



**Design a control system
for the production line:**

1-Determine the sensors used:

- Ultrasonic Sensor.

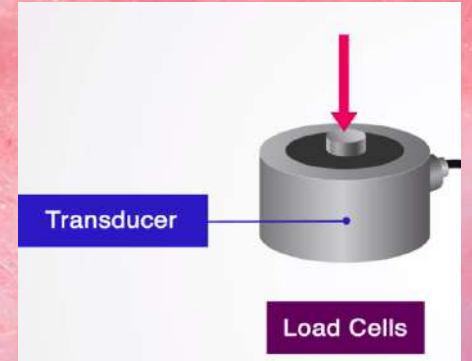
Other sensors we can use:

- Transducer.

- Hydraulic.

- Capacitance.

- Strain Gauge.

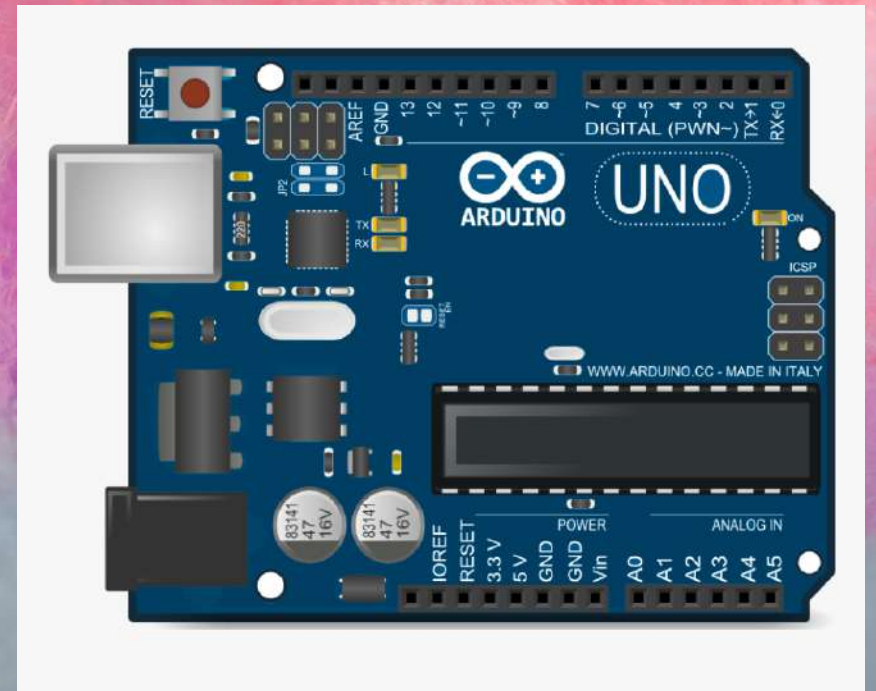


2- Select the controller used:

In this simple project we use **Arduino**.

