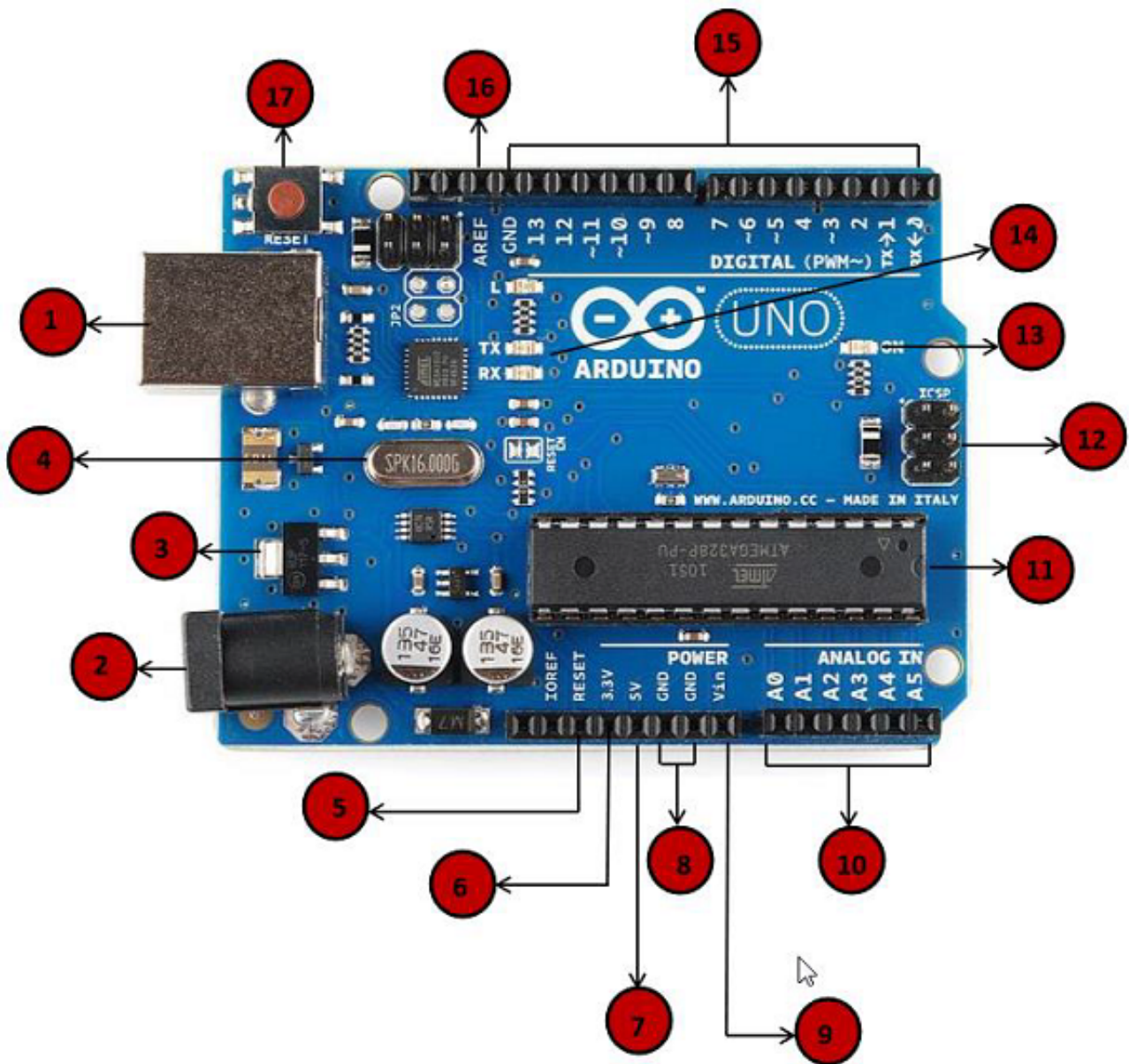# ARDUINO UNO BOARD
DESCRIPTION & INSTALLATION

BOARD DESCRIPTION

1. Power USB
Arduino board can be powered by using the USB cable from your Computer.

2. Power (Barrel Jack)
Arduino board can be powered directly from AC main power supply by connecting it in the Barrel Jack.

3. Voltage Regulator
The function of the Voltage Regulator is to control the Voltage given to the Arduino board and stabilise the DC Voltages used by the Processor.

4. Crystal Oscillator
The Crystal Oscillator helps Arduino in dealing with time issues. The Arduino is calculating time by using it. The number printed on top of the Arduino Crystal is 16.000H9H, which means that the frequency is 16MHz.

5. 17. Arduino Reset
You can Reset your Arduino board, i.e., start your program from the beginning. You can do this by connecting an external reset button to the Arduino pin labelled RESET (5), or by using the RESET Button(17).

