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Object Detector

Object detector using IR sensor

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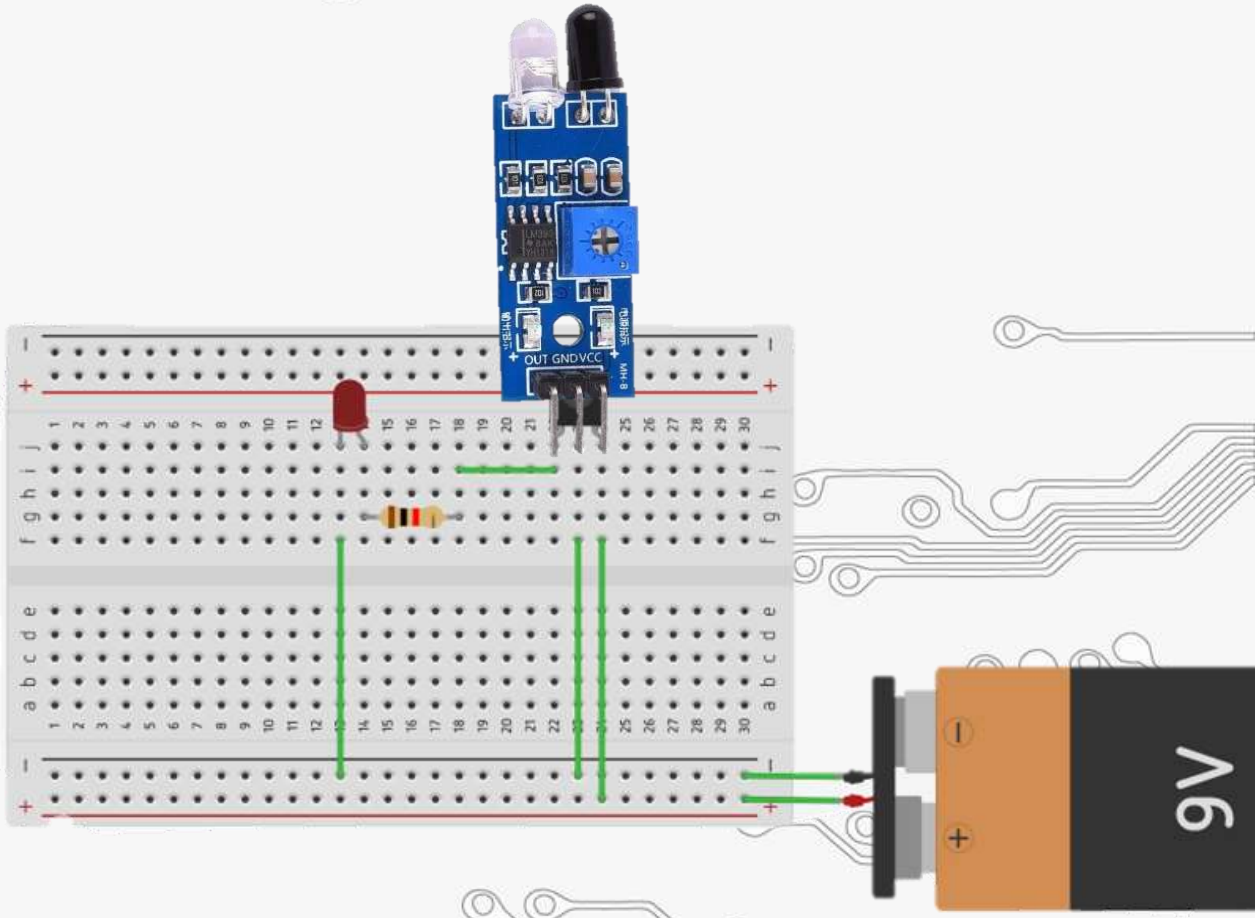
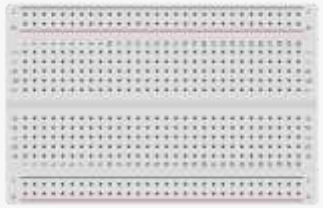
Introduction

