**EEE 320 INTRODUCTION TO INTERNET OF THINGS**

**INTERM APPLICATION HOMEWORKS**

**(40P) Q3.** Perform an application for your board, sensor (chosen for App-1) and wireless communication module (chosen for App-2), in which you will determine the scope. A dc motor (Brushed, Step, or Servo) and one RGB (or at least three LEDs) should be used in your circuit.

**Purpose of Application:** You are free about the purpose of application. Clearly state the intended purpose (i.e, what you are trying to do for each situation) in your video capture and in this document.

**Circuit Diagram:** You are free to build your circuit for application. Draw your circuit in **Fritzing.**

**Restriction:** There is no restriction. You can use any IDE and programming language you want.

**Simulation:** Simulate on one of the platforms: Proteus, TinkerCad or Wokwi

**Homework Submission:** Record a videowith all the team members for your application. In your video content; explain your program codes line by line, running the simulation successfully, show your program to be compiled successfully, show your program to be loaded to your board, show your circuit to be run successfully for each case.

The following files need to be uploaded to Teams.

1. This word document by completing the ANSWERS section (DO NOT upload as pdf)
2. Your video file (MUST be talked in English)
3. Fritzing circuit file
4. Simulation project file (if proteus) or link (if TinkerCAD or Wokwi)
5. Application project folder created by IDE software. Include your source file

------------------------------------------------ANSWERS-----------------------------------------------

**Project Team :** Suat Deniz

**Board Selected :** Raspberry Pi Pico W

**Sensor Selected :** MQ-5 Gas Sensor

**Wireless Communication Module Selected :** Infrared Module

**DC Motor Selected :** DC Stepper Motor 28BYJ-48

**Your Software IDE :** Arduino IDE

**Your Programming Language :** Arduino

**Application Purpose:**

This project is to design and implement a control system that integrates a gas sensor, an IR remote control, a stepper motor, and RGB LEDs. This system aims to achieve the following objectives:

1. **Gas Detection**: The primary objective is to detect the presence of gas using a gas sensor. Gas detection is essential for safety considerations, particularly in environments where gas leaks or high concentrations can pose health risks or fire hazards. By accurately detecting gas levels, the system can trigger appropriate responses to mitigate potential dangers or alert users to take necessary precautions.
2. **Stepper Motor Control**: Another key objective is to utilize a stepper motor for performing specific actions in response to gas detection events or user commands via the IR remote control. The stepper motor provides precise control over mechanical movements, allowing for tasks such as activating ventilation systems, closing off gas valves, or implementing other safety-related actions as dictated by the system's logic.
3. **IR Remote Integration**: The system integrates with an IR remote control to enhance user interaction and control capabilities. Users can send commands to the system using a standard IR remote control device, enabling them to adjust the speed or direction of the stepper motor, change RGB LED colors, or trigger other predefined actions. The IR remote control functionality offers users a convenient interface for interacting with the system from a distance, without the need for direct physical contact.
4. **RGB LED Feedback**: Visual feedback is provided through RGB LEDs to indicate system status or user-selected options. The color of the RGB LEDs changes dynamically based on system events, such as gas detection events or commands received via the IR remote control. This visual feedback enhances the user experience by providing clear and intuitive indications of system status and responses to user input.

Overall, the project aims to design and implement an integrated control system that enhances safety and user convenience in environments where gas detection and control are critical. By combining gas sensing capabilities, precise motor control, remote user interaction via IR remote control, and visual feedback through RGB LEDs, the system offers a comprehensive solution for managing gas-related risks and ensuring efficient control and monitoring in various project contexts.

**Fritzing Circuit Diagram:**

elektronik donanım, elektronik mühendisliği, devre, elektronik bileşen içeren bir resim

