BEEE Project

Submitted to: MANJEET SIR

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Branch: Cse(Info. Sec)
Section/Group: 22BIS+BCC120 A
Semester: 2nd
Subject code:

AIM:

To Design Touchless doorbell

COMPONENTS:

- A bolt IoT module
- An ultrasonic Sensor
- A buzzer
- A green LED
- Jumper wires to connect the components
- A ntfy API token

Introduction:

A touchless doorbell is a modern and convenient device designed to provide a seamless and hygienic way of alerting occupants to the presence of a visitor at their door. As the name suggests, it operates without the need for physical contact, making it particularly relevant in a world concerned with minimizing the spread of germs and promoting touchless interactions. Traditionally, doorbells require a person to physically press a button or ring a bell to signal their arrival. However, touchless doorbells incorporate advanced technology such as motion sensors, infrared sensors, or proximity sensors, to detect the presence of a person near the entrance. This eliminates the need for physical contact and enables a hands-free experience.

The operation of a touchless doorbell typically involves a combination of sensors and wireless communication. When someone approaches the door, the motion or proximity sensor detects their presence and triggers a signal to activate the doorbell. This signal is often transmitted wirelessly to a receiver or a chime inside the premises, which generates an audible alert or visual notification to notify the occupants that someone is at the door.

Touchless doorbells offer numerous advantages. Firstly, they provide a hygienic solution by reducing the transmission of germs and pathogens that can occur when multiple individuals touch a common surface, such as a doorbell button. This is particularly beneficial in public spaces, offices, hospitals, or residential settings where frequent contact with doorbells is expected.

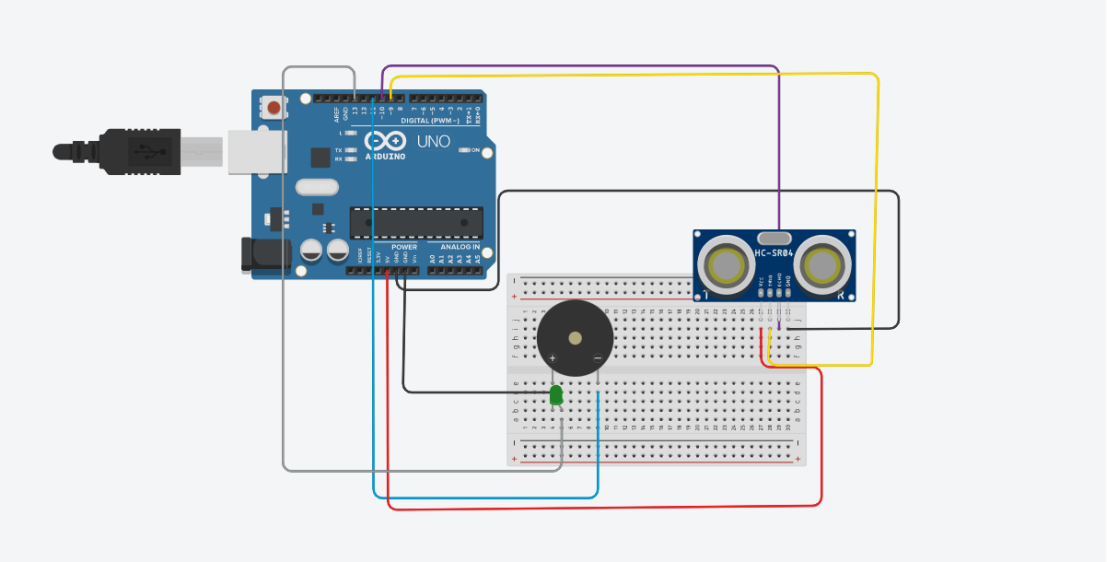
Secondly, touchless doorbells enhance accessibility for individuals with disabilities or mobility issues. People with limited dexterity or physical impairments may find it challenging to press a traditional doorbell

button. With a touchless doorbell, they can easily signal their presence without any physical effort.

Additionally, touchless doorbells often come with customizable features. They may offer different sound options, volume control, and even integration with other smart home devices, such as smartphones or virtual assistants, allowing users to receive notifications remotely or integrate the doorbell with their existing home automation systems.

In summary, touchless doorbells provide a modern, hygienic, and convenient way to receive visitors without the need for physical contact. By incorporating advanced sensor technology and wireless communication, these doorbells offer improved accessibility, reduce the spread of germs, and enhance overall user experience.

Circuit Diagram:



Working:

The working of a touchless doorbell typically involves the following steps:

Detection: Touchless doorbells incorporate sensors, such as motion sensors, infrared sensors, or proximity sensors, to detect the presence of a person near the entrance. When someone approaches the door, these sensors sense the movement, heat, or proximity of the individual.

