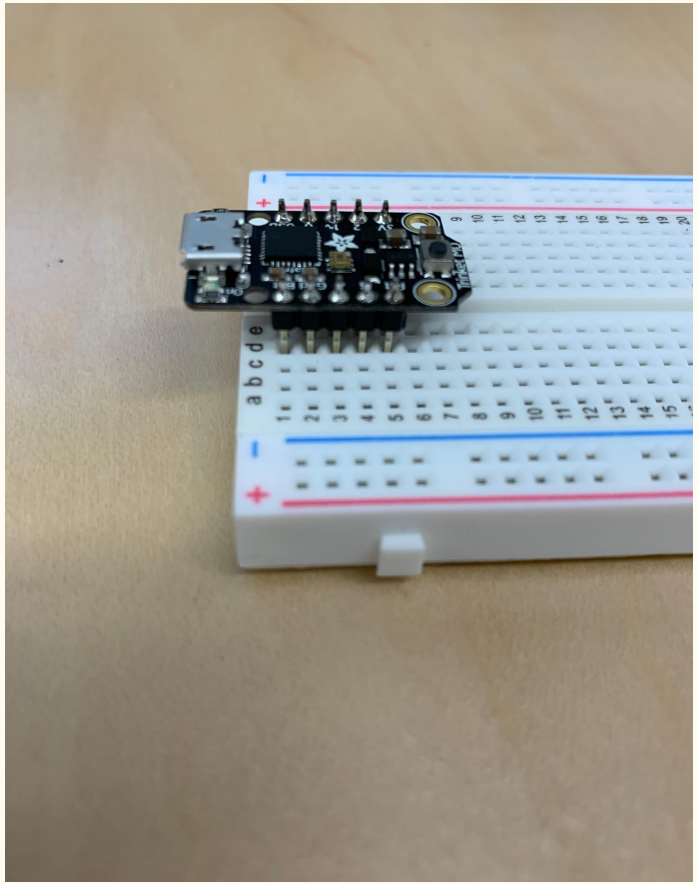
All available at TechAhoy!

- Trinket M0
- 5 LED Strip
- Breadboard (for prototyping)
- Header Pins
- Push Button Switch
- 2 Male Jumper Cables
- 3 Alligator Clips
- Micro USB Data Cable