Object detector



Required Components

- Breadboard
- IR Sensor
- LED
- Resistor
- Snap Connector
- Jumper Wires
- Battery 9v



Breadboard

IR Sensor

LED

Resistor

Snap Connector

Jumper Wires

Battery 9v

Infrared Transmitter-Receiver

- Infrared Transmitter is a light emitting diode (LED) which emits infrared radiations. Hence, they are called IR LED's. Even though an IR LED looks like a normal LED, the radiation emitted by it is invisible to the human eye.
- Infrared receivers are also called as infrared sensors as they detect the radiation from an IR transmitter. IR receivers come in the form of photodiodes and phototransistors. Infrared Photodiodes are different from normal photo diodes as they detect only infrared radiation.

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About Project

- An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion.
- These types of sensors measures only infrared radiation. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations.
- These types of radiations are invisible to our eyes that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED.
- The basic concept of an Infrared Sensor which is used as Object detector, is to transmit an infrared signal, this infrared signal bounces from the surface of an object and the signal is received at the infrared receiver.

Working of the Project

- In this project, the transmitter section includes an IR sensor, which transmits continuous IR rays to be received by an IR receiver module.
- An IR output terminal of the receiver varies depending upon its receiving of IR rays. Since this variation cannot be analyzed as such, therefore this output can be fed to a comparator circuit.
- Here an operational amplifier of LM358 is used as comparator circuit. When the IR receiver does not receive a signal, the potential at the inverting input goes higher than that non-inverting input of the comparator IC (LM358).
- Thus the output of the comparator goes low, but the LED does not glow. When the IR receiver module receives signal to the potential at the inverting input goes low. Thus the output of the comparator goes high and the LED starts glowing.

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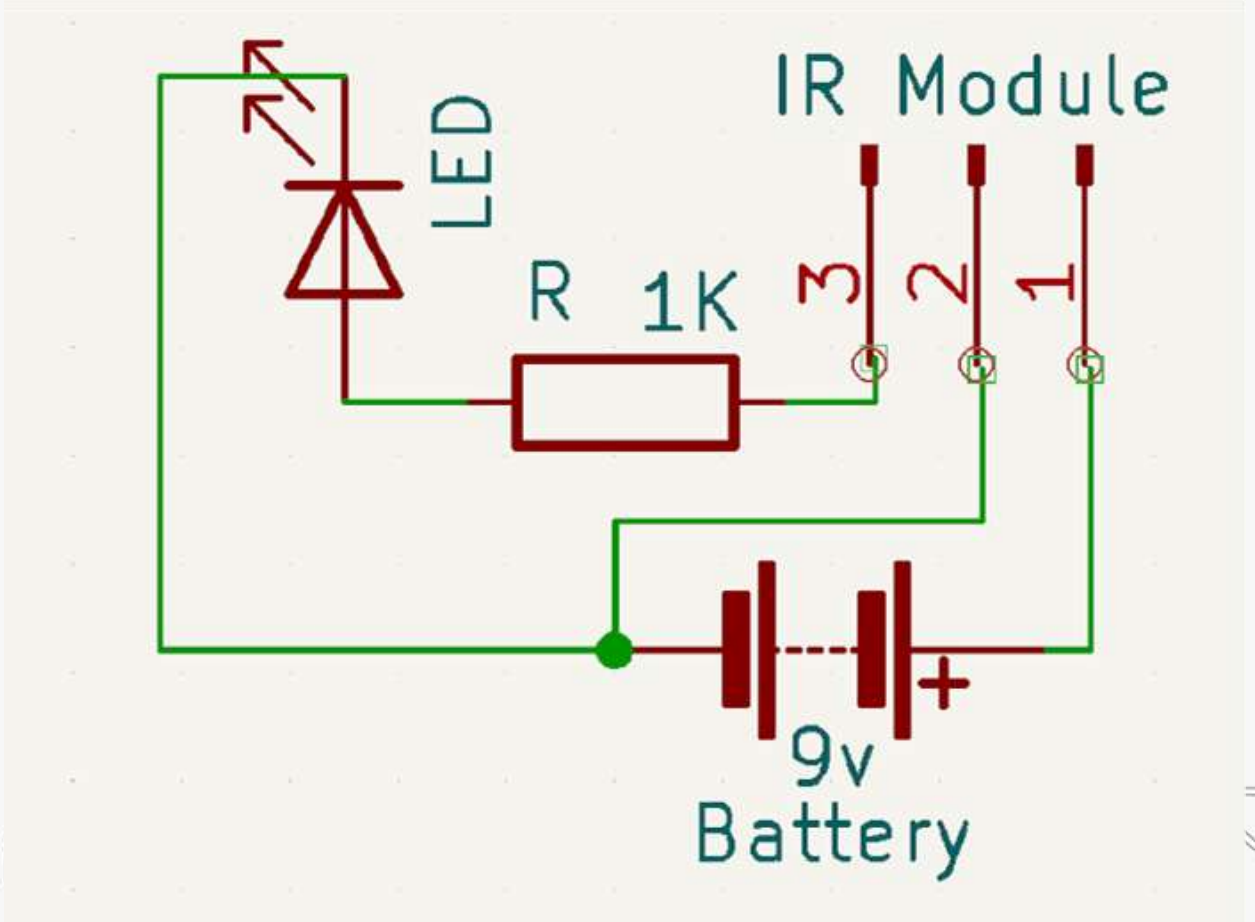
Procedure

