

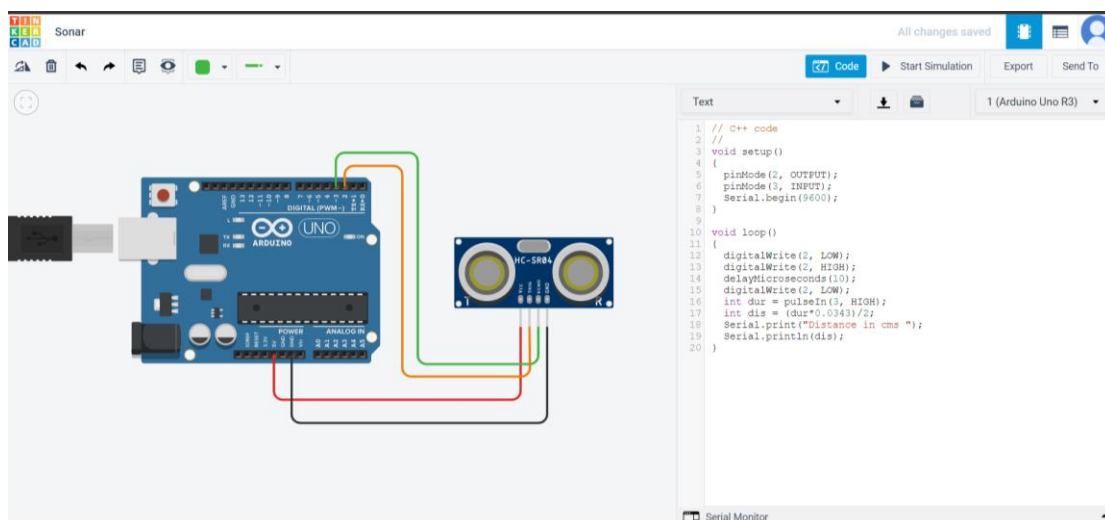
# Integrate Digital And Analog I/O's With Arduino UNO

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## 1. Explore Ultrasonic sensor for distance measurement and integrate it with Arduino UNO

Ultrasonic Sensor HC-SR04 is a sensor that can measure **distance**. It emits an **ultrasound** at **40 000 Hz (40kHz)** which travels through the air and if there is an object or obstacle on its path It will bounce back to the module. Considering the travel time and the speed of the sound you can calculate the distance.

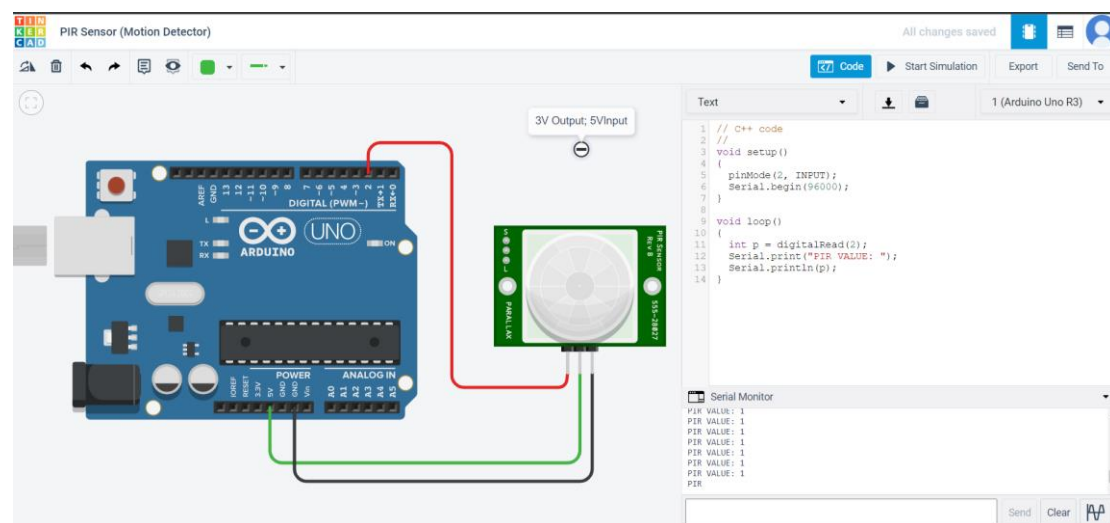
The configuration pin of HC-SR04 is VCC (1), TRIG (2), ECHO (3), and GND (4). The **supply voltage** of VCC is **+5V** and you can attach TRIG and ECHO pin to any Digital I/O in your Arduino Board.



## 2. Explore PIR sensor for motion detection and Integrate it with Arduino UNO

The output of PIR motion detection sensor can be connected directly to one of the Arduino (or any micro-controller) digital pins. ... PIR modules have a passive infrared sensor that detects the occupancy and movement from the infrared radiated from human body.

Most PIR sensors have 3-pins: VCC, GND and OUT. VCC and GND are to power the module (Operating voltage: DC 5V to 20V). The OUTPUT pin is the one which communicates with the micro-controller by sending digital pulse high (3.3v) when a motion is detected and digital low (0v) when no motion is detected.



### 3. Explore servo motor and integrate it with Arduino UNO

Servo motors have three wires: power, ground, and signal. The power wire is typically red, and should be connected to the 5V pin on the Arduino board. The ground wire is typically black or brown and should be connected to a ground pin on the board. The signal pin is typically yellow, orange or white and should be connected to pin 9 on the board.