6. 7. 8. 9. Pins (3.3, 5, GND, Vin)
- 3.3V (6) - Supply 3.3 output volt
- 5V (7) - Supply 5 output volt
- Most of the components used with Arduino board works fine with 3.3 & 5 volt.
- GND (8) (Ground) - There are several GND pins on the Arduino, any of which can be used to ground your circuit.
- Vin (9) - This pin also can be used to power the Arduino board from an external power source like AC mains power supply.

10. Analog Pins
The Arduino UNO board has five analog input pins A0 through A5. These pins can read the signal from an analog sensor like the humidity sensor or temperature sensor and convert it into a digital value that can be read by the microprocessor.

11. Main microcontroller
Each Arduino board has his own microcontroller. You can assume it as the brain of your board.The main IC(integrated circuit) on the Arduino is slightly different from board to board. The microcontrollers are usually of the ATMEL Company. You must know what IC your board has before loading up a new program from the Arduino IDE. You can find it on the top of the IC. For more details about the IC construction and functions you can refer to the data sheet.

12. ICSP Pin

Mostly, ICSP is an AVR, a tiny programming header for the Arduino consisting of MOSI, MISO, SCK, RESET, VCC and GND. It's often referred to as an SPI(Serial Peripheral Interface), which could be considered as an "expansion" of the output. Actually you are slaving the output device to the master of the SPI bus.

13. Power LED Indicator

This LED should light up when you plug your Arduino into a power source to indicate that your board is powered up correctly. If this light doesn't turn on, then there is something wrong with the connection.

14. TX & RX LEDs

On your board, you will find two labels: TX (transmit) & RX (receive). They appear in two places on the Arduino UNO board. 1st, at the digital pins 0 & 1, to indicate the pins responsible for serial communication. 2nd, the TX & RX led. The TX led flashes with different speed while sending the serial data. The speed flashing depends on the baud rate used by the board . RX flashes during the receiving process.

15. Digital I/O

The Arduino UNO board has 14 digital I/O pins, (of which 6 provide PWM (Pulse Width Modulation) output). These pins can be configured to work as input digital pins to read logic values (0 or 1) or as digital output pins to drive different modules like LEDs, relays, etc. The pins labeled "~" can be used to generate PWM.

16. AREF

AREF stands for Analog Reference. It's sometimes, used to set an external reference voltage (between 0 to 5 volts) as the upper limit for the analog input pins.

INSTALLATION

STEP 1: First you must have an Arduino Board & a USB Cable. The USB cable that we need for Arduino UNO is (A plug to B plug), the kind that you would connect a USB Printer. Some other Arduino Boards use a different USB cable.

STEP 2: Download the Arduino IDE software from the Download Page on the Arduino official website. You can get different of Arduino IDE there.

STEP 3: Power UP Your board

STEP 4: Launch Arduino IDE

STEP 5: Once the software starts, you have two options.
- Create a new Project :
File -> New

- Open an existing Project example:
File -> Examples -> Basics -> Blink | (our first LAB)

STEP 6: You have to Select your Arduino Board.
*Tools -> Board | (and we select our board)*

STEP 7: You have to select your serial port.
Tools -> Serial Port
You can find your serial port by disconnecting your Arduino board and re-open the menu, the entry that disappears should be of the Arduino board. Reconnect the board and select that serial port.

STEP 8: Upload the program to your board
Let's take a look and the symbols appearing in the Arduino IDE toolbar.
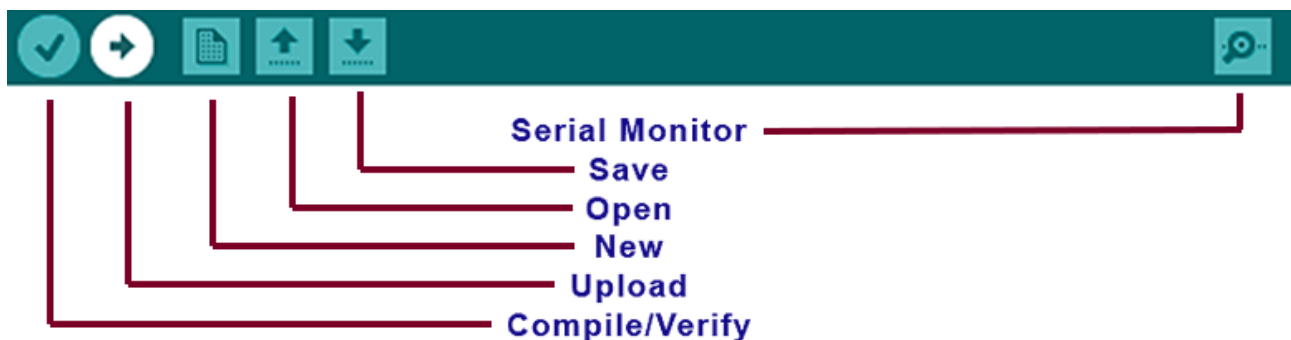
Now you are ready to Upload your first program.