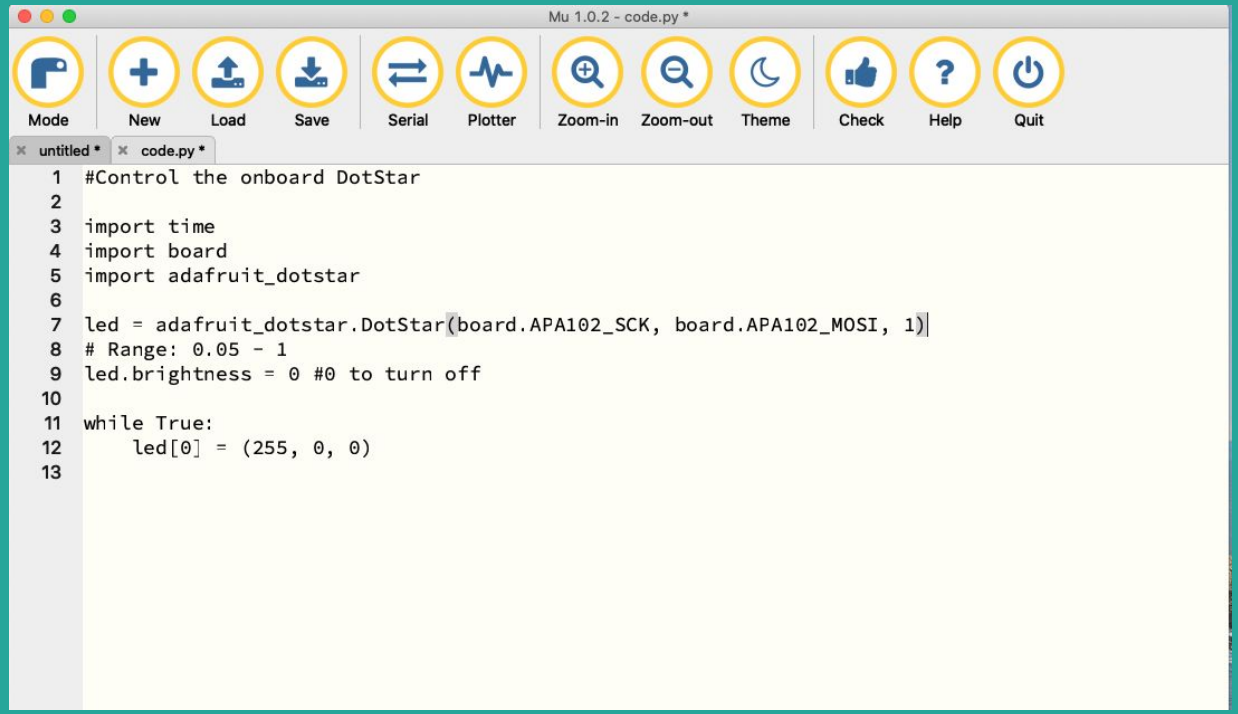
Trinket M0


Trinket M0
Rst
3
4
Gnd
Bat
On
adafruit
Atmel
ATSAMD21
E18A-U
636 D ARM
ADAH8A PH
3V
2
1
0
USB
13

