**IoT Based Safety Gadget for Child Safety Monitoring and Notification**

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**Assignment 1**

ASSIGNMENT:2

**QUESTION**

**Build a smart home in Thinkercad with 2 sensors, an Led, buzzer and submit it.**

|  |
| --- |
| // \*\*\* LCD Display \*\*\* |
|  | #include<LiquidCrystal.h> |
|  | LiquidCrystal lcd(2,3,4,5,6,7); |
|  |  |
|  | // \*\*\* Ultrasonic Sensor \*\*\* |
|  | int trigPin = 12; |
|  | int echoPin = 13; |
|  | float travelTime; |
|  | float level; |
|  | float speed;//miles per hour |
|  |  |
|  | float readStatusofContainer(int trigPin,int echoPin) |
|  | { |
|  | //sending ping |
|  | digitalWrite(trigPin,LOW); |
|  | delayMicroseconds(100); |
|  | digitalWrite(trigPin,HIGH); |
|  | delayMicroseconds(10); |
|  | digitalWrite(trigPin,LOW); |
|  | //returns round trip time of container status |
|  | return pulseIn(echoPin,HIGH); |
|  | } |
|  |  |
|  | // \*\*\* DC Motor \*\*\* |
|  | int motorPin = 8; |
|  |  |
|  | // \*\*\* PIR Sensor \*\*\* |
|  | int pirPin = 9; |
|  |  |
|  | // \*\*\* Light \*\*\* |
|  | int lightPin = 10; |
|  |  |
|  | // \*\*\* Gas Sensor \*\*\* |
|  | int gasPin = A0; |
|  | int threshold = 400; |
|  |  |
|  | // \*\*\* Piezo \*\*\* |
|  | int buzzPin = 11; |
|  |  |
|  | // \*\*\* LED \*\*\* |
|  | int ledPin = 0; |
|  |  |
|  | void setup() |
|  | { |
|  | Serial.begin(9600); |
|  |  |
|  | // \*\*\* LCD Display \*\*\* |
|  | lcd.begin(16,2); |
|  |  |
|  | // \*\*\* Ultrasonic Sensor \*\*\* |
|  | pinMode(trigPin,OUTPUT); |
|  | pinMode(echoPin,INPUT); |
|  |  |
|  | // \*\*\* DC Motor \*\*\* |
|  | pinMode(motorPin,OUTPUT); |
|  |  |
|  | // \*\*\* PIR Sensor \*\*\* |
|  | pinMode(pirPin,INPUT); |
|  |  |
|  | // \*\*\* Light \*\*\* |
|  | pinMode(lightPin,OUTPUT); |
|  |  |
|  | // \*\*\* Gas Sensor \*\*\* |
|  | pinMode(gasPin,INPUT); |
|  |  |
|  | // \*\*\* Piezo \*\*\* |
|  | pinMode(buzzPin, OUTPUT); |
|  |  |
|  | // \*\*\* LED \*\*\* |
|  | pinMode(ledPin,OUTPUT); |
|  | } |
|  |  |
|  | void loop() |
|  | { |
|  | // \*\*\* Trash can monitoring \*\*\* |
|  | // Trash can height 5 inches |
|  | travelTime = readStatusofContainer(trigPin,echoPin);//microseconds |
|  | travelTime = travelTime/1000000;//seconds |
|  | travelTime = travelTime/3600;//hours |
|  | speed = 60.0;//miles per hour(86.4 for 5 inches) |
|  | level = speed \* travelTime;//miles |
|  | level = level/2;//because travelTime is round trip time |
|  | level = level \* 63360;//inch |
|  | if(level <= 4.5) |
|  | { |
|  | //dispaly status |
|  | lcd.clear(); |
|  | lcd.setCursor(0,0); |
|  | lcd.print("Trash Level:"); |
|  | lcd.setCursor(0,1); |
|  | lcd.print(level); |
|  | lcd.print(" inches"); |
|  | delay(100); |
|  | } |
|  | else |
|  | { |
|  | //dispaly status |
|  | lcd.clear(); |
|  | lcd.setCursor(0,0); |
|  | lcd.print("Trash is full"); |
|  | lcd.setCursor(0,1); |
|  | lcd.print(level); |
|  | lcd.print(" inches away"); |
|  | delay(100); |
|  | } |
|  |  |
|  | // \*\*\* Water level monitoring \*\*\* |
|  | // Water tank height 20 inches |
|  | travelTime = readStatusofContainer(trigPin,echoPin);//microseconds |
|  | travelTime = travelTime/1000000;//seconds |
|  | travelTime = travelTime/3600;//hours |
|  | speed = 240.1;//miles per hour(345.3 for 20 inches) |
|  | level = speed \* travelTime;//miles |
|  | level = level/2;//because travelTime is round trip time |
|  | level = level \* 63360;//inch |
|  | if(level <= 19.0) |
|  | { |
|  | //dispaly status and Turn on motor |
|  | digitalWrite(motorPin,HIGH); |
|  | lcd.clear(); |
|  | lcd.setCursor(0,0); |
|  | lcd.print("Level: Motor"); |
|  | lcd.setCursor(0,1); |
|  | lcd.print(level); |
|  | lcd.print(" in On"); |
|  | delay(100); |
|  | } |
|  | else |
|  | { |
|  | //dispaly status and Turn off motor |
|  | digitalWrite(motorPin,0); |
|  | lcd.clear(); |
|  | lcd.setCursor(0,0); |
|  | lcd.print("Level: Motor"); |
|  | lcd.setCursor(0,1); |
|  | lcd.print(level); |
|  | lcd.print(" in Off"); |
|  | delay(100); |
|  | } |
|  |  |
|  | // \*\*\* Motion Detection |
|  | if(digitalRead(pirPin)==HIGH) |
|  | digitalWrite(lightPin, HIGH); |
|  | else |
|  | digitalWrite(lightPin, LOW); |
|  | delay(100); |
|  |  |
|  | // \*\*\* Detects flammable gases \*\*\* |
|  | if(analogRead(gasPin) >= threshold) |
|  | { |
|  | digitalWrite(ledPin,HIGH); |
|  | digitalWrite(buzzPin,HIGH); |
|  | } |
|  | else |
|  | { |
|  | digitalWrite(ledPin,LOW); |
|  | digitalWrite(buzzPin,LOW); |
|  | } |
|  | delay(100); |
|  | } |