Intro to Circuits

Advanced group: Week 1 exercises



Aims:

- Let's wire up a house!
- Smart home
- Interconnected sensors
- Google home/Alexa
- Multipurpose buttons





The plan:

- Week 1 Arduino, battery, breadboard and lights
- Week 2 LDR, motion sensor, gas sensor
- Week 3 LDR, motion sensor, gas sensor
- Week 4 LDR, motion sensor, gas sensor / Door lock servo, keypad
- Week 5 Door lock servo, keypad
- Week 6 Door lock servo, keypad





- Use functions as much as possible, much easier and tidier to work with
- Try to keep the virtual wires as tidy as possible, and colour code them \odot
- Test as much of the code and circuit as possible use the serial monitor and Serial.print()
- Ask questions if you're stuck [©]



BRONZE Challenge:

Add the following components to your circuit 9 volt battery Arduino Bread board 3 LEDs

2 bulbs





BRONZE Challenge:

- Connect the power terminals of the battery into the VIN and GND pins of the Arduino
- The 5V and GND pin from the Arduino to the power rails of the power power rails of the power power power rails of the power pow



- Add the 3 LEDs to the breadboard, change the colours to red, orange and green
- Connect the Cathode to the ground pin and the Anode to the Digital Pin for Arduino:



BRONZE Challenge:

- Finally, connect up the two bulbs, connect terminal 1 to the ground power bar on the breadk
- Connect terminal 2 on bulb 1 to pin A3, connect terminal 2 on bulb 2 to pin A4.
- Are there any issues with the way we have wired anything up?





SILVER Challenge:

Let's begin programming... Make sure you are using the text editor (not blocks) – Arduino C is a lot more flexible than blocks.

Define all the OUTPUTs for the 3 LEDs and 2 bulbs, using the pins on the bronze challenge

Make all the lights turn on and off at the same time, with a 5 second delay.



GOLD Challenge:

Create a two functions for each LED and Bulbs: One to turn the light on One to turn the light off.

Create a program which flashes each light in sequence by calling these new functions e.g.

onRedLED(); delay(500); offRedLED(); onOrangeLED(); delay(500); offOrangeLED(); onGreenLED(); delay(500);



Introduce a variable for each LED to save the state of whether it is on or off.

- Add the ability to check whether LEDs are currently on or off (you could use the serial monitor).
- If you turn on a certain light in the house, it means that you have moved rooms. So, create a program which turns off other lights.



Thank You