Bread Board



Introduction to Software

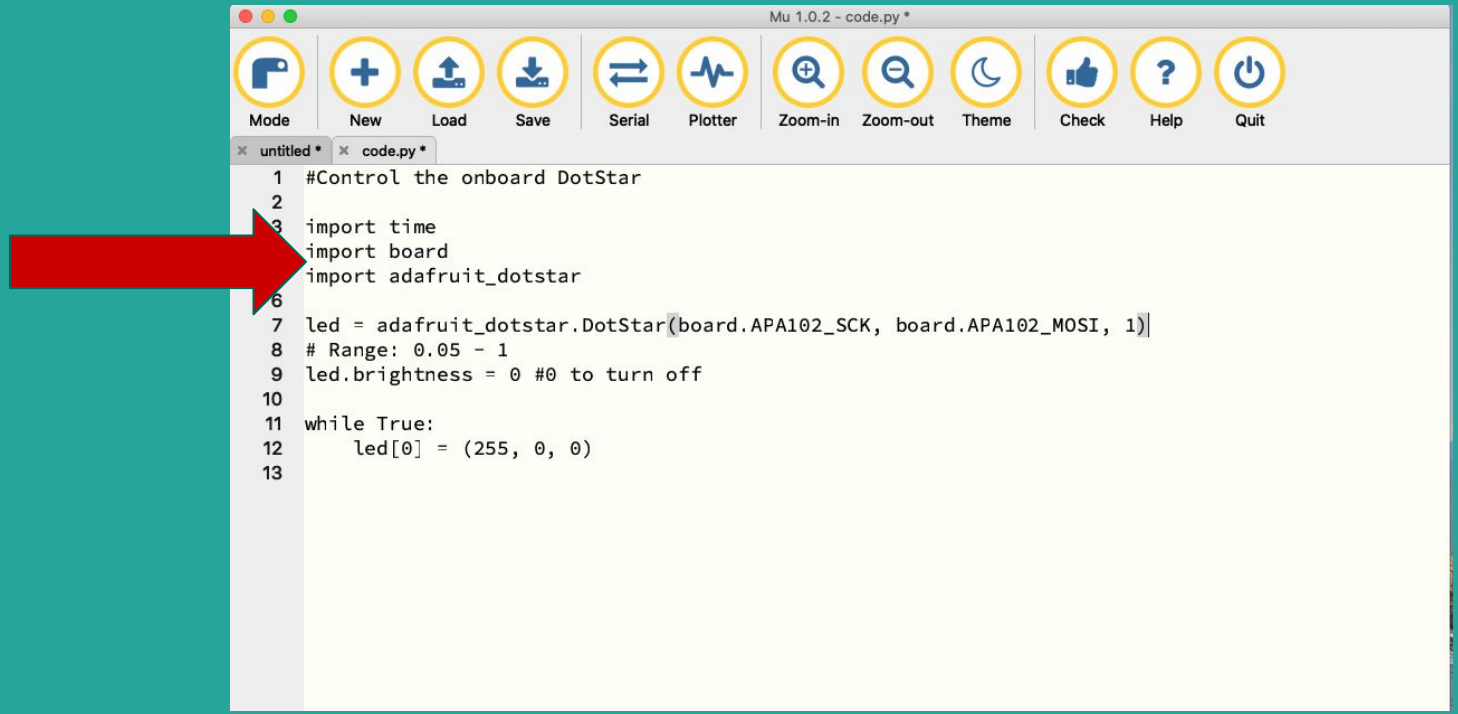


Turquoise: (19, 84, 78)

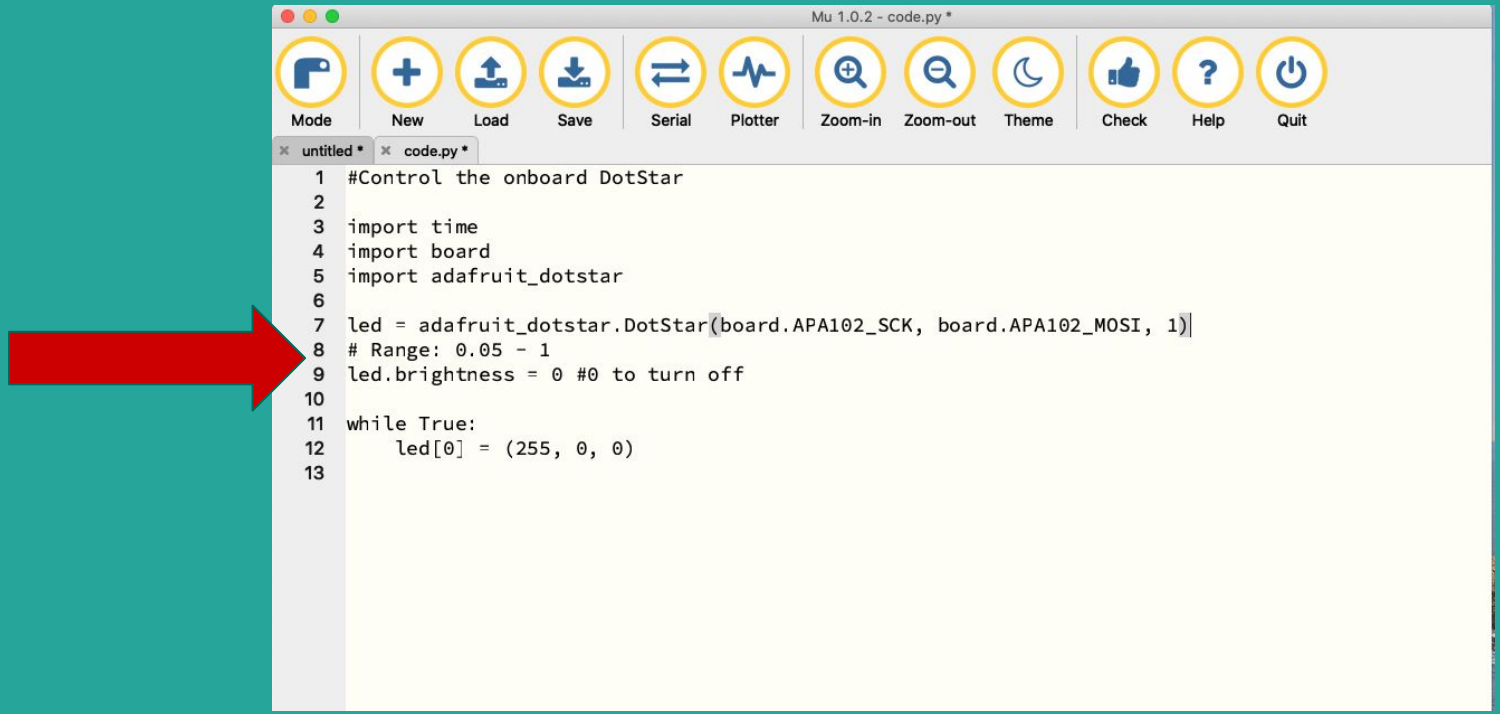
Coral: (100,50,31)

