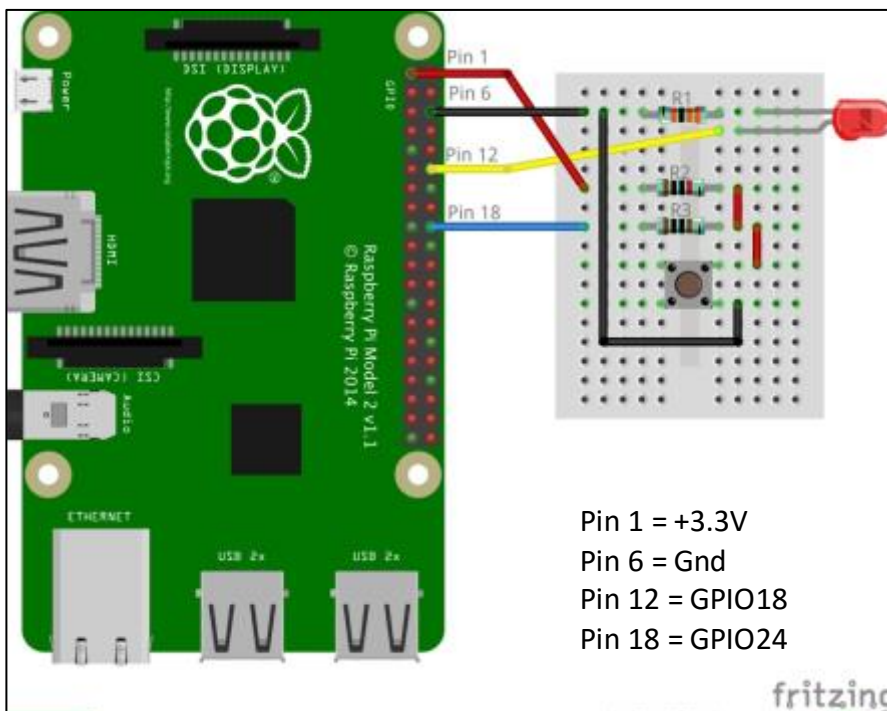


SCRATCH 1.4 – GPIO Exercise – Switching LED



Components:

R1 – Resistor 330 ohms
R2 – Resistor 10K ohms
R3 – Resistor 1K ohms
LED
Switch
Breadboard
Connecting wires

Assemble the components:

Ensure the LED is connected the correct way, long pin + to Pin 12.

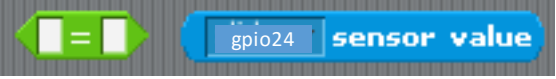
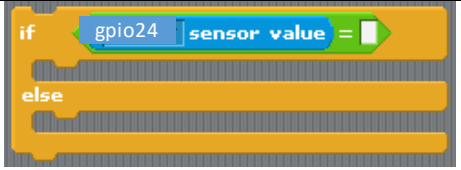



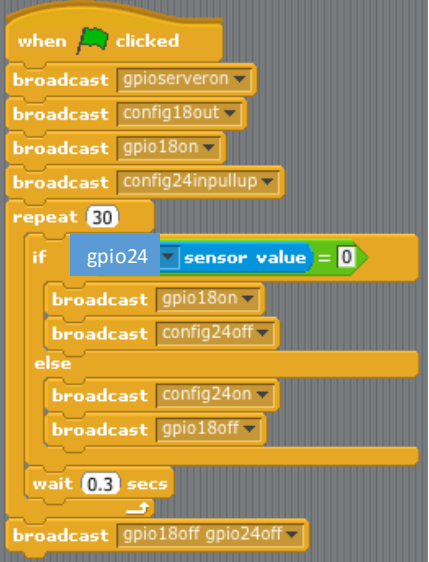
Test the circuit: Use a spare connector

1. Connect between left hand side of R2 and the long lead of the LED. The LED should light. Remove connector; the test is complete.

Coding – Open SCRATCH 1.4 on the Raspberry Pi

2. Open the Edit menu and start the GPIO Server

3. The code blocks used for controlling the GPIO are all actioned using the Control broadcast block. For example to turn on the GPIO server:	
4. To select and switch on a GPIO output: read the caption as: configure GPIO 18 as an output gpio18 switch on [Options: on, high, off, low]	
5. Bring it all together as a script. Run this code and the LED should come on Challenge: How do you switch the LED off? Try it!	
6. Accept a command from a switch to activate the LED. Add the following block:	

<p>Read the block as follows: Configure GPIO 24 as an input with a pull up resistor circuit.</p>	
<p>7. The action of setting an input enables the use of control, sensing and operator blocks.</p> 	
<p>Read the code as follows: Monitor the switch (gpio24) if it is true (pressed = 0) then do something, else do something else.</p>	
<p>8. What to do if true: Light the LED and stop monitoring the switch: Switch gpio 18 on and stop monitoring input from switch config 24 off.</p>	
<p>9. What to do if false: Wait for an input from the switch config 24 on, don't switch on the LED gpio 18 off</p>	
<p>10. Bring it all together in a loop:</p> <p>The program is designed to run for a specific time then stop and switch off.</p>	
<p>11. The final code:</p> <p>After 30 loops switch off the gpio18off and gpio24off</p> <p>Test the code and press the switch to control the LED.</p>	
<p>12. Challenge: How do you adjust the time of the flashing LED?</p> <p>13. Create and insert code to show a flashing LED sprite on the stage when the switch is depressed.</p>	