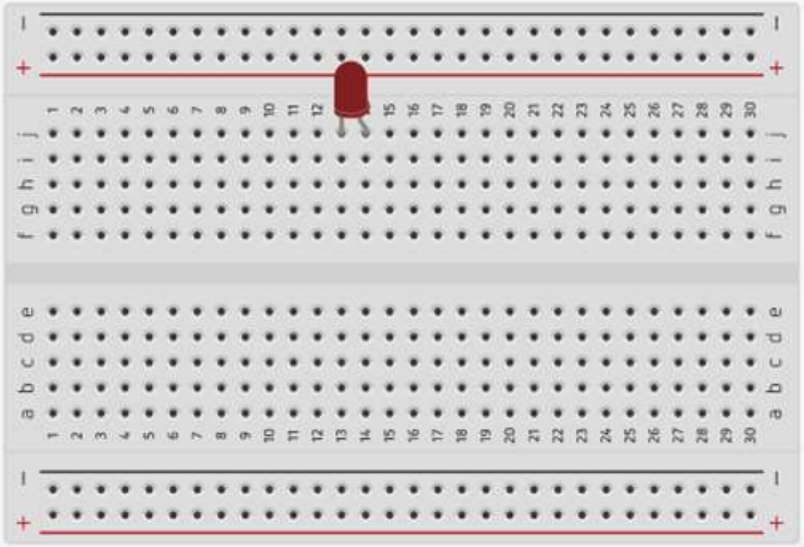
Connection Steps

Circuit diagram



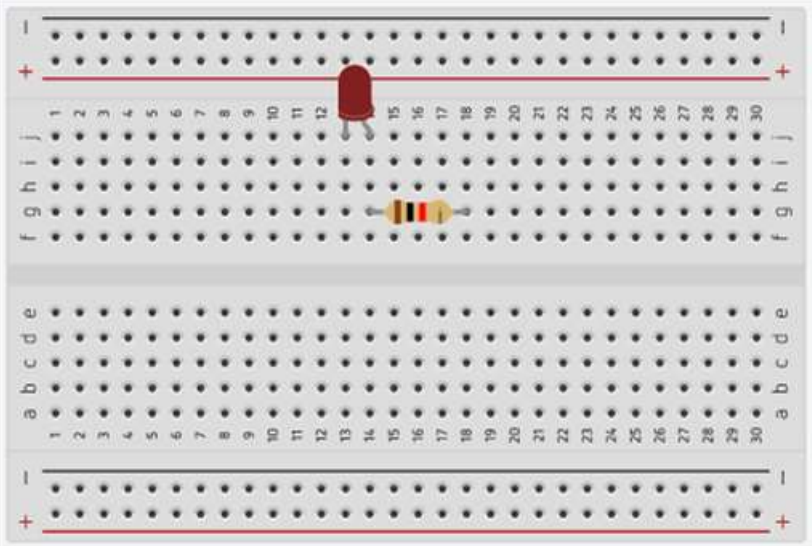
Connection Step 1

- Insert LED in bread board