Fuchsia: (255, 0, 255)

IMPORTS


Mu 1.0.2 - code.py *
Mode
New
Load
Save
Serial
Plotter
Zoom-in
Zoom-out
Theme
Check
Help
Quit
untitled *
code.py *
#Control the onboard DotStar
import time
import board
import adafruit_dotstar
led = adafruit_dotstar.DotStar(board.APA102_SCK, board.APA102_MOSI, 1)
# Range: 0.05 - 1
led.brightness = 0 #0 to turn off
while True:
led[0] = (255, 0, 0)

SETUP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5 import adafruit_dotstar
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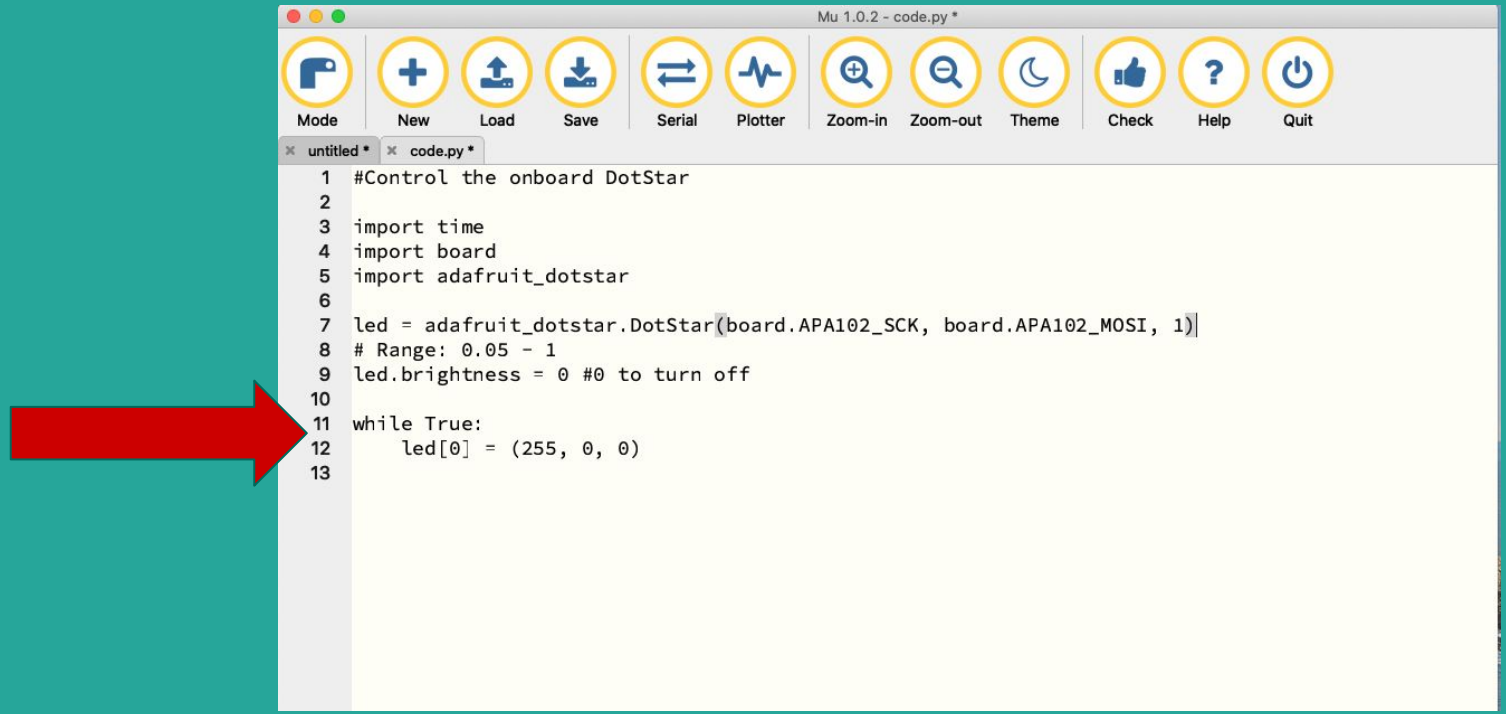
7 led = adafruit_dotstar.DotStar(board.APA102_SCK, board.APA102_MOSI, 1)
8 # Range: 0.05 - 1
9 led.brightness = 0 #0 to turn off
10
11 while True:
12 led[0] = (255, 0, 0)
13

