Experiment no :- 4

Aim :- Understanding the connectivity of Raspberry - Pi / Beagle board circuit with IR sensor.
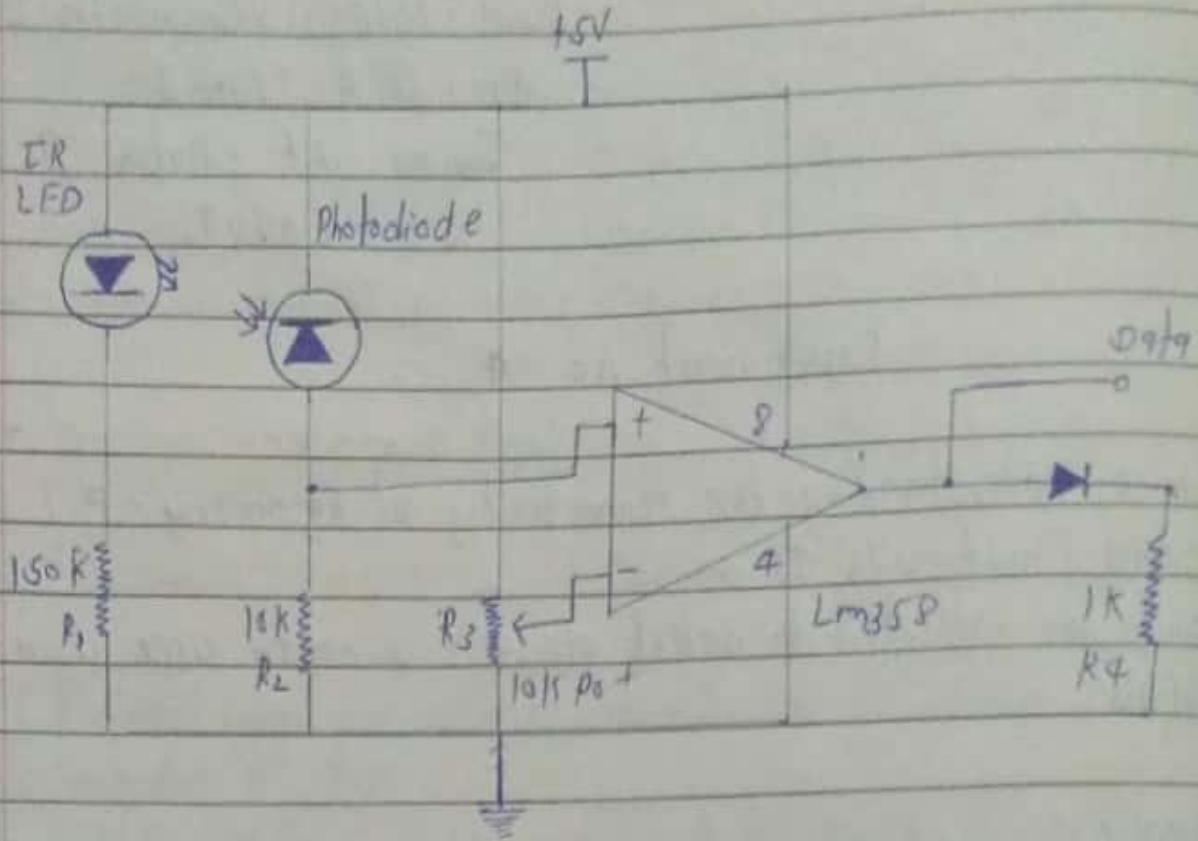Write an application to detect obstacle & notify user using LED's.

Theory :-

1 Emitter :- This component continously emits the signal
2. Receiver :- It waites for the signal which is bounced back by obstacle.
3. Indicator :- on board LED to signal if obstacle is deduced by the sensor.
4. output :- could be used as Input for further processing of the signal
5. Ground :- Ground / Negative point of the circuit
6. voltage :- Input 3.3V

objective :-
we will be creating circuit using following components
1. Raspberry Pi - 3
2. IR sensor
3. 1 LED
4. 1 register ($33\,\Omega$)
5. few jumper cables
6. 1 Breadboard.

+5V

IR
LED

Photodiode

Data

150 k
R₁

10 k
R₂

R₃

10/15 Po

+
8

4

Lm358

1K
R4

Circuit diagram of IR sensor.

Circuit :- To detect obstacles.

Part-1 :- Connecting IR sensor

IR sensor has 3 pins, viz, Vcc, GND & OUT we will use GPIo for receiving input from sensor.

1. Connect GPIo in form the Raspberry Pi to breadboard

2. Connect out pin of sensor with the breadboard.

3. Connect GND with negative line on left side of the breadboard

4. Connect GND of IR sensor to Breadboard

5. Connect GND from step 3 to breadboard

6. Connect vcc of the IR sensor to breadboard

7. Connect 3v3 (Pin #1) to positive line one left side of the breadboard.

8. Connect 3Vs to breadboard

Now circuit is completed & sensor will detect the obstacle. It can be tested by putting anything in front of IR sensor

Part 2 :- Connecting LED
objective is to turn on LED when obstacle is detected
1. Connected GPIO4 follow the board to the breadboard
2. Connect +ve point of LED to breadboard
3. Connect negative point of LED to the breadboard

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

Part 3 :-
code to connect IR sensor I/P with LED status

Part 4 :- Executing the code
- open terminal
- Navigate to directory where the above code is saved
- Type $python3 is obstacle.py & press enter

Conclusion :-
Thus, we done connectivity of Raspberry pi / Beagle board circuit with IIR sensor. write an application to detect obstacle & notify user using LED's.

IR Sensor Fig.1