

## Experiment - 1

**Aim** - Introduction to Arduino and its Interfacing.

**Objectives:**

1. To understand architecture and board layout of Arduino Microcontroller.
2. To perform Arduino IDE interfacing with PC for various applications.

**Components Required –**

1. Arduino Board
2. USB cable

**Circuit Diagram and Theory –**

**1. Diagram:**

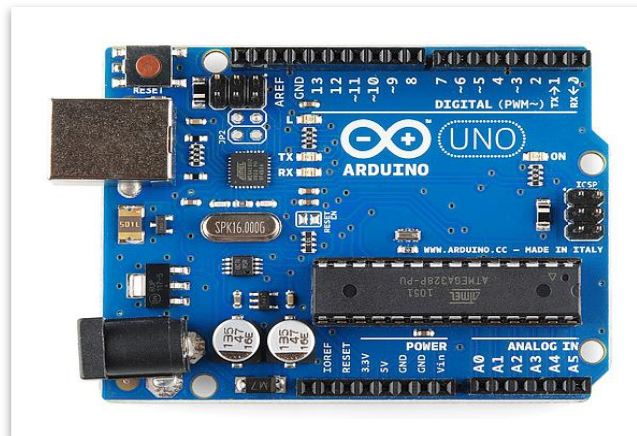
*A. Types of Arduino Board:*



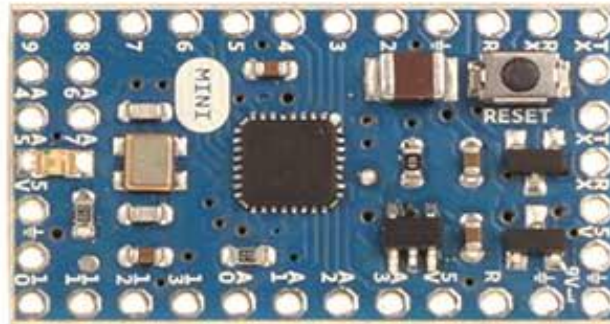