THE LOOP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9 led.brightness = 0 #0 to turn off
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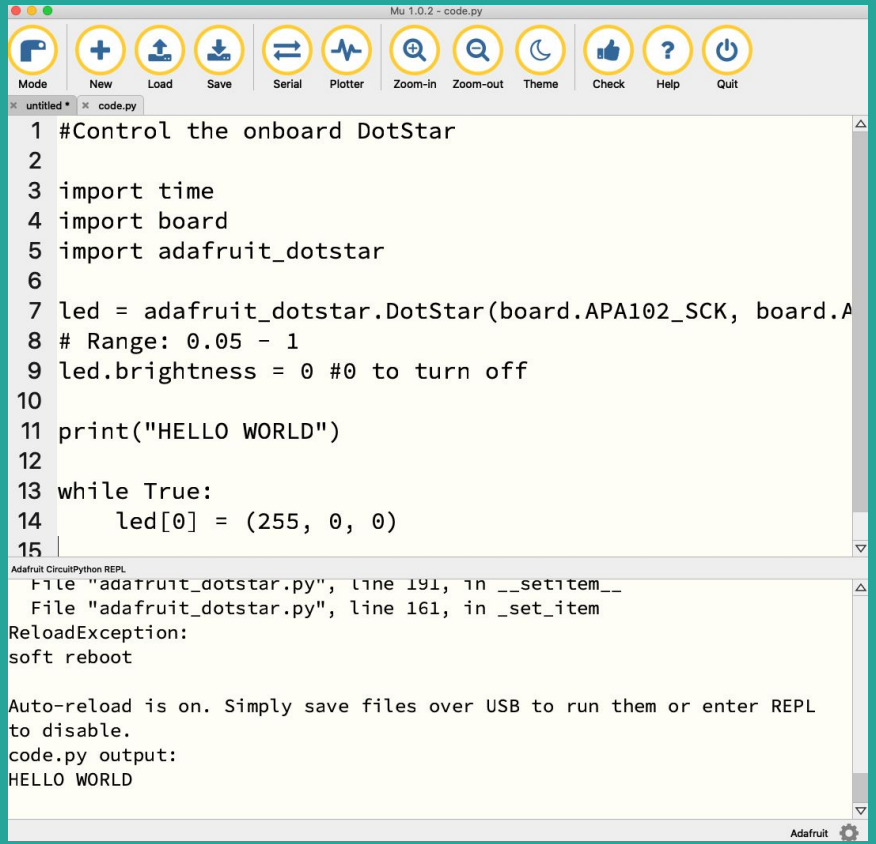
12 led[0] = (255, 0, 0)
13

