

Assignment No. 5

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Title: Understanding connectivity of Raspberry Pi circuit with IR sensor. Write an application to detect obstacle and notify user using LEDs

Aim / Objectives:

- To understand concept of proximity sensor.
- To interface proximity sensor with Raspberry pi model.
- To program the Raspberry Pi model to detect nearest object using proximity sensor and give indication through led.

Software:

Raspbian OS / Tinkercad.

Hardware Modules:

- Raspberry Pi Board
- Proximity sensor, led, 330 ohm resistor
- Monitor

Theory:

- Proximity IR sensor is a small board containing an IR transmitting, photodiode, IR Receiver and some processing circuitry.
- This is a discrete sensor that senses when an object comes near to the sensor face.
- It works by detecting reflected light coming from its own infrared lights.
- By measuring the amount of reflected infrared

light & it can glow onboard led when it is directly front of it.

- In proximity, it consists of two leds, one is the transmitter (IR LED) and another is receiver.

- The IR led transmits infrared light signal which reaches all the object and reflects back.

- The Photo diode receives deflected light.
- This signal is then amplified & status of this signal is checked by microcontroller.

Steps for assembling circuit:

- Connect signal pin of proximity sensor to D2 of Arduino uno R3.

- Connect power pin of proximity sensor to 5V pin of Arduino uno R3.

- Connect GND pin of proximity sensor to GND pin of Arduino uno R3.

- Connect cathode pin of LEDs RGB to GND pin of Arduino uno R3.

- Connect positive terminal pin of piezo to GND pin of Arduino uno R3.

- Connect negative terminal of piezo to 12 pin of Arduino uno R3.

Procedure:

- Write program in cpp.

- Save program

- Run using run module.

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Observation:

- See output on tinkercad dashboard and also check LED status.

Conclusion:

We successfully learnt about connectivity of Raspberry-Pi board circuit with IR sensor & can be able to write an application to detect obstacle & notify user using LEDs.

Done
26/09/22