

Corridor Light

Pre-requisite

Complete tutorials on Pelican crossing.

Task

Create a simulation of a corridor light that only activates if it is dark outside and a button is pressed. The light will stay on for 30 seconds before turning off.

Initially you will create a basic sensing system that turns on the light if it is dark and then enhance this to include the switch and the time out.

What is required?

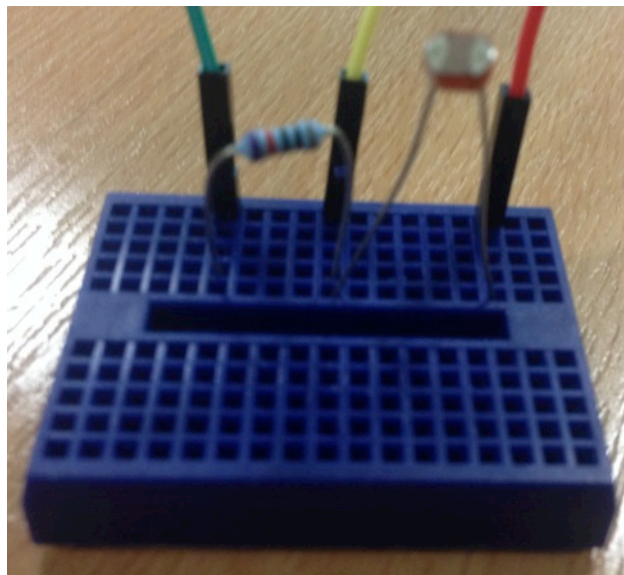
- Raspberry Pi
- PiFace Digital
- ADC Pi v2 from AB Electronics
- Mini-Breadboard
- LDR
- 10k Resistor
- 150R Resistor
- Yellow LED
- Switch (You could use switch on PiFace)
- 5 Wires to connect Breadboard to PiFace and ADC
- adcRead.py

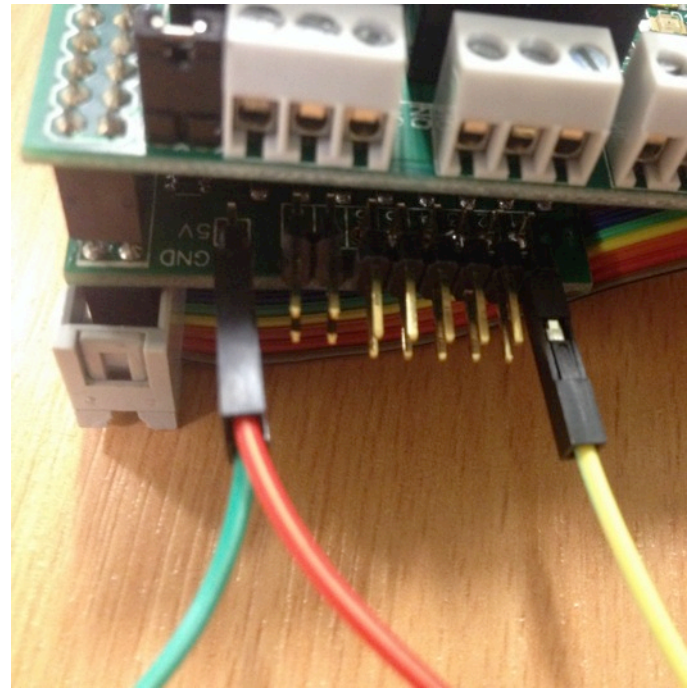
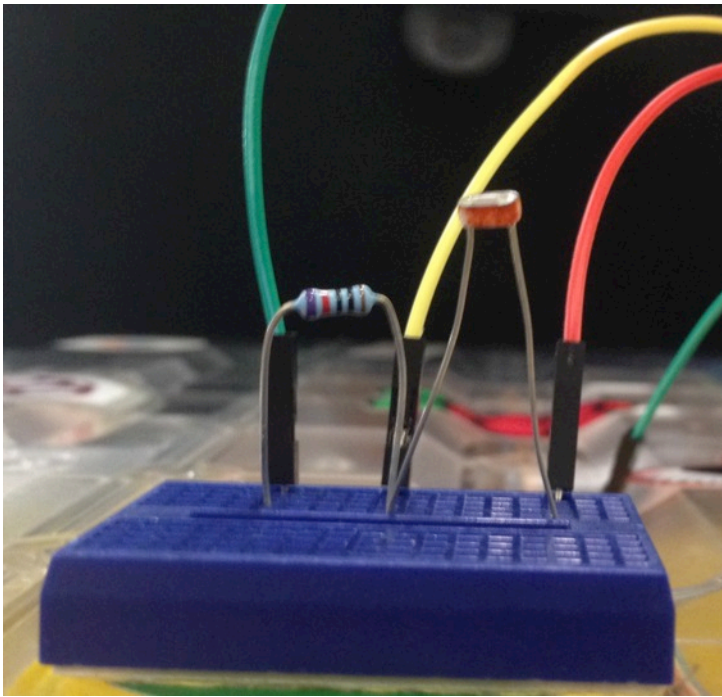
Stage 1 - Reading values from ADC

Build the circuit shown below on a breadboard. **Your circuit should ensure the flow of electricity between 5V and GND so ensure that the LDR and resistor are in series and connected.**

| | | | | |
|-----|--|---------|--|---------|
| 5v | | ADC1 | | GND |
| LDR | | LDR | | |
| | | 10K Res | | 10k Res |

The diagram above represents the breadboard. Each cell represents a hole in the board. Connect up the components as shown. All holes on a column are connected, except across divide.





You have been provided with a library for reading the values from the ADC. This library will allow you to use/view the pure value, the resistance value or the temperature reading from thermistor (we'll use this later).

Lets have a go at retrieving the resistance from the LDR.

1. Put adcRead.py in the same folder as you plan to save your code to (This is important as python needs to find the file)
2. Input the following code into IDLE3 and run it:

```
import adcRead
import time
import pifacedigitalio #Imports the piface library
pifacedigital = pifacedigitalio.PiFaceDigital() #Sets up PiFace
adcreader = adcRead.adcRead()
while True: #Starts constant loop
    print(adcreader.getResistance(1)) #Prints the resistance from the LDR
    time.sleep(1)
```

3. Cover the LDR with your hand and notice how the resistance value drops.

Simple Corridor Light

Build the following circuit on the other half of the breadboard and connect to the PiFace board as shown.

| | | | |
|----------|--|----------|--------|
| 5v | | | OUT0 |
| 150R Res | | 150R Res | |
| | | YELL + | YELL - |

The diagram above represents the breadboard. Each cell represents a hole in the board. Connect up the components as shown. All holes on a column are connected, except across divide.

Using the code above as a starting point, write a piece of code that turns on an LED when it's dark. You can modify the resistance range of decide how dark you want it to be before activating light.

Improved Corridor light

How can you improve this system further? Hint: You could incorporate a switch and a timeout.