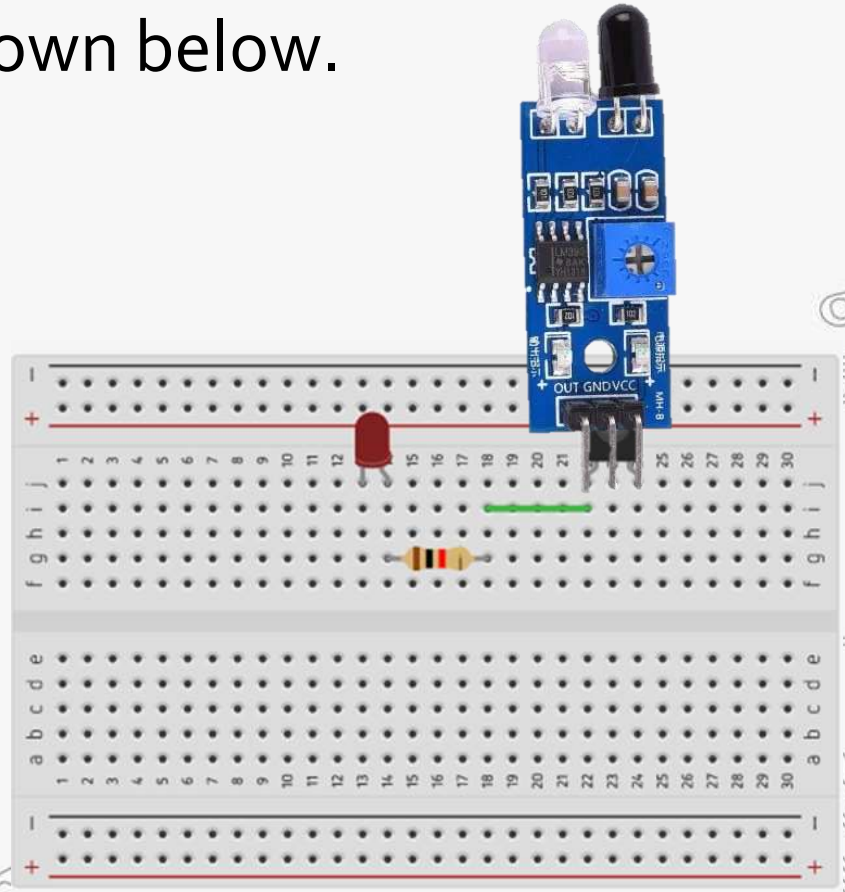
Connection Step 2

- Inter resistor in bread board and connect the anode (+) terminal of the LED to the resistor, as shown below.



