Microwave System

Aim:

This project simulates the embedded controller in a microwave oven.

Requirements:

- AtMega328p MCU (Arduino kit)
- LCD 16*2
- 3 Push Buttons
- DC motor
- Buzzer
- Red, yellow ,and green LEDs
- Ultrasonic sensor (HC-SR04)

Procedure details:

- Use one push button to turn on/off the Microwave.
- If the Microwave is off, a red LED turns on, and if you pressed the button to turn it on, a green LED turns on, and a buzzer generates a long sound for 2 seconds, then LCD shows the word “Microwave” without double quotes for 2 seconds.
- After that, the user must choose one of two modes on LCD:
  1) Auto
  2) Manual
- If he chooses the number ‘1’ (Auto mode), he must choose the cooking operation from the following 2 options:
  1) Chicken
  2) Meat

  Then user must enter the number of kilos of meat or chicken, then the system will calculate the time required automatically, 10 seconds for 250 gram of chicken, and 15 seconds for 500 gram of meat.
- After that the motor starts rotating to cook the food, and the time will count down on LCD in the form of **hr : min : sec**. (i.e.) if the user enters 2 kilos of

meat, the timer will count from **00:01:00** to **00:00:00** and will be updated on the LCD every second.

- During the cooking time, a yellow LED turns on.
- If the user tries to close his hand from the ultrasonic sensor during cooking time, the cooking will be paused, red LED blinking, buzzer generates a continuous sound, showing the remaining time on LCD, and it will resume if he removed his hand.
- To pause the cooking, the second button must be pressed one time, and to resume the cooking, you must press it for the second time.
- If the cooking is resumed the green LED turns on, and the cooking will continue.
- When the cooking is paused because of the second button, the yellow LED will blink, showing the remaining time on the LCD.
- When the time ends, the buzzer generates beeps with blinking the three LEDs until the user presses the third button to open the door.
- If the user chooses ‘2’ (Manual mode), then he will be asked to enter the time in the form of **hr : min : sec**, then the LCD will count down as described earlier.

Project Delivery:

ZIP file that contains:

- Link for the simulated project on TinkerCad.
- A recorded video to explain the code (don't exceed 5 min).
- Snap shot for the circuit.

Project Deadline:

16th September.

Notes:

- You can use Serial communication to enter the data.
- You will get bonus marks if you add any feature in the project.
- You would gain bonus marks if you wrote your project in a good coding style.