

U BRUNDA

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Project 2 : Obstacle Avoidance Robot using Ultrasonic Sensor

Abstract:

Creating an obstacle avoidance robot using 2 dc gear motor, Ultrasonic sensor and Arduino.

Introduction:

Using an Arduino Uno, two motors as sensors and a ultrasonic distance sensor with a proper structured code the components are simulated to create an obstacle avoidance robot.

Methodology:

- Arduino Uno is connected through a normal wire to breadboard from pin 13 to pin 27 in h. Another wire from pin 12 to pin 27 in d.
- From Ultrasonic distance sensor of Vcc to positive terminal, TRIG to pin 27 in g, ECHO to pin 27 in c are connected and GND is connected to the negative terminal.
- Positive terminal of motor1 to pin 17 in j and negative terminal of motor1 to pin 14 in j.
- Positive terminal of motor2 to pin 14 in a and negative terminal of motor2 to pin 17 in a.
- Connections from arduino to breadboard are:
 - Pin 5 to pin 13 in j of breadboard
 - Pin 4 to pin 18 in j of breadboard
 - Pin 3 to pin 18 in a of breadboard
 - Pin 2 to pin 13 in a of breadboard
- One of the positive terminal of breadboard is connected to the pin 12 in j and the other positive terminal is connected to pin 12 in a.
- One of the negative terminal in breadboard from motor1 is connected to pin 15 and the other in pin 16 of j.
- Similarly, the other motor2 is connected to the same pins in a.