**Arduino Nano**



**Arduino Mega**



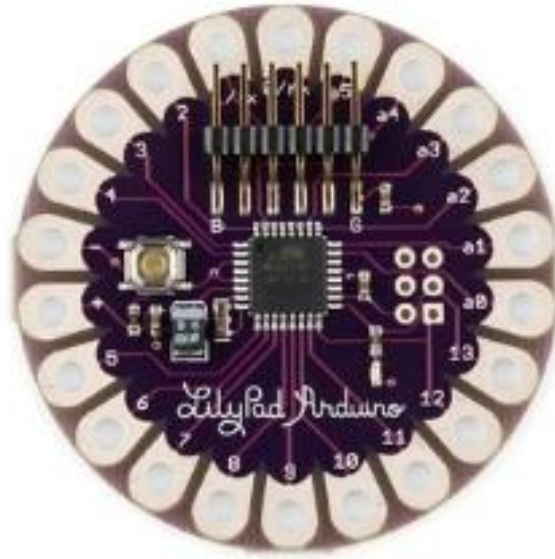
**Arduino Uno**



**Arduino Mini**

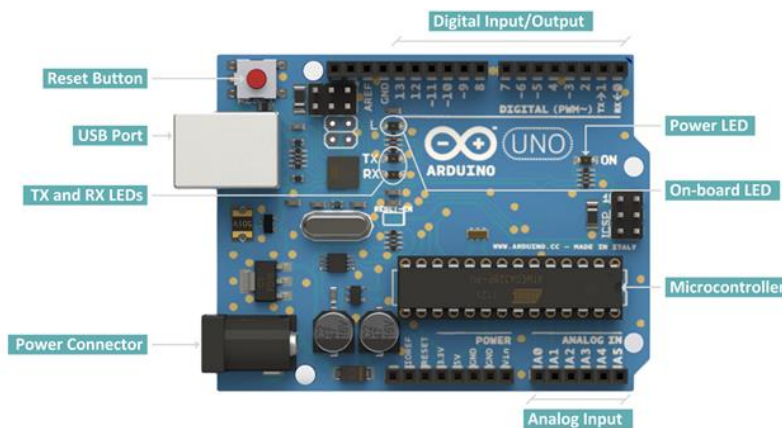


**Arduino Leonardo**



## Arduino LilyPad

### *B. A General Architecture of Arduino UNO Board:*



#### Digital pins:

14 digital IO pins

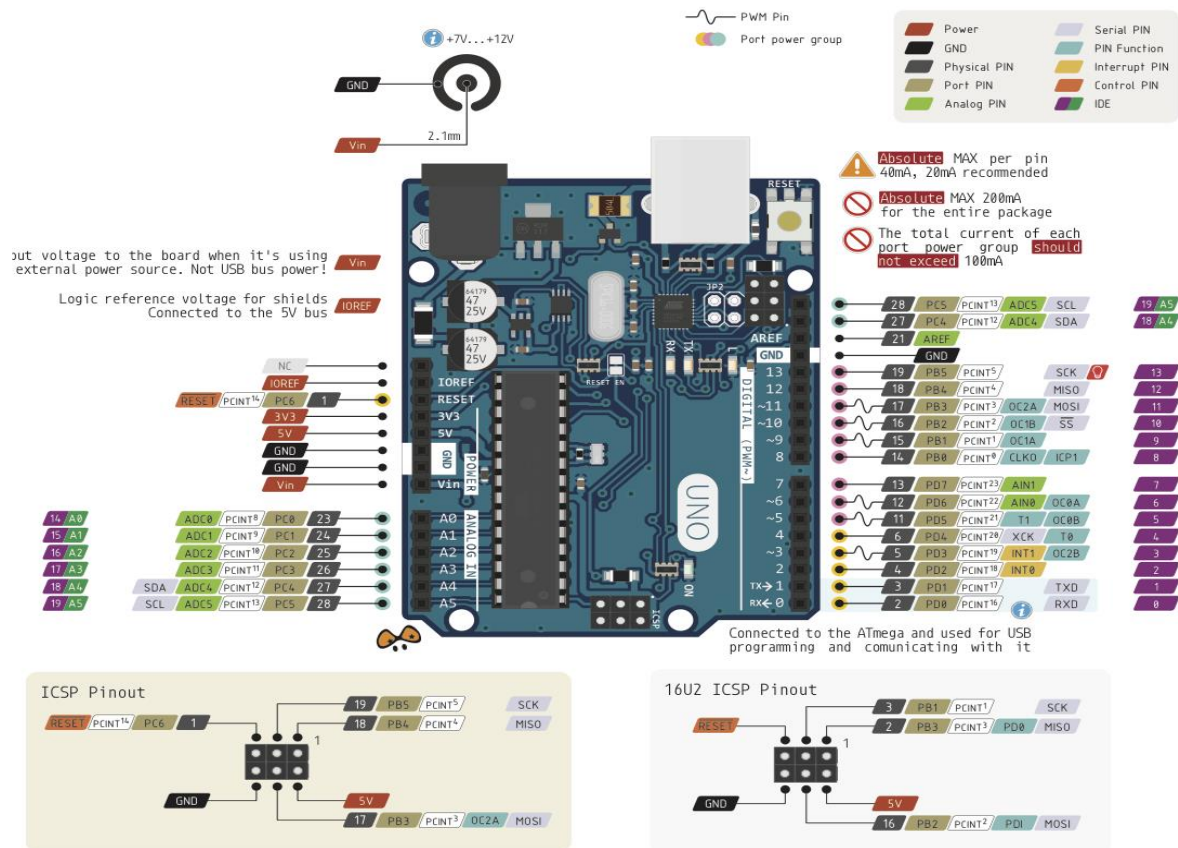
6 are PWM pins (3, 5, 6, 9, 10, and 11).

#### Analog pins:

6 analog pins(A0, A1, A2, A3, A4, and A5)