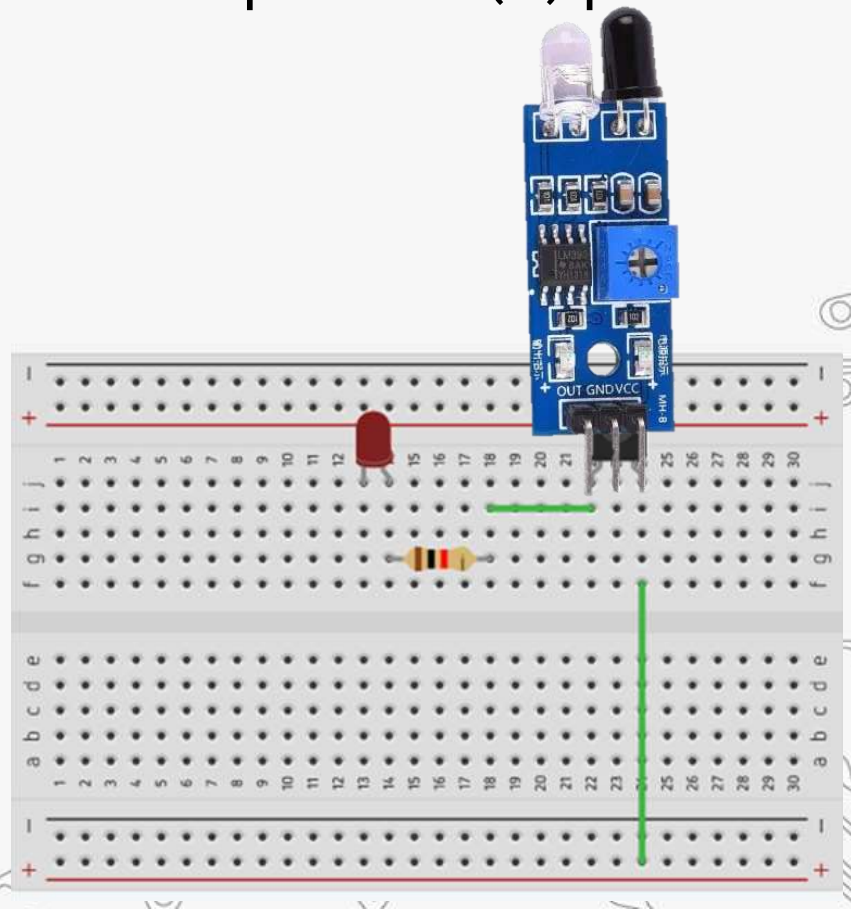
Connection Step 3

- Insert IR sensor in the bread board and connect the OUT terminal to the open end of the resistor as shown below.



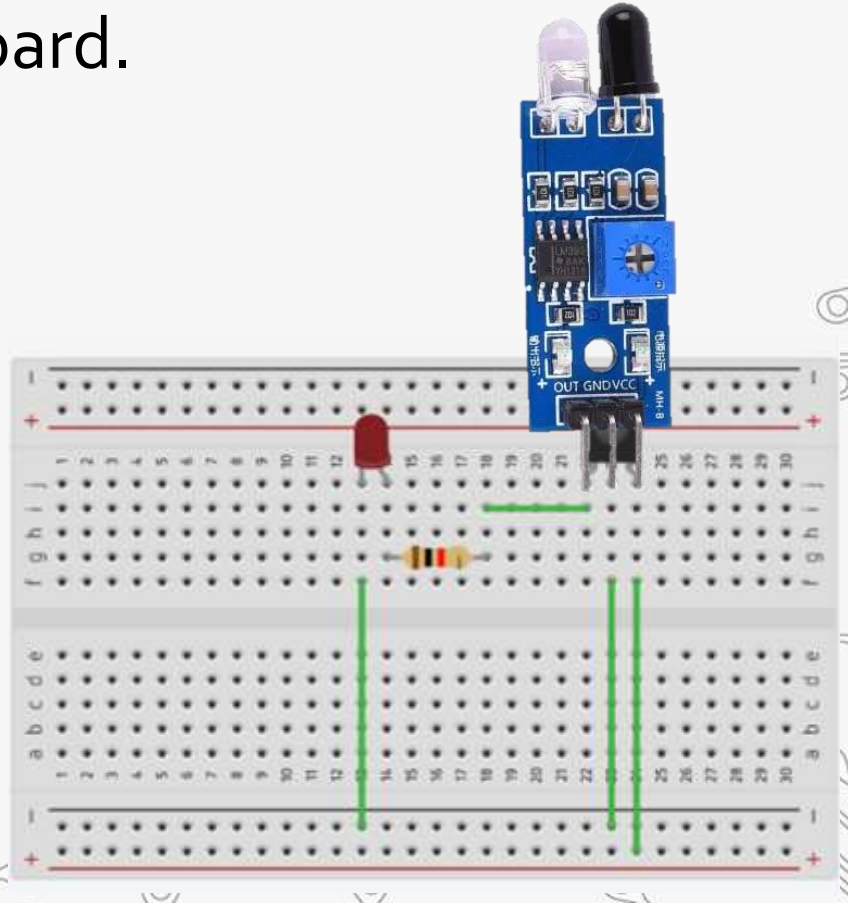
Connection Step 4

- Connect VCC terminal of IR sensor to the positive(+) power rail of bread board.



