IoT Security and Privacy

Assignment 5 - Raspberry Pi Controlling Sensors

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Question:
In this assignment, students are required to use at least one sensor on raspberry pi.

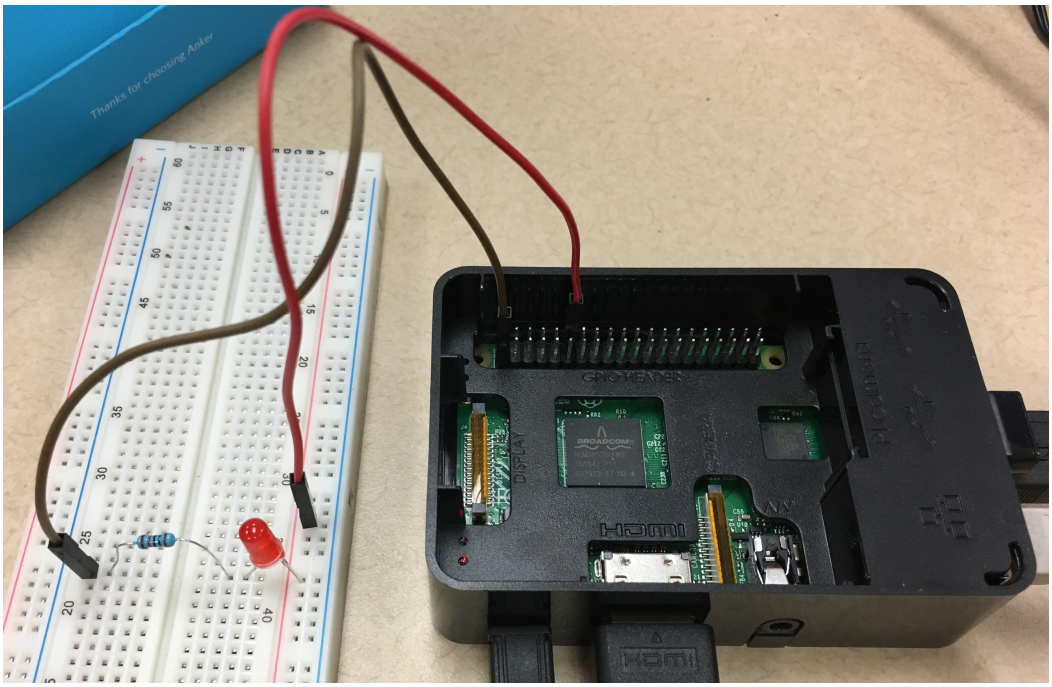
Please refer to [1] for use of raspberry pi and [2] for various sensor manuals. Search “manual” in the page for manuals of the sensors.

Q1. Introduce what the sensor(s) does. (1 point)

Answer: The sensor used in this assignment is an LED (Light Emitting Diode) which displays light when the power is connected and displays nothing when there is no power connected.

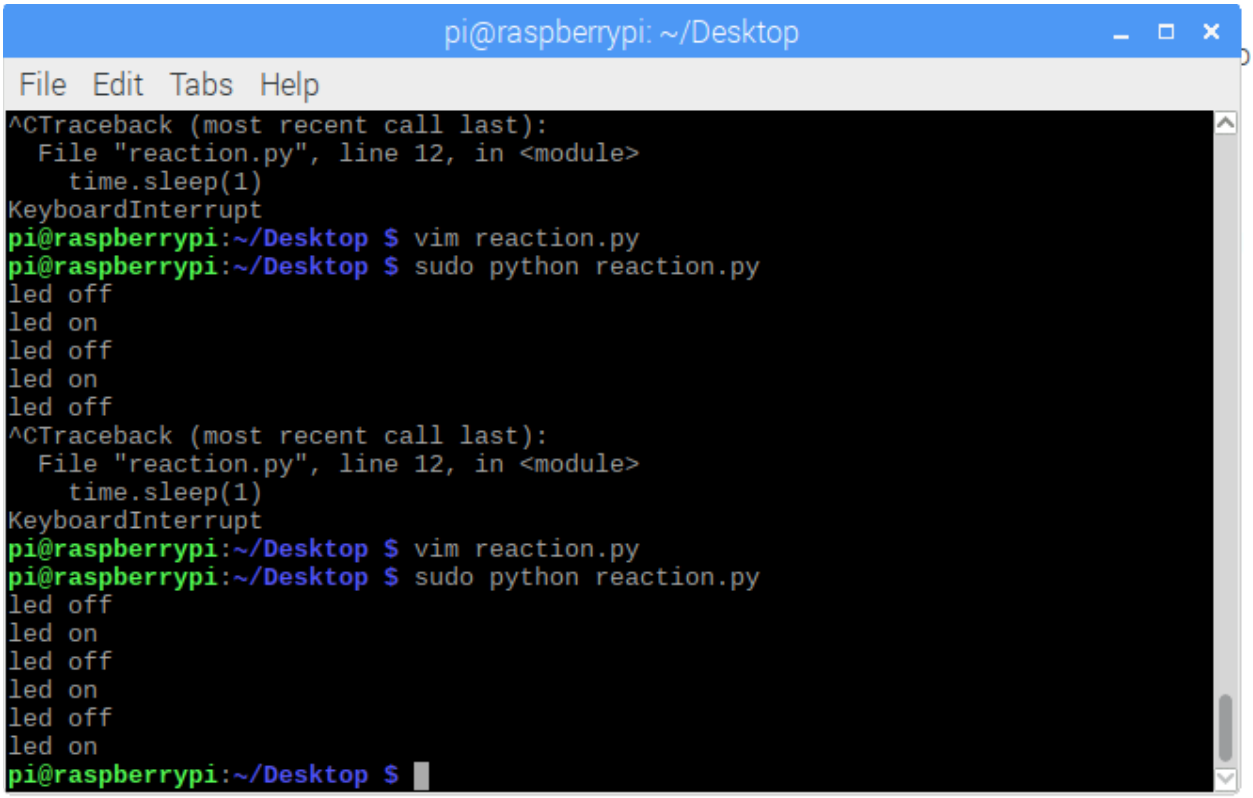
Q2. Include a photo of raspberry pi with the connected sensor. Explain how the sensor is connected to GPIO pins or the board of raspberry pi. Any accessories such as cameras are considered as sensors. (1 point)

Answer: The LED is connected to the power pin (Pin #1) with a 1000 Ohm resistor in between. GPIO pin 18 (Pin #12) is also connected to the LED in order to allow for manual control of when the LED is on/off. The connections can be seen in the picture below.



Q3. Include the results of your experiments controlling or communicating the sensor, for example, using screen shots. (4 points)

Answer: The results of this experiment are that the LED turned on and off for 3 cycles as shown in the screenshot below. Since the LED displays a visual result, it is not possible to show this cycle except through feedback from the code. However, we can assure the reader that a visual verification was conducted.



Q4. Include the code for controlling or communicating the sensor below. (4 points)

Answer:

```
# reaction.py
import RPi.GPIO as GPIO
import time

GPIO.setmode(GPIO.BCM)
GPIO.setwarnings(False)
led = 18
GPIO.setup(led, GPIO.OUT)

i = 0
while (i < 3):
      GPIO.output(led, GPIO.HIGH)
      print “led off”
```

```
        time.sleep(1)
        GPIO.output(led, GPIO.LOW)
        print “led on”
        time.sleep(1)
        i += 1

GPIO.cleanup()
```