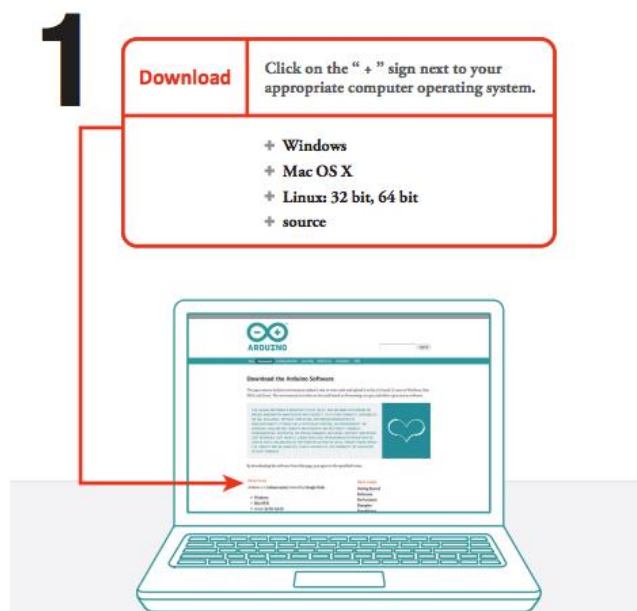
Takes analog values as an input

### C. A Complete Architecture of Arduino UNO Board:



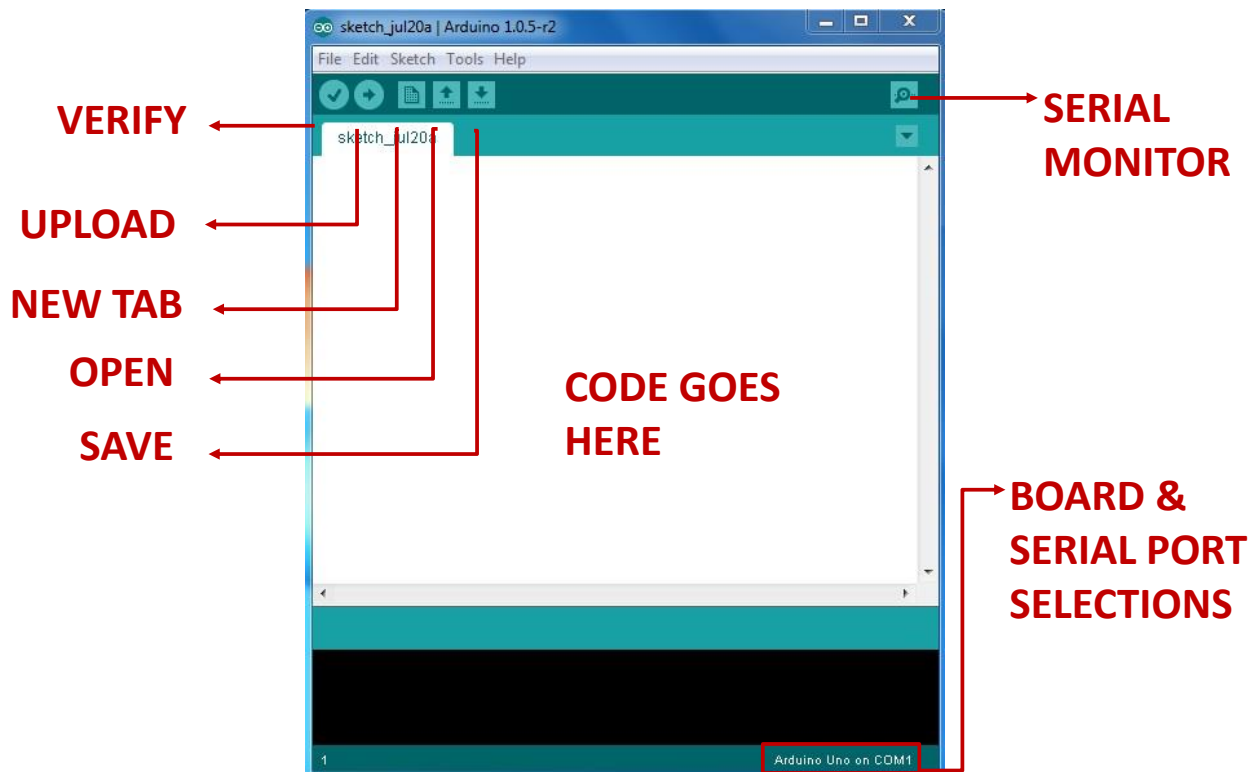
## 2. Arduino IDE Interface Steps:

a) Download Arduino IDE Software (Open Source Available) and install it:





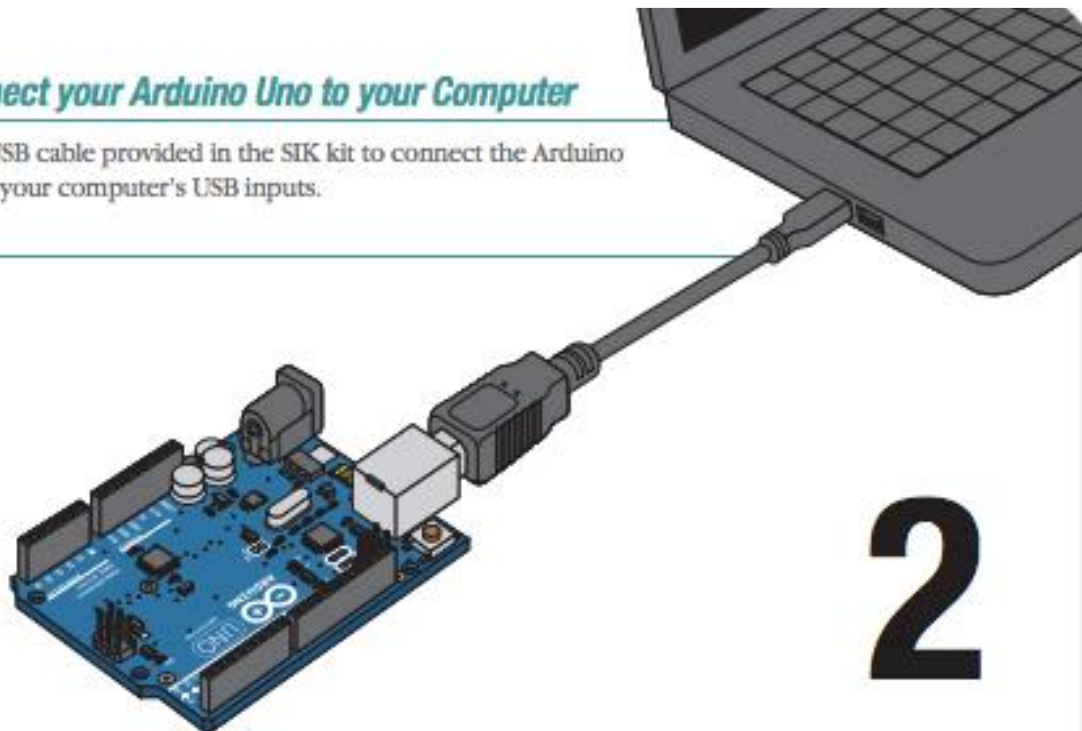
b) *Arduino IDE Interface module with PC*



c) *Connect Board to your Computer:*

**// Connect your Arduino Uno to your Computer**

Use the USB cable provided in the SIK kit to connect the Arduino to one of your computer's USB inputs.



*d) Install Arduino Drivers*

# 3

## // Install Drivers

Depending on your computer's operating system, you will need to follow specific instructions. Please consult the URLs below for specific instructions on how to install the drivers onto your Arduino Uno.

**\* You will need to scroll to the section labeled "Install the drivers".**



### Windows Installation Process

Go to the web address below to access the instructions for installations on a Windows-based computer.

