

ENGR 3421: ROBOTICS I

GPIO

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Outline

Python Review

PWM

Motor Driver



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Variables

- a variable can store anything: number, list, object,...
- Use "=" to feed contents to a variable



Conditions

- Use a boolean condition for your loop.
- `" > "`, `" <= "`, `" == "`, `" != "`
- `"and"`, `"or"`, `"not"`, `"is"`



Assignment Hints

- 1 "while" loop takes care of things happened in 0.02 seconds.
- Either set the LED brightness with a specific duty cycle or make it a constant.
- Read [gpiozero](#) documentations, implement some [recipes](#).



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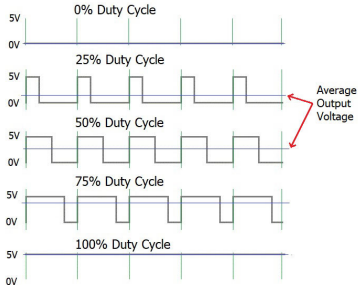
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Pulse Width Modulation



- Simulate analogue signal with digital signal.
- Frequency controls continuity.
- Duty cycle controls signal strength.



Hardware PWM & Software PWM

- Fully hardware PWM
 - The most accurate and possibly the most flexible.
 - Only available on GPIO 12/18 or GPIO 13/19.
- DMA (Direct Memory Access) timed PWM.
 - Intermediate accuracy but not flexible.
 - Available on all GPIO pins.
- Software timed PWM.
 - The timing accuracy will vary but very flexible.
 - Available on all GPIO pins.
 - Not good for servos.
- May require installation of [pigpio](#) library.



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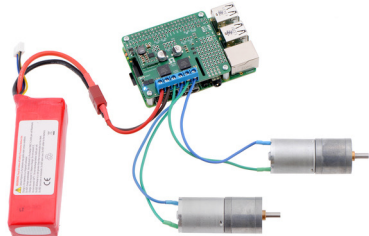
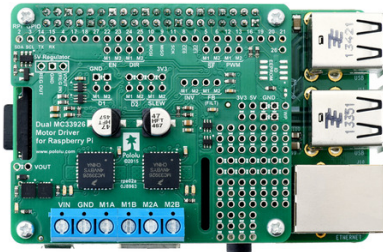
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Pin Mappings

item 11	item 12	item 13
item 21	item 22	item 23

