Name - Rutuja Manoj Kasar
class - TE - div - A
Roll no - 65

Assignment - 4.

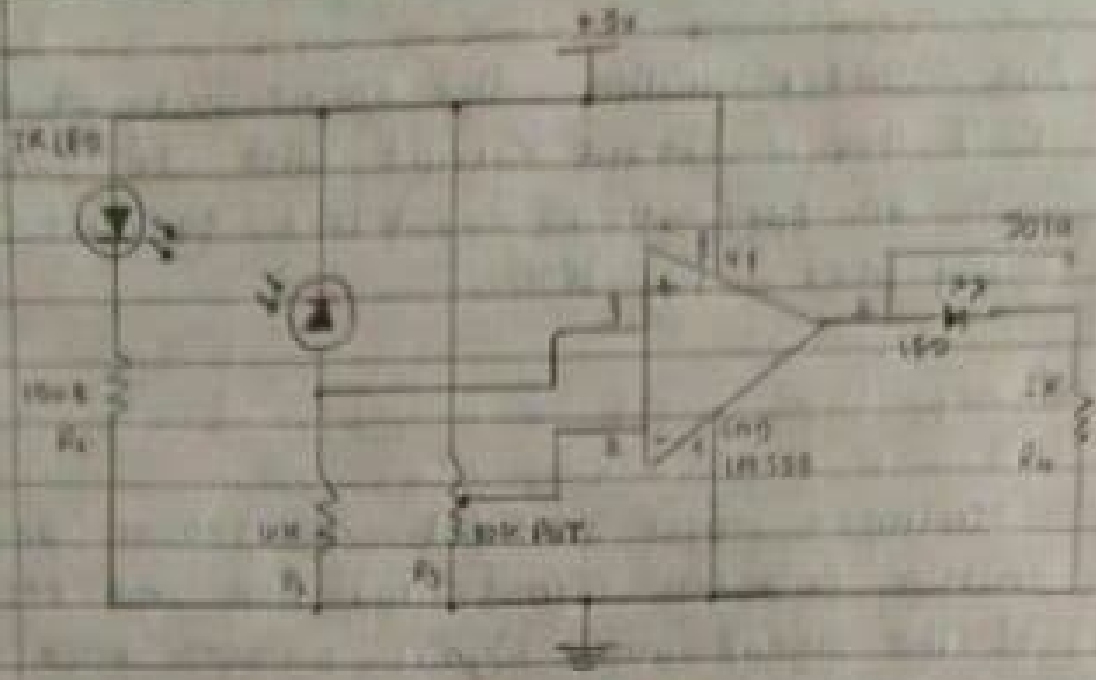
Aim - Understanding connectivity of Raspberry Pi / Beagle board ckt. with IR sensor write an application to detect obstacle and notify user using LED's.

Theory – Infored sensor IR sensor works by emitting infrared signal / tradition and receiving of signal when signal bounces back team any obstacle in other words, IR sensor works by continuously sending signal & continuously receive signal, comeback by bouncing an any obstacle in way.

Components - IR Sensor →

1. Emitter → This component continously emits the Infrared signal
2. Receiver → It waits for signal which is bounced back by obstacle is deducle by sensor
3. Ground → Ground/ negative point.
4. Voltage → Input 3.3V.

IR Sensor Fig.1



Circuit diagram of IR Sensor fig 1

Objectives -

We will creating a circuit using following components to detect obstacle.

1. Raspberry Pi 3
2. IR sensor
3. 1 LED
4. 1 Register (330 Ω)
5. Few jumper cables
6. 1 Breadboard.

Part 1 - Connecting IR Sensor

1) Connect GPIO 17 from the Raspberry Pi to Breadboard (5a).
2) Connect OUT Pin of the sensor with the Breadboard (5c)
3) Connect GND with negative line on left side of breadboard.
4) Connect GND of the IR sensor to Breadboard (1sc)

5) Connect GND from Step 3 to Breadboard (ion)
6) Connect Vcc of the IR Sensor to Breadboard
7) connect 3v3 (Pin #1) to positive line on left side of the breadboard
8) Connect 3v3 (connected in Step 7) to the Breadboard (ion)

Now the circuit is complete and Sensor will detect the obstacle. It can be tested by putting anything in front of IR Sensor. On board LED will on if obstacle is put in front of the sensor, else it will be off.

Part 2 - Connecting LED
Objective is turn on the LED when obstacle is detected.
1) Connect GPIO 4 from the board to the Breadboard (row)
2) connect positive point of LED
3) connect negative point of LED
4) use resistor (330 Ω) to connect negative (row from Part 2 : Step 3) to the negative point of the LED (row)

Now we are ready to send signal based on input received from IR sensor to turn on / off the LED.

