# ARTS

(Advance Road Transportation System)

Components Used

1. IR Sensors

* IR detectors are specially filtered for Infrared light, they are not good at detecting visible light. On the other hand, photocells are good at detecting yellow/green visible light, not good at IR light
* IR detectors have a **demodulator** inside that looks for modulated IR at 38 KHz. Just shining an IR LED wont be detected, it has to be PWM blinking at 38KHz. Photocells do not have any sort of demodulator and can detect any frequency (including DC) within the response speed of the photocell (which is about 1KHz)
* IR detectors are digital out - either they detect 38KHz IR signal and output low (0V) or they do not detect any and output high (5V). Photocells act like resistors, the resistance changes depending on how much light they are exposed to

1. Flame Sensor

* A flame detector is a sensor designed to detect and respond to the presence of a flame or fire, allowing flame detection. Responses to a detected flame depend on the installation, but can include sounding an alarm, deactivating a fuel line (such as a propane or a natural gas line), and activating a fire suppression system.
* When used in applications such as industrial furnaces, their role is to provide confirmation that the furnace is working properly; in these cases they take no direct action beyond notifying the operator or control system. A flame detector can often respond faster and more accurately than a smoke or heat detector due to the mechanisms it uses to detect the flame

1. Gas Sensor

* A **gas sensor** is a device which detects the presence or concentration of gases in the atmosphere.
* Based on the concentration of the gas the sensor produces a corresponding potential difference by changing the resistance of the material inside the sensor, which can be measured as output voltage. Based on this voltage value the type and concentration of the gas can be estimated.

1. Alcohol Sensor

* An **alcohol sensor** detects the attentiveness of **alcohol** gas in the air and an analog voltage is an output reading.
* The **sensor** can activate at temperatures ranging from -10 to 50° C with a power supply is less than 150 Ma to 5V. The **sensing** range is from 0.04 mg/L to 4 mg/L, which is suitable for breathalyzers.

1. Push Button
2. LEDs
3. Jumping Wires
4. NodeMCU ESP8266

* NodeMCU is an open-source firmware and development kit that helps you to prototype or builds IoT products. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.
* The firmware uses the Lua scripting language. It is Built on C Programming. It is based on the eLua project and built on the Espressif Non-OS SDK for ESP8266.

1. Arduino Uno Atmega 328p

* The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.
* It contains everything needed tosupport the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDIUSB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.