Project 4: Password Protected Security System project using Arduino, Keypad, Piezo Buzzer and LEDs on TinkerCAD

Components Used in the Project:

1. **Arduino Uno** – The microcontroller that processes the input and controls the output.
2. **4x4 or 4x3 Keypad** – Used to enter the password.
3. **LEDs (Red & Green)** – Indicate whether the password is correct or incorrect.
4. **Piezo Buzzer** – Provides an alert sound for correct or incorrect password entry.
5. **Servo Motor (Optional)** – Can be used to simulate a door lock mechanism.
6. **Resistors (220Ω or 1kΩ)** – Used with LEDs to prevent excessive current.
7. **Breadboard** – Used for easy circuit connections.
8. **Jumper Wires** – For connecting components.

Description :

In this project, a **4x4 keypad** serves as the input device. It has **eight terminals**, each connected to a **digital pin** on the **Arduino Uno**. When a key is pressed, it activates a specific function assigned to that terminal, allowing the Arduino to receive and process the input.

A **breadboard** is used to manage all external connections to the Arduino. The **power supply (5V)** and **ground (GND)** lines are distributed across the breadboard by connecting them to the respective pins on the Arduino.

For output, the system includes **two LEDs** and a **Piezo buzzer**:

- **LEDs:** One **red** and one **green** to indicate whether the entered password is correct or incorrect.
    - The **cathodes** of both LEDs are connected to the **ground** through resistors.
    - The **anodes** are connected to digital pins **D10** and **D11** of the Arduino.
- **Piezo Buzzer:** Used for audio feedback.
    - The **positive terminal** is connected to **D12**.

- The **negative terminal** is connected to the **ground line** on the breadboard.