Part 3 - Code to connect IR Sensor I/P with LED Status.

```
from GPIO zero import LED
from signal import pause
import RPi.GPIO as GPIO
import time
GPIO.setmode(GPIO.BCM)
```

```
LED_PIN = 27
IR_PIN = 17

Indicator = LED(LED_PIN)
GPIO.setup(IR_PIN, GPIO.IN)

count = 1
while True:
    got_something = GPIO.input(IR_PIN)
    if got_something
        indicator.on()
        print("[:33] Got Something" format
                (count))

    else:
        indicator.on()
        print("[:>3] Nothing detected" format
                (count))

        count += 1
        time.sleep(0.2)
```

Part 4 - Executing code

1) Open terminal (on Pi itself or login through SSH login)
2) Navigate to directory where the above code is saved.
3) Types $ python3 ir_obstacle.py and press <enter> on terminal it will start printing the status based on conditions.

Conclusion -

Thus, we done connectivity of Raspberry - Pi / Beagle board circuit with IR Sensor. write application to detect Obstacle & notify user using LED's.

Understanding the connectivity of Raspberry Pi board with IR sensor.

Aim / objectives -

1. To understand the concept of proximity sensor
2. To interface proximity sensor with Raspberry Pi model.
3. To program the Raspberry Pi model to detect the nearest object using proximity sensor & given indication through led.

Software -

1. Raspbian OS (IDLE)

Hardware modules -

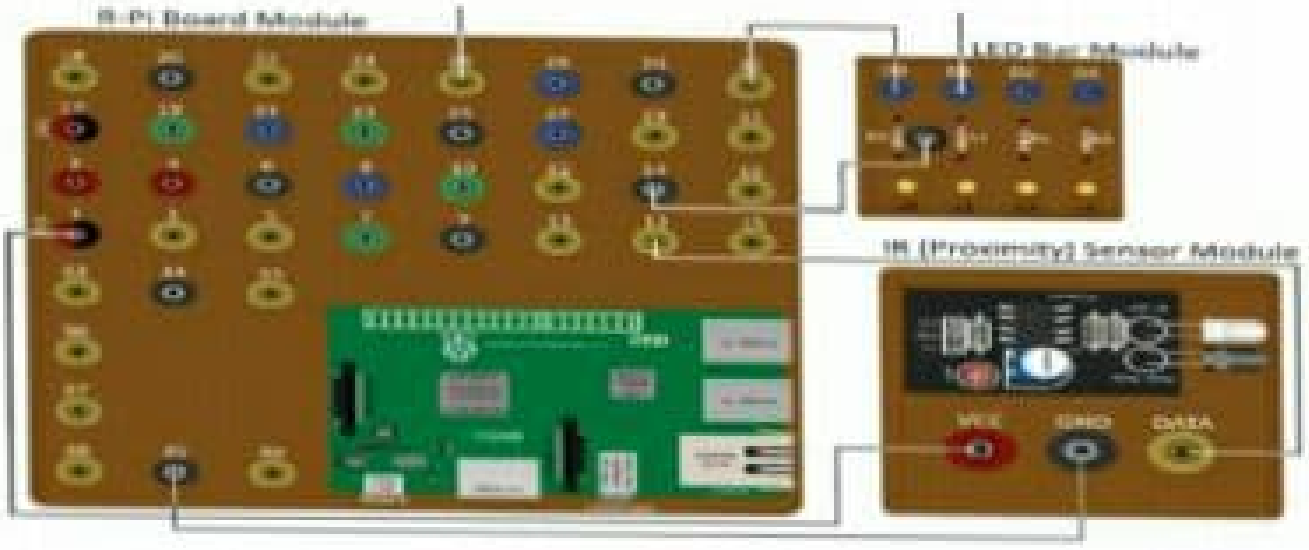
1) Raspberry Pi Board.
2) Proximity Sensor, Led, 330 ohm register
3) Monitor

Safety precautions -

1) First make all connections as per steps given below
1) Power Supply.


Proximity Sensor
Photo Diode
U1
O/P
O/P
GND
VCC
IR LED
IR Sensor

Interface diagram:



Interface diagram -

Steps for assembing circuit -

1) Connect the VCC pin of Proximity Sensor to 3.3 v (Pin) of Raspberry Pi Module
2) Connect the GND Pin of Proximity Sensor to GND Pin of Raspberry Pi Module
3) Connect the DATA Pin of proximity Sensor to Pin '13' of Raspberry Pi module 4) Connect the Do pin of LED bar to pin '28' of Raspberry Pi module.

5) Write the program as per the algorithm given below.
6) Save program
7) Run Code using Run module

Algorithm :

8) Import GPIO and Time library.
9) Set module i.e GPIO.BOARD.
10) Set GPIO Pin '13' as Input.
11) Set GPIO Pin '28' as output.
12) Read input from GPIO Pin '13'.
13) Store the input value in the variable 'i'.
14) If (i==1) then print the message as "object is detected" and make the LED ON.
15) If (i==0) then print the message as "no object detected" and make the LED OFF.

Observations -

See output on command prompt or python shell and check LED Status.