Or

As for the factories and big production lines we use **PLC technology**

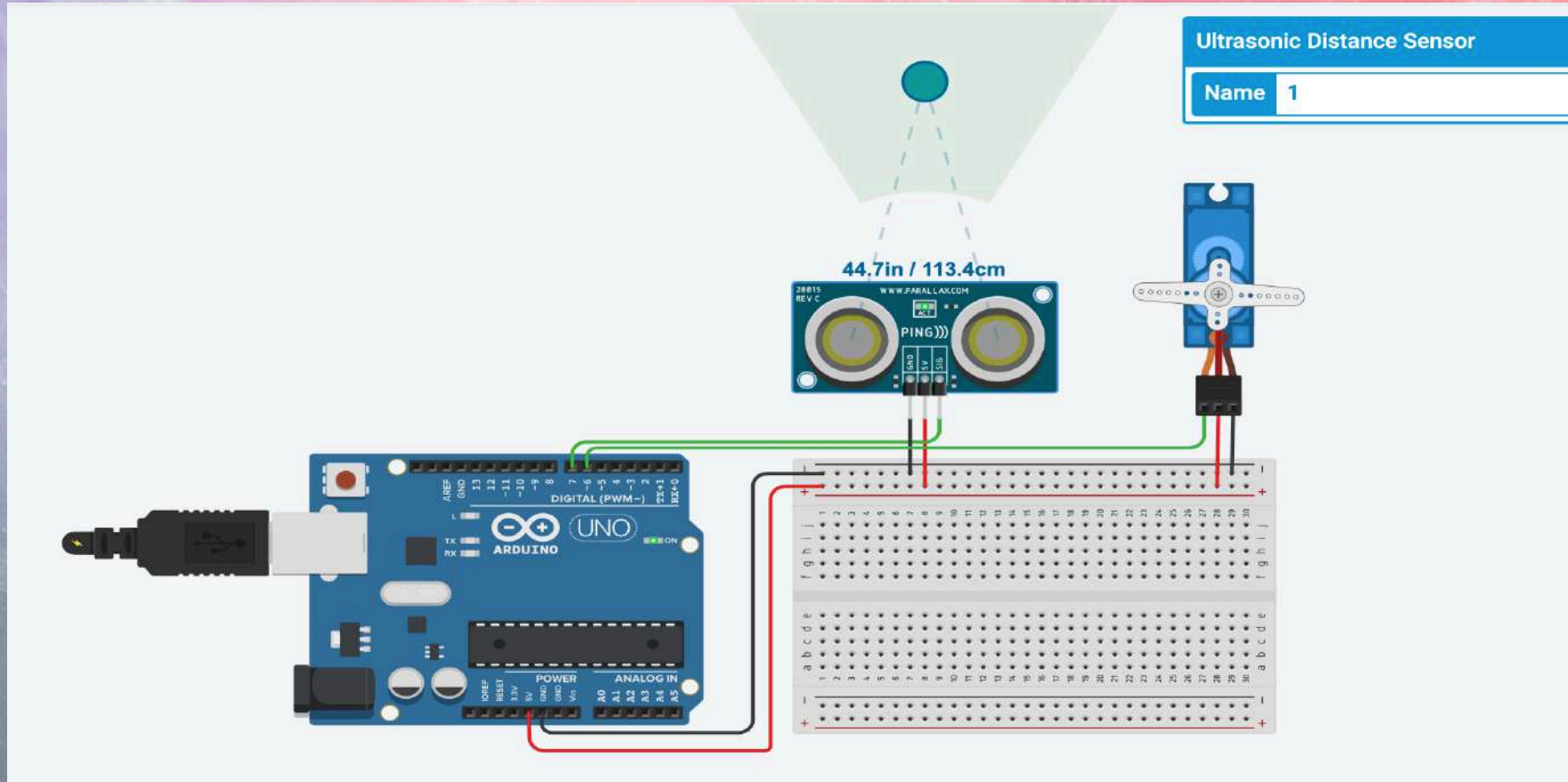


3- Select the right engines:
Servo motor.

