GPIO Memory game!

Today we're going to learn about:

- GPIO outputs
- GPIO inputs
- Random numbers & lists in Python
- Github!

The Game

This game is similar to the Simon game. We'll use 3 LEDs and the program will display a random sequence that the user has to repeat using buttons.

First, lets get the code

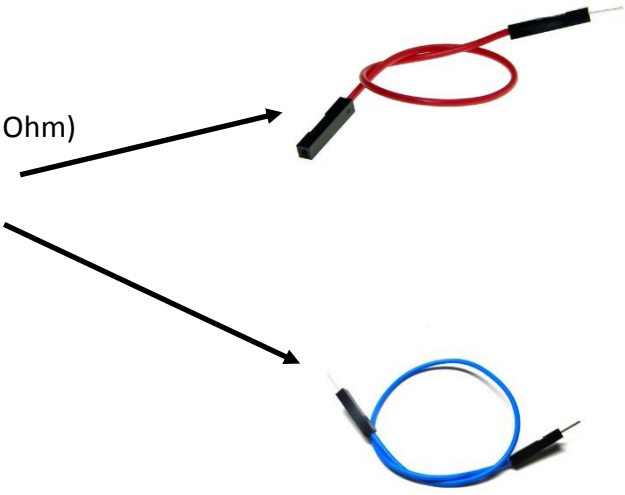
Go to https://github.com/coderdojo-newtampa/pi-gpio-memory

The README page on github has the instructions on how to get the code.

Wiring

Here's what we need:

- 1 breadboard
- Raspberry Pi with wifi adaptor
- 3 LEDs
- 3 buttons
- 3 resistors (could be 1k Ohm, 470Ohm, 220 Ohm)
- 7 male-female jumper wires
- 3 male-male jumper wires



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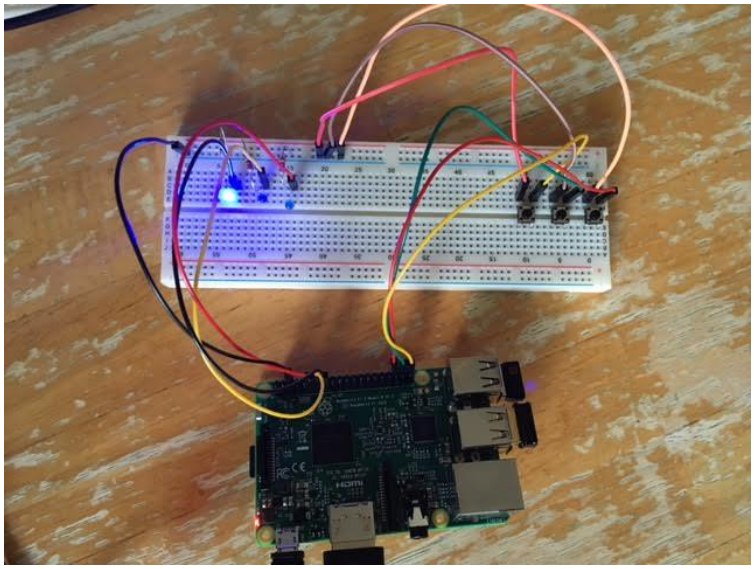
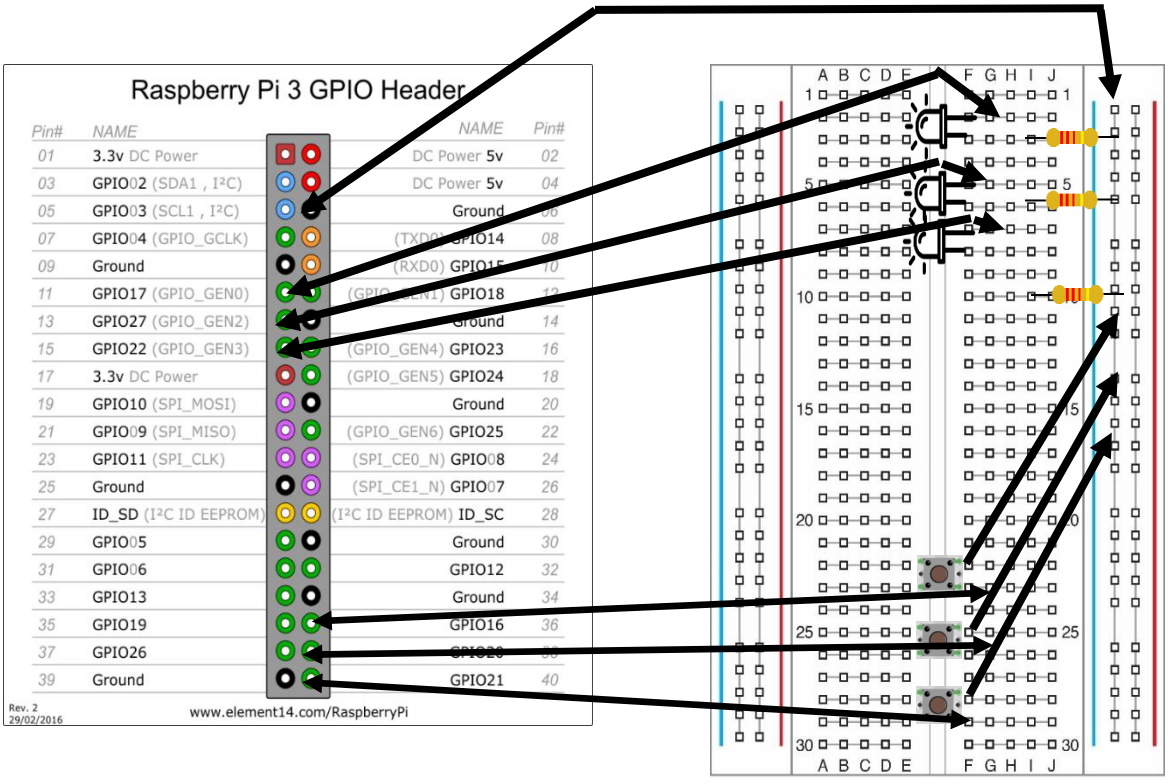
Here’s what we’re going to build!

LEDs connected to GPIO 17,27,22

Buttons to GPIO 16,20,21





Remember, LEDs connect to ground on the short/bent end

Let’s test

To test your wiring, run these programs

To just test the LEDs

```
cd pi-gpio-memory/src/test
python ledtest.py
```

You should see the lights turn on in different patterns

To test the lights and the buttons

```
cd pi-gpio-memory/src/test (same dir)
python buttontest.py
```

If you push a button, the corresponding LED should light up. If these programs don’t work, we have an issue with the wiring!

The Game code

```
cd pi-gpio-memory/src/
```

```
idle3 memorygame.py
```

Add this code at the end of the file

```
setup()
animate(7, 0.1)

while not gameOver:
    time.sleep(0.5)
    ledSequence.append(random.choice( [led1, led2, led3] ))
    display()

    for led in ledSequence:
        button = readInput()

        if (led == button):
            blink([button], 0.5, 0.2)
        else:
            blink([button], ledWait, 0.1)
            gameOver = True
            animate(3, 0.3)
            break

print("Your score is [%d], thank you for playing" % (len(ledSequence)-1))
gpio.cleanup()
```

To run the game, type:

```
python memorygame.py
```