Signal Transmission: Once the sensor detects the presence of a person, it triggers a signal that is transmitted to the doorbell's control unit or receiver. This signal can be sent wirelessly using technologies like radio frequency (RF), Bluetooth, or Wi-Fi, depending on the specific design and features of the doorbell.

Alert Generation: Upon receiving the signal, the control unit or receiver of the touchless doorbell generates an alert to notify the occupants that someone is at the door. This can be in the form of an audible sound, such as a chime or melody, or a visual indicator, such as a flashing light or LED display. Some touchless doorbells may also include vibration or smartphone notifications as alert options.

User Response: The occupants of the premises, upon hearing the alert or seeing the visual indicator, can then respond accordingly. They can proceed to answer the door or take appropriate action based on their preference or the situation.

It's worth mentioning that touchless doorbells can offer additional features and functionalities depending on their design and integration with other smart home devices. For example, some touchless doorbells can be connected to smartphones or virtual assistants, allowing users to

receive notifications remotely or communicate with the visitor through audio or video capabilities.

Overall, touchless doorbells provide a hands-free and convenient solution for alerting occupants to the presence of a visitor at the door, improving hygiene, accessibility, and user experience..

Process:

The process of a touchless doorbell typically involves the following steps:

Sensor Detection: When a person approaches the door, the touchless doorbell's sensors, such as motion sensors, infrared sensors, or proximity sensors, detect the person's presence. These sensors are designed to sense movement, heat, or proximity, depending on their type.

Signal Generation: Once the sensors detect the presence of a person, they generate a signal indicating the presence of someone at the door. This signal serves as a trigger for the doorbell to activate and notify the occupants.

Signal Transmission: The signal generated by the sensors is transmitted to the doorbell's control unit or receiver. This transmission can occur wirelessly through technologies like radio frequency (RF), Bluetooth, or Wi-Fi, depending on the specific design and capabilities of the touchless doorbell.

Alert Generation: Upon receiving the signal, the control unit or receiver of the touchless doorbell generates an alert to notify the occupants of the presence of a visitor. This alert can be in the form of an audible sound, such as a chime, melody, or recorded voice message, or a visual indicator, such as a flashing light or LED display.

User Response: Once the occupants hear the alert or see the visual indicator, they can respond to the presence of the visitor accordingly. They may choose to approach the door and physically greet the visitor, use an intercom or video communication system to communicate with the visitor, or take any other appropriate action based on the situation.

It's important to note that the specific process of a touchless doorbell can vary depending on the design, features, and technology used in the device. Some touchless doorbells may offer additional functionalities, such as integration with smartphones or smart home systems, allowing users to receive notifications remotely or control the doorbell from a distance.

The overall goal of a touchless doorbell is to provide a convenient and hygienic way to alert occupants of the presence of a visitor without the need for physical contact or pressing a button.

Troubleshooting:

Problems/faults

- No output when hand is brought in proximity to circuit
- Buzzer has weak sound
- Buzzer is on but no LED indication

Steps to Solve Problems/faults in project

No output when hand is brought in proximity to circuit

Check:

1. Supply Pin 8 +9V with respect to Pin 4 Ground

2. Pin 2 inverting input - should vary from 7V with no obstacle to approximately 3V with obstacle

3. Pin 3 Non-Inverting input: Should be adjustable with preset from 7V to 0V

Issue:

- Dry solder at connection to pin

Resolution:

- Resoldering of pin 2

Buzzer has weak sound

Check :

1. Battery voltage

Issue:

- Battery Voltage is 6-7 Volts gets loaded when buzzer is ON

Resolution:

- Changed to a new battery

Buzzer in ON but no LED indication

Check:

1. Voltage change at resistor connected to LED when buzzer sounds connection of Pin1, resistor, LED and ground
2. **Issue:** Ground connection missing to the LED circuit

Resolution:

● Soldering of ground connection to the LED circuit

References:

1.) https://technicalraju123.blogspot.com/2018/07/touch-less-door-bell.html (06/09/2020) .

2.)https://www.academia.edu/36284921/MINI_PROJECT_TITLE_TOUCH_LESS_DO OR_BELL (06/09/2020).

3.) https://www.youtube.com/watch?v=A-WQ8ikMZUQ (Touchless Doorbell Demo) (22/09/2020) .

4.) Op-Amps and Linear Integrated Circuits 4th Edition by Ramakant A Gaikwad.

5.) https://www.electronicshub.org/(13/12/2020).

Evaluation Grid:

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Worksheet completion including writing learning objectives/Outcomes.(To be submitted at the end of the day).		10
2.	Post Lab Quiz Result.		8
3.	Student Engagement in Simulation/Demonstration/Performance and Controls/Pre-Lab Questions.		12
	Signature of Faculty (with Date):	Total Marks Obtained:	