Code:

```
const int trigPin = 13;
```

```
const int echoPin = 12;
```

```
const int in1 = 2;
```

```
const int in2 = 3;
```

```
const int in3 = 4;
```

```
const int in4 = 5;
```

```
void setup() {
```

```
    pinMode(trigPin, OUTPUT);
```

```
    pinMode(echoPin, INPUT);
```

```
    pinMode(in1, OUTPUT);
```

```
    pinMode(in2, OUTPUT);
```

```
    pinMode(in3, OUTPUT);
```

```
    pinMode(in4, OUTPUT);
```

```
    Serial.begin(9600);
```

```
}
```

```
long duration;
```

```
int distance;
```

```
void loop()
```

```
{
```

```
    digitalWrite(trigPin, LOW);
```

```
    delay(2);
```

```
    digitalWrite(trigPin, HIGH);
```

```
    delay(10);
```

```
    digitalWrite(trigPin, LOW);
```

```
    duration=pulseIn(echoPin, HIGH);
```

```
    distance = duration* 0.034/2;
```

```
    Serial.println(distance);
```

```

if(distance<50){
    digitalWrite(in1, HIGH); // one pin HIGH and the other Pin LOW
    digitalWrite(in2, LOW); // As to rotate in forward direction
    digitalWrite(in3, LOW); // If 3 are low and 1 is high then
    digitalWrite(in4, LOW); // one motor works and the other doesn't
}

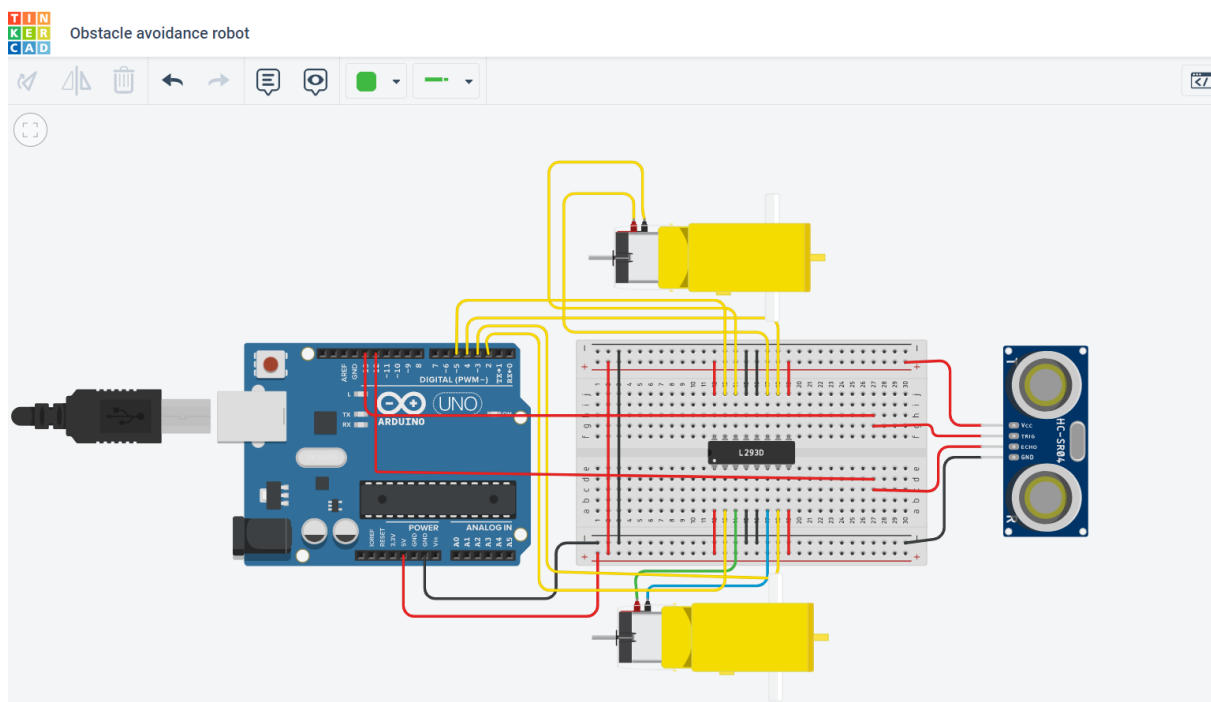
```

```

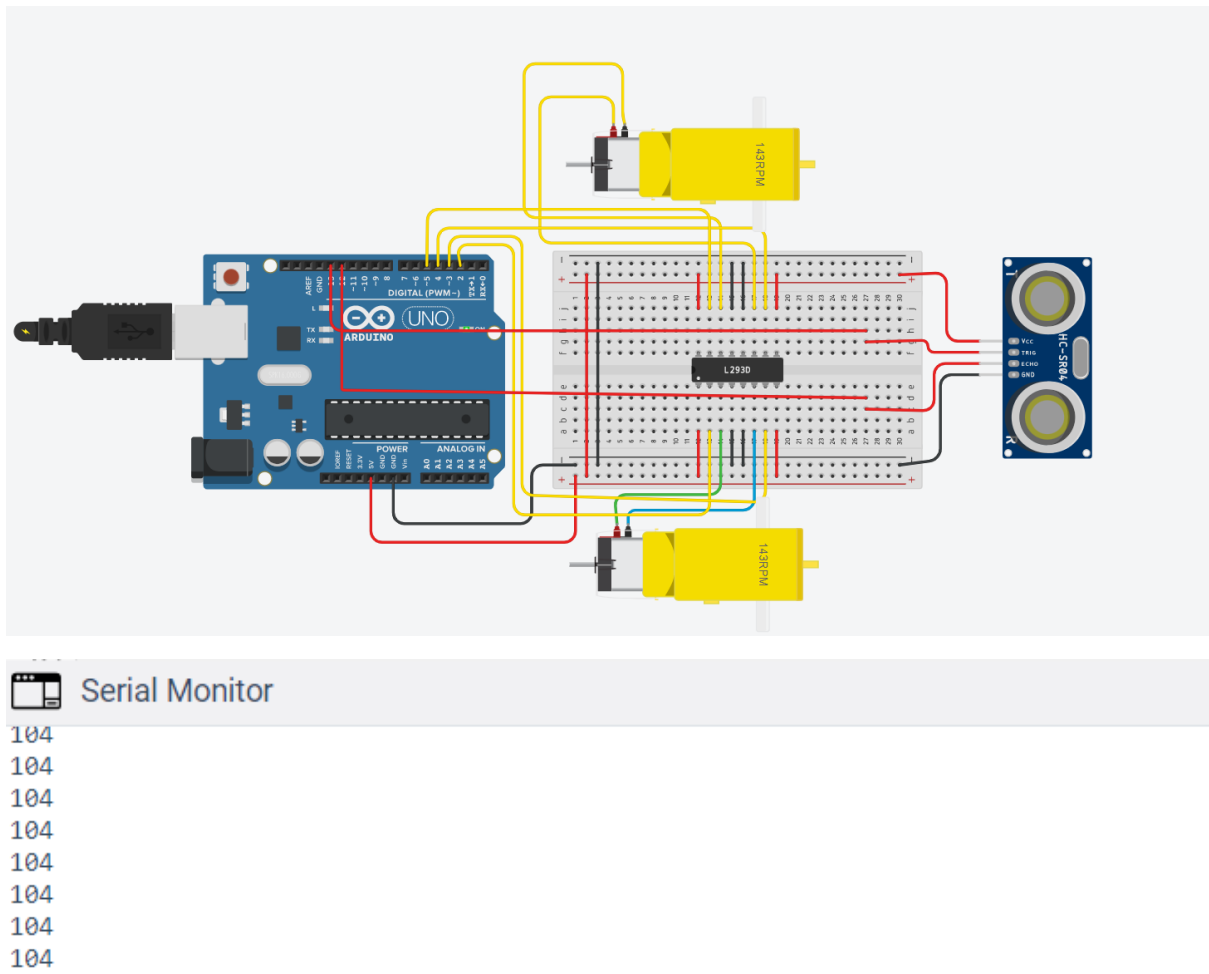
else {
    digitalWrite(in1, HIGH);
    digitalWrite(in2, LOW);
    digitalWrite(in3, HIGH);
    digitalWrite(in4, LOW);
    delay(200);
}
}

```

Before Simulation Screenshot:



After Simulation Screenshot:



Conclusion:

The two motors as sensors moves according to the given input. Hence the obstacle avoidance robot is created and implemented successfully.