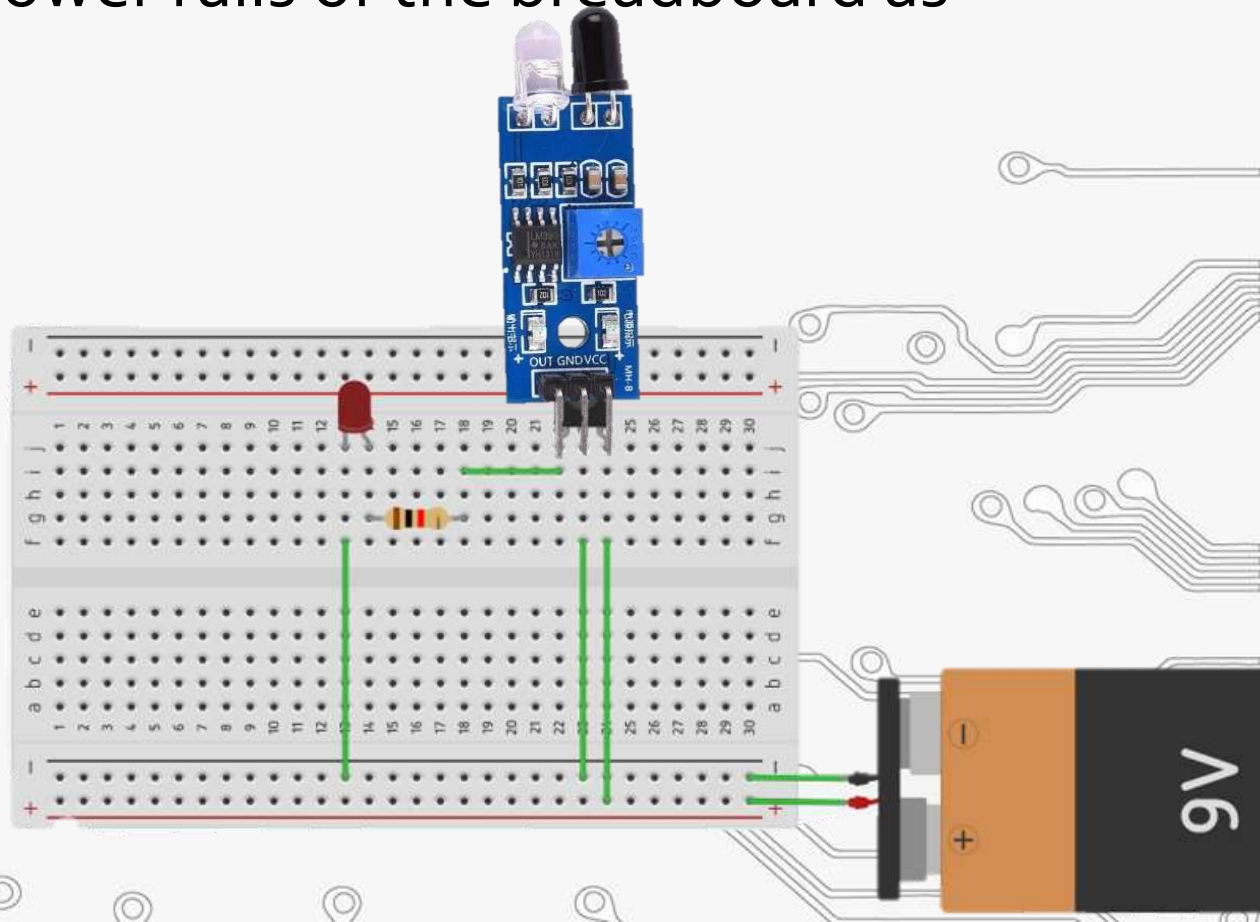
Connection Step 5

- Connect GND terminal and cathode (-) terminal of the LED to the negative (-) power rail of bread board.