Açıklama otomatik olarak oluşturuldu

**Program codes:**

metin, ekran görüntüsü, yazı tipi içeren bir resim

Açıklama otomatik olarak oluşturuldu

metin, ekran görüntüsü, yazı tipi içeren bir resim

Açıklama otomatik olarak oluşturuldu

metin, ekran görüntüsü, yazı tipi, sayı, numara içeren bir resim

Açıklama otomatik olarak oluşturuldu

metin, ekran görüntüsü, yazı tipi, sayı, numara içeren bir resim

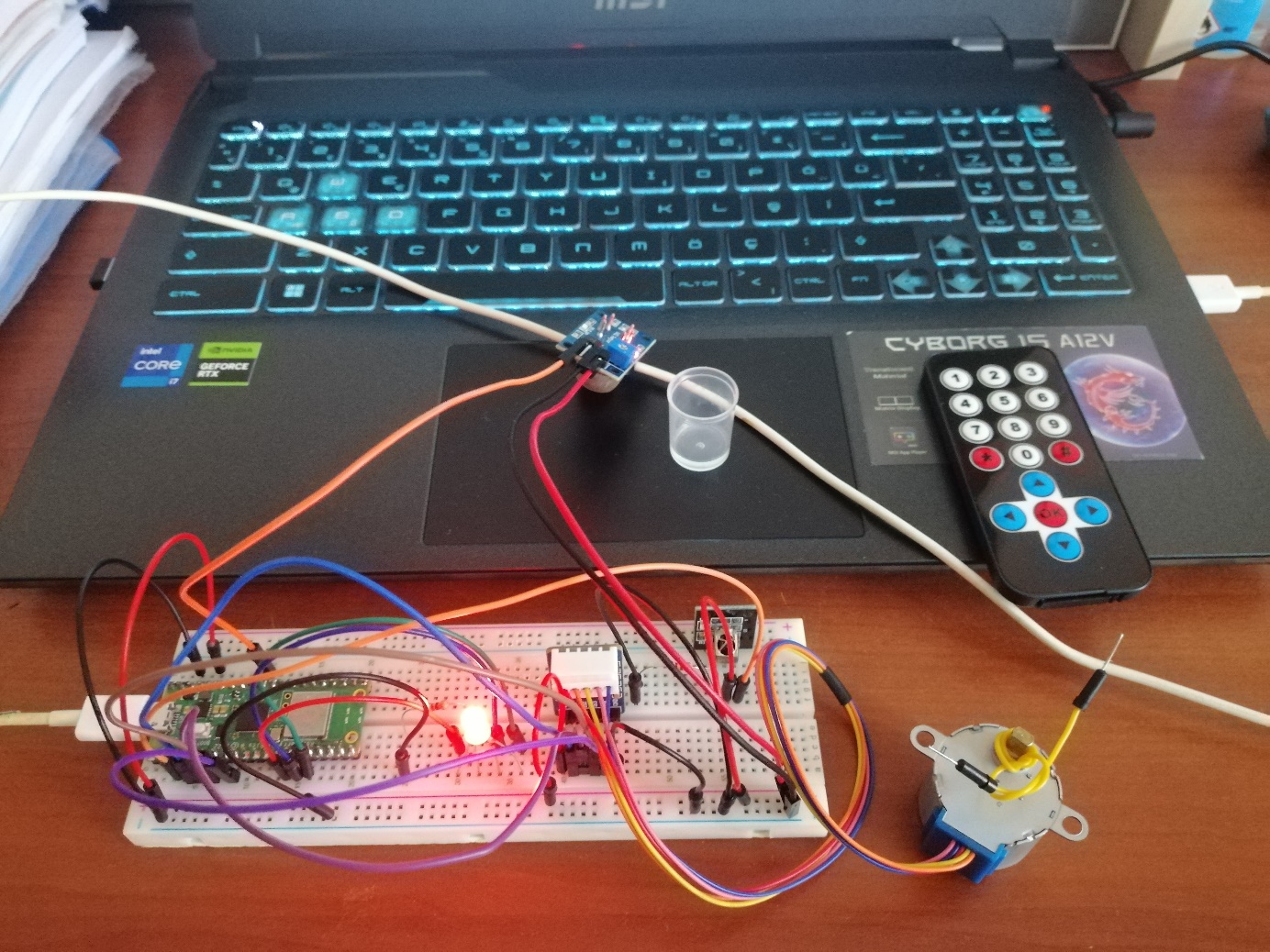
Açıklama otomatik olarak oluşturuldu

**Simulation (Single screenshot):**

metin, ekran görüntüsü, yazılım, multimedya yazılımı içeren bir resim

Açıklama otomatik olarak oluşturuldu

**Photo for your circuit (only 1 photo):**

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