Q) Design a circuit to measure distance in cm and mm using ultrasonic sensor & 16x2LCD display. Also display warning message on LCD when distance is less then 20cm.

#include <LiquidCrystal.h>

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

const int trigPin = 9;

const int echoPin = 8;

void setup() {

pinMode(trigPin,OUTPUT);

pinMode(echoPin,INPUT);

lcd.begin(16, 2);

}

long microsecondsToCentimeters(long microseconds) {

return microseconds / 29 / 2;

}

long microsecondsToMillimeter(long microseconds) {

return microseconds / 29 / 2 \* 10;

}

void loop() {

long duration, cm, millimeter;

digitalWrite(trigPin, LOW);

delayMicroseconds(2);

digitalWrite(trigPin, HIGH);

delayMicroseconds(10);

digitalWrite(trigPin, LOW);

duration = pulseIn(echoPin, HIGH);

cm = microsecondsToCentimeters(duration);

millimeter = microsecondsToMillimeter(duration);

lcd.setCursor(0,0);

lcd.print(cm);

lcd.print("cm, ");

lcd.print(millimeter);

lcd.print("mm");

delay(100);

if (cm < 20)

{

lcd.setCursor(0,1);

lcd.print("WARNING");

}

else

{

lcd.clear();

}

}

Q1) What is the max range (distance) that Ultrasonic Sensor can detect?

ANSWER:

Ultrasonic sensor can detect up to 20 meters.

Q2) What environmental conditions affect an ultrasonic sensor?

ANSWER:

Increase in temperature effect ultrasonic sensor.

Q3) Name some projects where ultrasonic sensor can be used.

ANSWER:

1. Collision Avoiding Robot.
2. Smart Walking Cane.
3. GPS Guided Mobile Robot.