**RASPBERRY PI 3 B V 1.2 GPIO MOTION SENSOR**

**Raspberry pi 3 Introduction:**

Raspberry is a single board computer developed in UK by Raspberry pi foundation to promote the basics of computer science in schools and universities. The architecture depicts the models A , B , A+ , B+. The Ethernet adapter is connected to an addition USB port and USB port is connected directly to system on chip (SOC). The [Broadcom](https://en.wikipedia.org/wiki/Broadcom) BCM2835 SoC used in the first generation Raspberry Pi is somewhat equivalent to the chip used in first generation [smartphones](https://en.wikipedia.org/wiki/Smartphone" \o "Smartphone) . The Raspberry Pi 3 uses a Broadcom BCM2837 SoC with a 1.2 GHz 64-bit quad-core [ARM Cortex-A53](https://en.wikipedia.org/wiki/ARM_Cortex-A53) processor, with 512 KB shared L2 cache. It consists of 40 GPIO pins with different specifications as in its architecture.

**PIR sensor Introduction:**

A **passive infrared sensor** (**PIR sensor**) is an electronic [sensor](https://en.wikipedia.org/wiki/Sensor) that measures [infrared](https://en.wikipedia.org/wiki/Infrared) (IR) light radiating from objects in its field of view. They are most often used in [PIR-based motion detectors](https://en.wikipedia.org/wiki/Passive_infrared_sensor#MOTION). Its major application is for detection input zone of the [burglar alarm control panel](https://en.wikipedia.org/wiki/Burglar_alarm_control_panel). If motion is detected, the relay opens, triggering the alarm. The pins followed with the PIR motion sensor consists of a VCC, an Output and a GND(ground). Our bodies generate infrared heat and as a result this gets picked up by the motion sensor. The sensor outputs a 5V signal for a period of one minute as soon as it detects the presence of a person. It offers a tentative range of detection of about 6-7 m and is highly sensitive. When the PIR motion sensor detects a person, it outputs a 5V signal to the raspberry pi through its GPIO. And we define what the raspberry pi should do as it detects an intruder through python coding. Here we are just printing: “Intruder detected”.

**Bread board Introduction:**

The bread board consist of the 4 layers. In the first and the fourth layer it consist of two segments comprising of 5 : 5 pins each where the first line defines the positive terminal and the second line of pins defines the negative terminal. When a GND is to be setup it can be in either of the terminal and should not crossover with the other terminal. VCC should be connected to the positive terminal on the breadboard. The second and the third terminal consists of 5 : 65 pin sets where every column carries the same voltage point. If a pin has to be connected at the same voltage point it has to be connected parallel.

**Recommended Equipment:**

For this assembly the required materials are mentioned as below:

1. Raspberry pi kit
2. PIR motion sensor (Infrared sensor)
3. An LED(short length is negative terminal and long length is positive terminal)
4. 220 Ohm resistor(colour code from red to brown)
5. Jumper wires both M to M and M to F
6. Breadboard

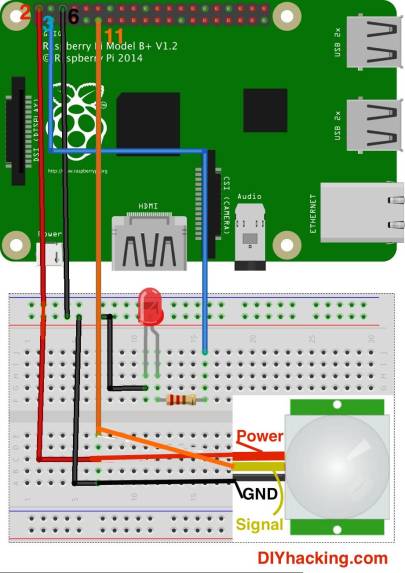
**Building the circuit/ Connection setup:**

The method of assembling the sensor circuit is as steps below:

1. Connect the Raspberry Pi GPIO pin 2 to the positive terminal of the breadboard (row 1 segment 1 section 2 pin 1)
2. Connect the adjacent pin of the positive terminal (row 1 segment 1 section 2 pin 2) to the VCC of the motion sensor (*pin 1*).
3. Connect the Raspberry Pi GPIO pin 6 to the negative terminal of the breadboard (row 2 segment 1 section 2 pin 4)
4. Connect the adjacent pin of the negative terminal (row 1 segment 1 section 2 pin 1) to the GND of the motion sensor (*pin 3*).
5. Connect the Raspberry Pi GPIO pin 7 to the voltage point on the breadboard (row 1 segment 3 pin 25)
6. Connect the voltage point pin of the breadboard (row 2 segment 3 pin 25) to the output of the motion sensor (*pin 2*).
7. Connect the Raspberry Pi GPIO pin 3 to the negative terminal of the resistor (brown colour code side)( row 5 segment 2 pin 30).
8. The resistor must be connect from colour code red to brown from row 5 segment 3 pin 26 to pin 30.
9. Connect the LED (row 3 segment 2 pin 25 (-ve) to pin 26 (+ve)) to the positive terminal of the resistor.
10. Connect the negative terminal of LED (row 3 segment 2 pin 25) to negative power point on the bread board (row 2 segment 1 section 4 pin 1).
11. Connect the Raspberry Pi to the system using VNC /remote connection.[*using Pi’s private Ip*]
12. Execute the code in Raspberry Pi within the directory where the python script is written. [*python program\_name.py* ]
13. Motion gets detected within the range of 6 to 7m.

Here in this connection pin 2 acts as a power(voltage point) and pin 3 denotes the output, pin 6 acts as ground and pin 7 acts as an input feed from the sensor. The output of the sensor will be given as an input to the Raspberry GPIO pins. Further this can be expanded by adding a temperature sensor to detect the temperature or a motion capture sensor to capture the motion detected, etc.

**Circuit Diagram:**

****