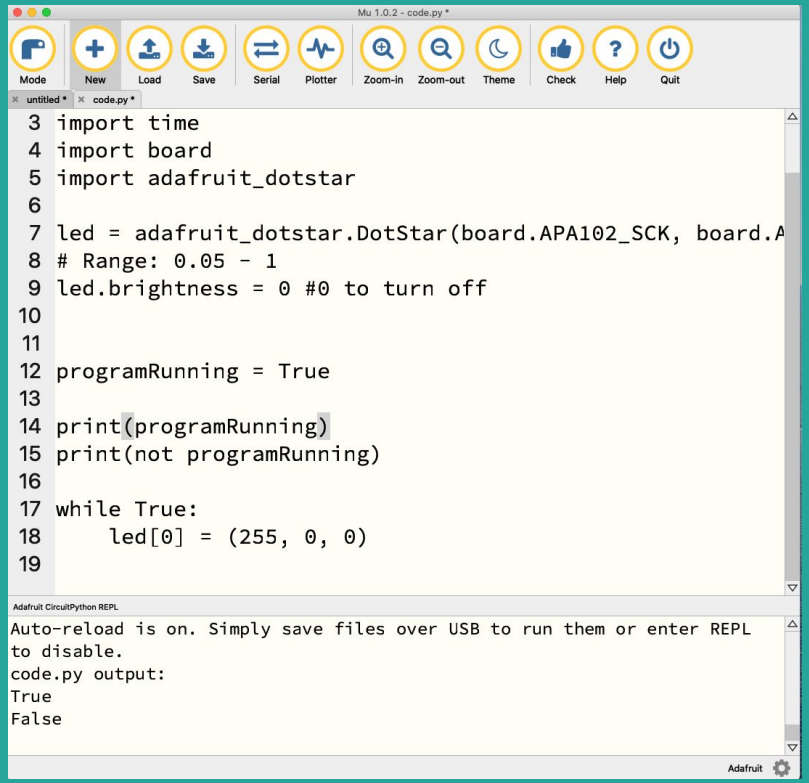
Hello World Program



Boolean Variables

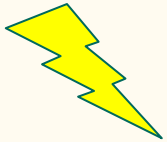
Boolean variables can be thought of as switches:

- On/Off
- 1/0
- True/False



Small Steps

When starting a new project, it is generally a good idea to start with the smallest problem.

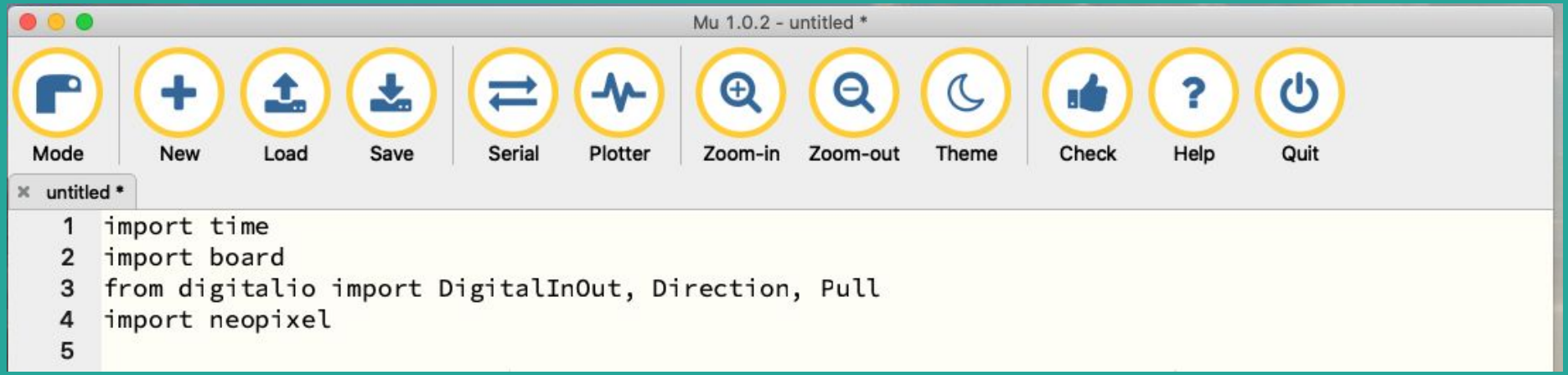


Challenge:
Blink Chip's DotStar
Using time.sleep()

