

# Arduino



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## **INTRODUCTION**

In this brief report we will discuss a family of electronic boards called Arduino. At the beginning we shall provide an overview of the Arduino boards and what they are. After that we will tackle the board's components and how the board works. Finally an example of one of the applications will be shown.

## **WHAT IS AN ARDUINO?**

An Arduino board is simply a microcontroller board. The board is designed with the purpose of facilitating the use of electronics in projects. The use of the board was intentionally made easy so that anyone can use it.

The board comes with a software called the Arduino Integrated Development Environment. The software is used to program the Arduino board to do the required operations. An Arduino board receives inputs from different sensors and responds by controlling different types of actuators. It is also worth-mentioning that the board and its software are open-source. It means that anyone can do anything with the board and its software. This nature has made the Arduino boards very popular among users because everyone can innovate with the board and share their innovations.

However, this nature has also allowed clones with inferior qualities to be sold under the Arduino name.

## **COMPONENTS**

There are many types of Arduino boards. Some components vary from type to type, but a simple Arduino board that can be built at home have the following components:

1. An Atmel Microcontroller.
2. LEDs.
3. Resistors.
4. Capacitors.
5. Clock Crystal.
6. Switch
7. Voltage regulator.
8. Connection pins.
9. Diode.
10. Transistors.

An Arduino board's capabilities can be extended by the use of shields. Arduino shields are boards that can be mounted on the Arduino board to perform different tasks.

For example the Xbee shield allows multiple Arduino boards to communicate wirelessly, the motor shield allows the Arduino board to control a DC motor.

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## **HOW IT WORKS**

In general, a code is put in the memory of the board and then processed in the microcontroller. This code interacts with inputs and outputs. Inputs can be signals coming from sensors (light, voice, heat, etc. ) or results from another processed task. After processing the inputs in the microcontroller and applying the codes from the memory, the result comes in an output form (alarm, light, etc. ).

Codes are written in the memory by connecting the Arduino board to a computer. Connecting the Arduino board requires the use of an ICSP header <https://assignbuster.com/arduino/>

or a USB cable such as the one found in the newer versions e. g. Arduino UNO (see figure 1). An Arduino board can be powered from a USB cable, an ACDC adapter or a battery by connecting it in the Gnd and Vin pins. Figure 1: Connect Arduino by USB

## EXAMPLE OF APPLICATION

**Blinking LED** In this example, we will use the Arduino board like a timer to turn a LED on for 1 second and off for another second. To do this function see the code below;

```
Example Blinking LED
const int LED = 13;
void setup () { pinMode(LED, OUTPUT); }
void loop() { digitalWrite(LED, HIGH);
delay(1000); digitalWrite(LED, LOW); delay(1000); }
```

The First line written after // is a comment that does not affect the program. In the second line, we define the constant attached to pin 13 as LED. After attaching the LED to the pin, we decide whether the LED should be an input or an output, in this case, we chose output. Next, we write the processing code, (digitalWrite(LED, HIGH);) this means to provide voltage to the LED, (delay(1000);) means waiting 1000ms, (digitalWrite(LED, LOW);) means cutting off the voltage, (delay(1000);) the same process, which is waiting 1s. This code will be repeated in a loop.

## CONCLUSION

An Arduino board can be a great starting point for anyone interested in microcontrollers. The board is easy to use and has a wide variety of applications. There are many tutorials available in the world web for the board due to its popularity. Although the board has many advantages, it still has its own limitations.

## **REFERENCE [**

1. Arduino site, (<http://arduino.cc/en/>)
2. ]Simply Arduino, Eng. Abdullah Ali Abdullah, ([http://simplyarduino.com/?page\\_id=5](http://simplyarduino.com/?page_id=5))