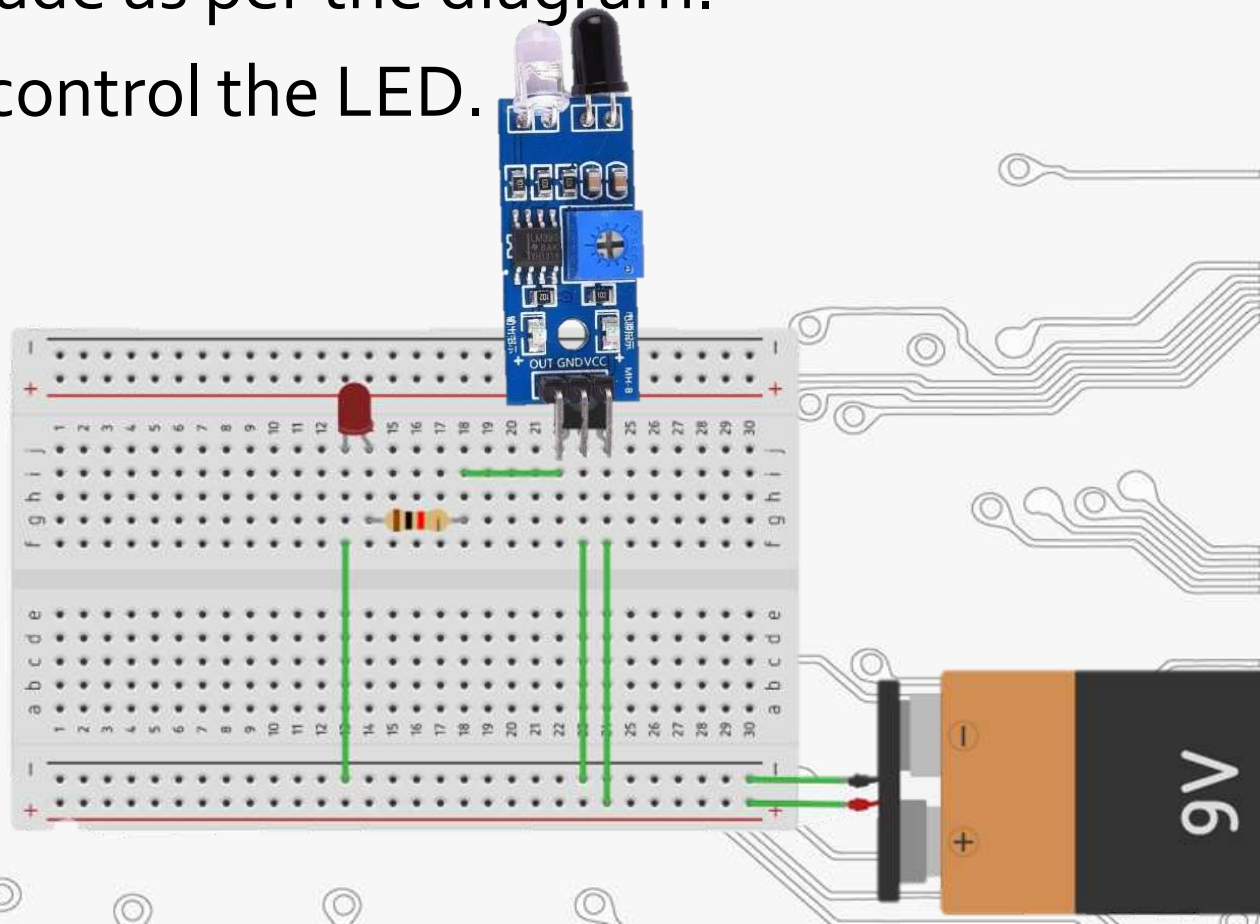
Connection Step 6

- Connect battery terminals to the power rails of the breadboard as shown below.



Connection Diagram

- Make sure your connections are made as per the diagram.
- Wave your hand over IR sensor to control the LED.



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Data & Outcomes

Learning from the activity

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Assessment

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Thank you