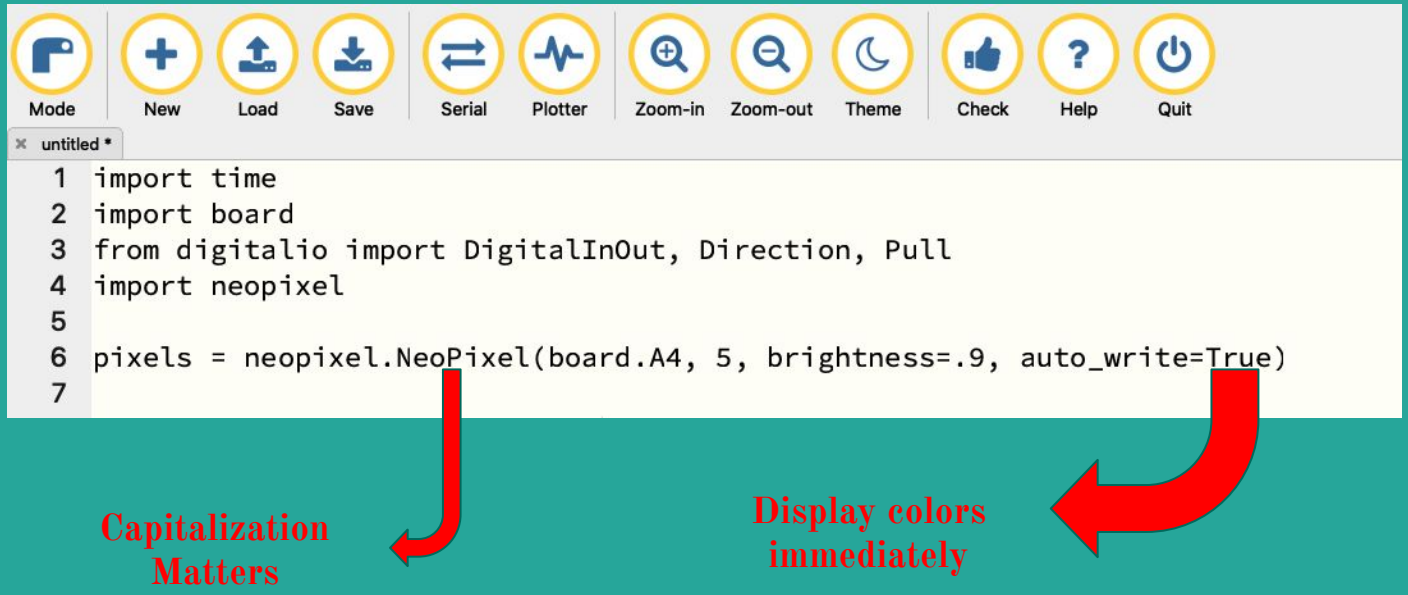
Engineering Problem

Program chip to light one LED every 5 mins. After 25 minutes, create a 5 minute resting pattern.

Important Imports



Hardware Setup



WIRE THIS!

1) Attach alligator clips to the wires of the led strip

2) Connect Information Wire to Pin 4

3) Connect Power Wire to 3V

4) Connect Ground Wire to Gnd

An Array is a List of Data

pixels[3] = (100,0,0) makes the 4th LED red!

Challenge:
Light all of the pixels in the strip

Introducing the
FOR LOOP


```
14
15 for pixel in range(0,5):
16     print(pixel)
17
```

Challenge:
Modify This Code to Light Strip

Button Time

```
13 pixels = neopixel.NeoPixel(board.A4, 5, brightness=.1, auto_write=True)
14
15 button = DigitalInOut(board.A3)
16 button.direction = Direction.INPUT
17 button.pull = Pull.UP
18
```

WIRE THIS!

1) Have the button straddle the divider.

2) Connect top left leg to A3

3) Connect bottom right leg to Gnd

LOOP

```
13 pixels = neopixel.NeoPixel(board.A4, 5, brightness=.1, auto_write=True)
14
15 button = DigitalInOut(board.A3)
16 button.direction = Direction.INPUT
17 button.pull = Pull.UP
18
19 while True:
20     buttonUp = button.value
21     buttonDown = not buttonUp
22     print(buttonDown)
23     time.sleep(3)
```

Introducing the
IF STATEMENT

```
19 while True:
20     buttonUp = button.value
21     buttonDown = not buttonUp
22     if buttonDown:
23         print(buttonDown)
24     time.sleep(.2)
25
26
```

CHALLENGE

Light the first led if button is down.

CHALLENGE

Light all the pixels when button is down.

CHALLENGE

Delay the lighting of each led by 2 seconds.