CODE EXPLANATION

- The Arduino program is designed to monitor gas concentration and provide an alert when unsafe levels are detected. It starts by including the LiquidCrystal library, which allows the Arduino to control a 16×2 LCD display. The LCD pin connections are defined so that messages can be shown clearly. The gas sensor is connected to an analog input pin to read varying gas levels, while separate digital pins are assigned to an LED and a buzzer for warning indications. A variable is used to store the sensor readings for further processing.
- Inside the setup function, the LED and buzzer pins are set as output devices. The LCD is initialized and briefly displays a startup message to indicate that the system is active. Serial communication is also enabled so that the gas sensor values can be observed through the Serial Monitor for testing and monitoring purposes. After initialization, the program moves into the loop function, which runs continuously.
- In the loop, the Arduino reads the analog output from the gas sensor, which reflects the concentration of gas present in the environment. This value is displayed on the LCD in real time. The program then compares the sensor reading with a preset safety threshold. When the gas level rises above this limit, the LED and buzzer are automatically activated, and an alert message is shown on the display. If the gas level remains within safe limits, the alert devices stay off and a safe status is indicated. A short delay is included to maintain stable readings and smooth operation, ensuring reliable and continuous gas monitoring.