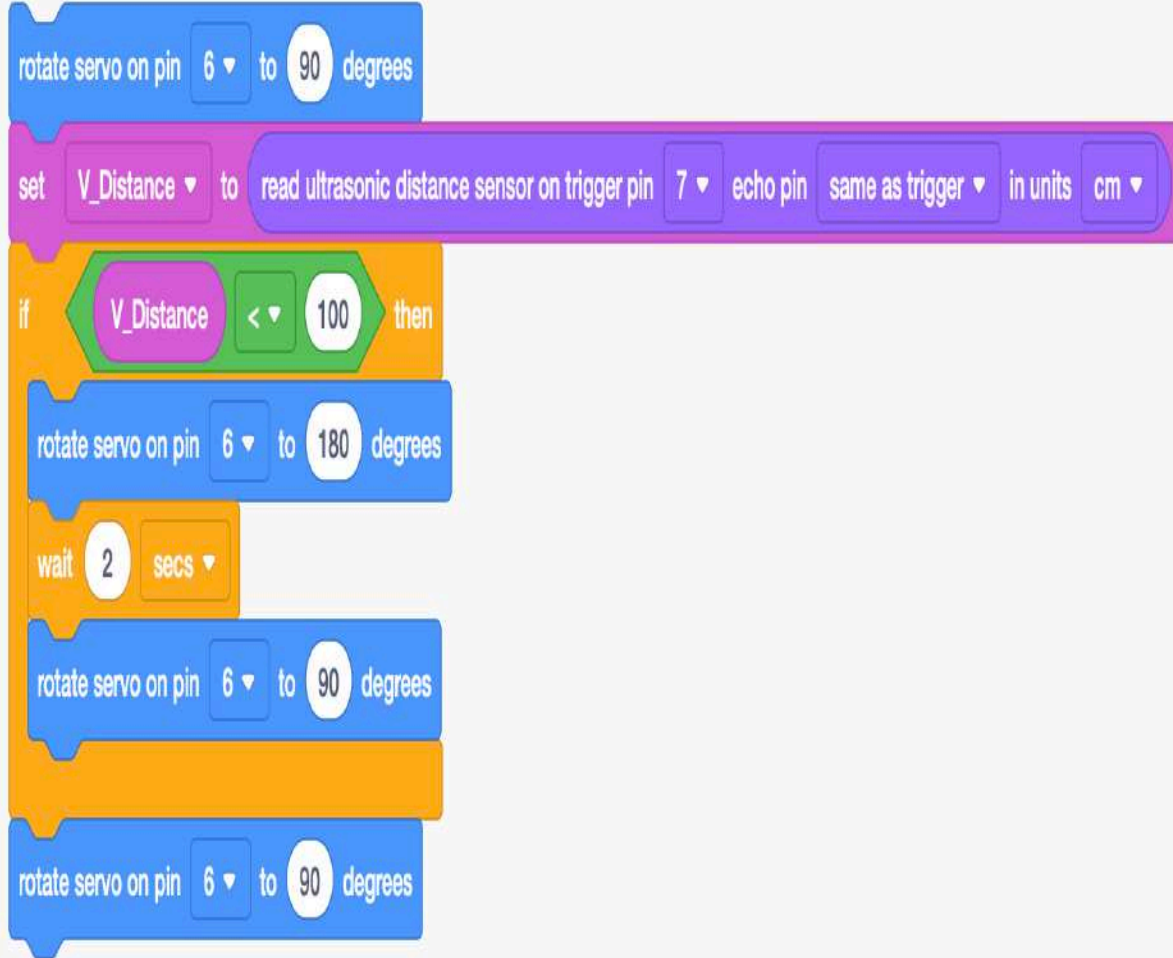


Micro Servo

4- Design the electronic circuit:



5- Electronic controller programming:



```
1 #include <Servo.h>
2
3 int V_Distance = 0;
4
5 Servo servo_6;
6
7 long readUltrasonicDistance(int triggerPin, int echoPin)
8 {
9     pinMode(triggerPin, OUTPUT); // Clear the trigger
10    digitalWrite(triggerPin, LOW);
11    delayMicroseconds(2);
12    // Sets the trigger pin to HIGH state for 10 microseconds
13    digitalWrite(triggerPin, HIGH);
14    delayMicroseconds(10);
15    digitalWrite(triggerPin, LOW);
16    pinMode(echoPin, INPUT);
17    // Reads the echo pin, and returns the sound wave travel time in microseconds
18    return pulseIn(echoPin, HIGH);
19 }
20
21 void setup()
22 {
23     servo_6.attach(6);
24 }
25
26
27 void loop()
28 {
29     servo_6.write(90);
30     V_Distance = 0.01723 * readUltrasonicDistance(7, 7);
31     if (V_Distance < 100) {
32         servo_6.write(180);
33         delay(2000); // Wait for 2000 millisecond(s)
34         servo_6.write(90);
35     }
36     servo_6.write(90);
37 }
```