**PROJECT ON garage parking**

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ABSTRACT:

It is often seen that people who have small garages has a problem of parking their vehicle at the correct place.More than often they park a little bit too far in and collide with the objects present there.To get rid of this problem we have planned a collision avoidance system in the garage which will ensure safe parking of the vehicle by displaying the distance from the object infront of the vehicle. A 'stop' message will be displayed when it's time to stop.

COMPONENTS:

1)An Arduino Board

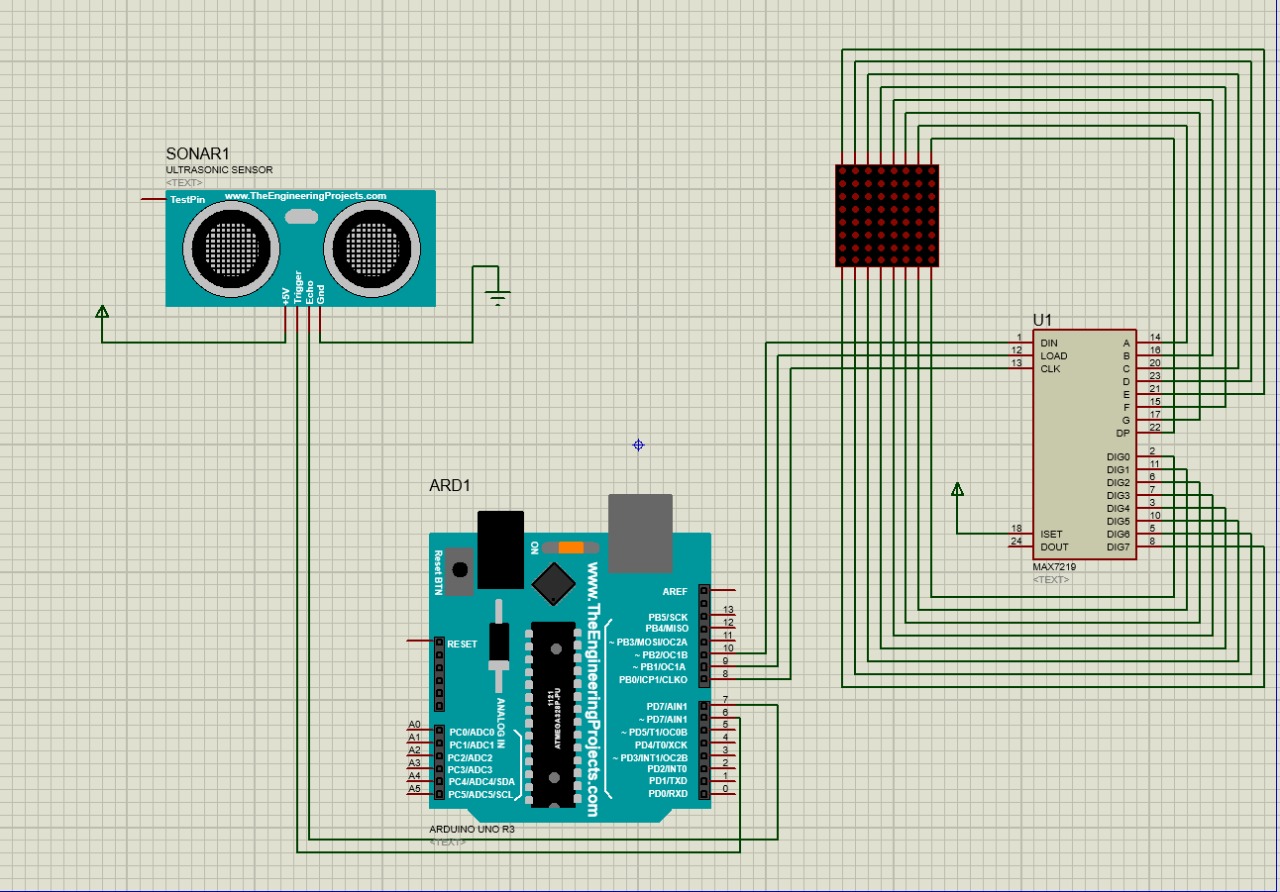
2)MAX7219 LED Dot Matrix 4 In 1 Display with 5P Line Module:

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|  | |
|  | |
| Input Voltage (V) | 5 | |
| LED Colour | Red | |
| LED Display Dimensions (mm) | 32x32x6 (LxWxH) | |
| Weight | 0.125 kg | |
| Dimensions | 13 × 4 × 1 cm | |

3) Ultrasonic Ranging Module HC - SR04

|  |  |
| --- | --- |
| Working Voltage | DC 5 V |
| Working Current | 15mA |
| Max Range | 4m |
| Min Range | 2cm |
| Measuring Angle | 15 degree |
| Dimension | 45x20x15mm |

Schematics :-



CIRCUIT WORKING PROCEDURE :-

The HC-SR04 module, Arduino Uno board and the MAX7219 LED Dot Matrix Display are connected according to the above shown circuit diagram. At its core, the HC-SR04 Ultrasonic distance sensor consists of two ultrasonic transducers. The one acts as a transmitter which converts electrical signal into 40 KHz ultrasonic sound pulses. The receiver listens for the transmitted pulses. If it receives them it produces an output pulse whose width can be used to determine the distance the pulse travelled.

It all starts, when a pulse of at least 10 µS (10 microseconds) in duration is applied to the Trigger pin. In response to that the sensor transmits a sonic burst of eight pulses at 40 KHz. This 8-pulse pattern makes the “ultrasonic signature” from the device unique, allowing the receiver to differentiate the transmitted pattern from the ambient ultrasonic noise. The eight ultrasonic pulses travel through the air away from the transmitter. Meanwhile the Echo pin goes HIGH to start forming the beginning of the echo-back signal. If those pulses are reflected back the Echo pin goes low as soon as the signal is received. This produces a pulse whose width varies between 150 µS to 25 mS, depending upon the time it took for the signal to be received. The width of the received pulse is then used to calculate the distance to the reflected object.



This can be worked out using simple distance-speed-time equation.



The LED dot matrix is programmed in a way to display the data received from the sensor and if the distance between the sensor and the obstacle becomes less than the defined limiting distance then the LED dot matrix displays “STOP” to the user.