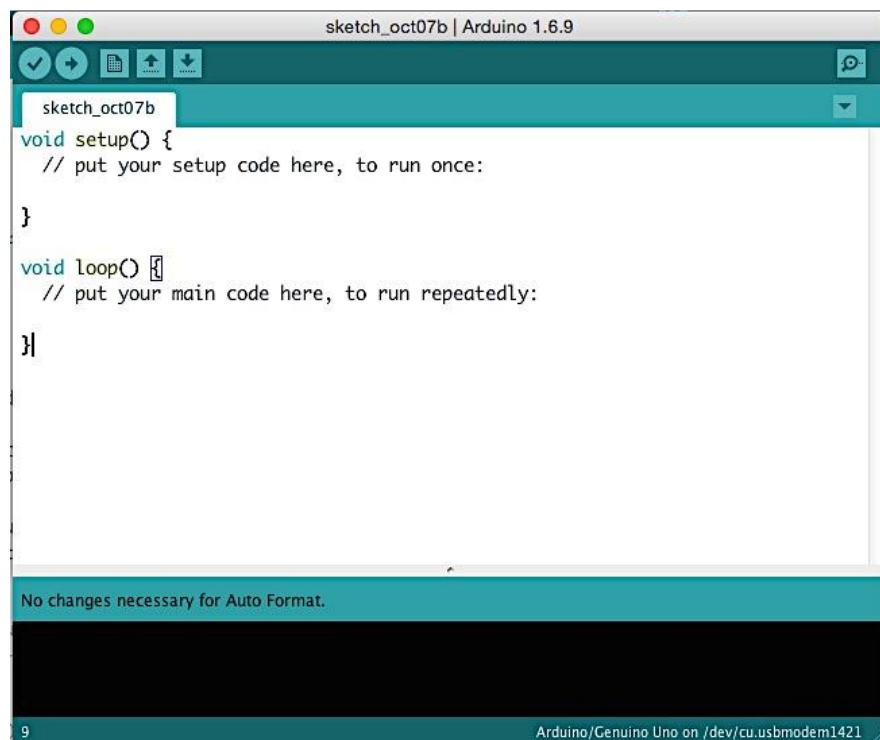
<http://arduino.cc/en/Guide/Windows>



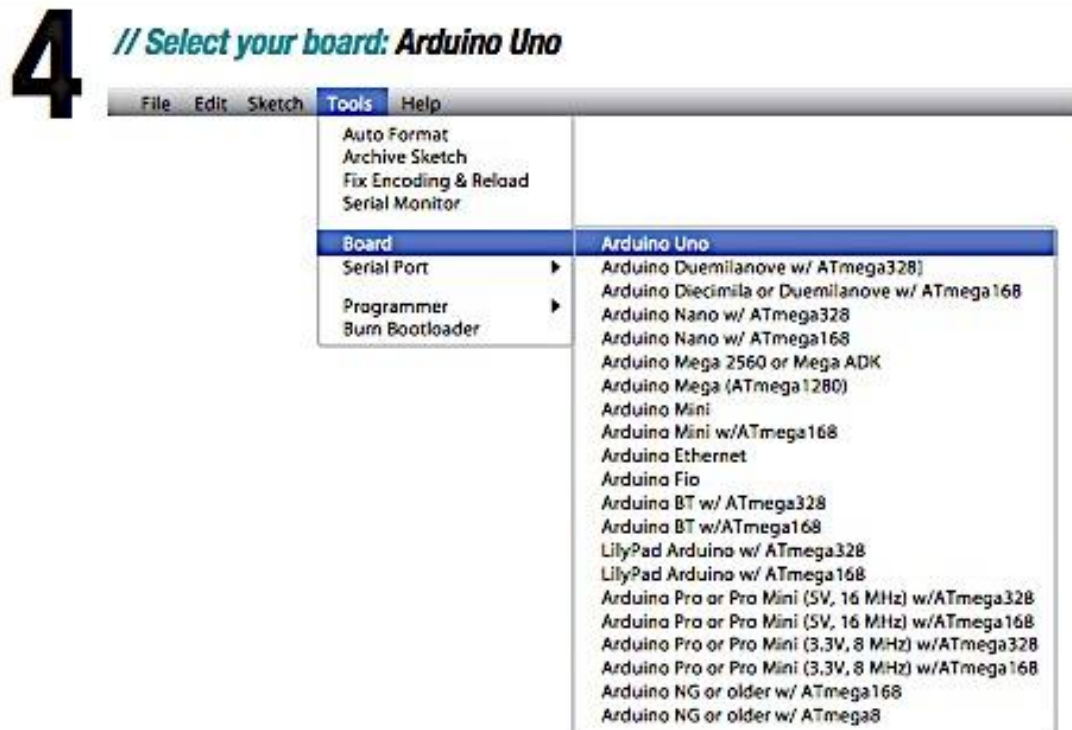
### Macintosh OS X Installation Process

Macs do not require you to install drivers. Enter the following URL if you have questions. Otherwise proceed to next page.

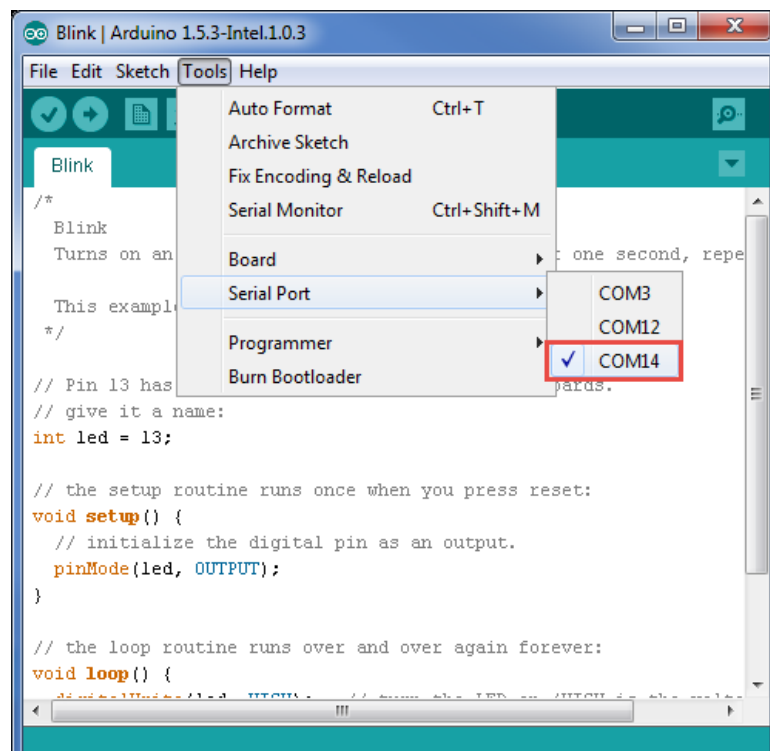
<http://arduino.cc/en/Guide/MacOSX>

*e) Open Arduino IDE*

f) Select your board:



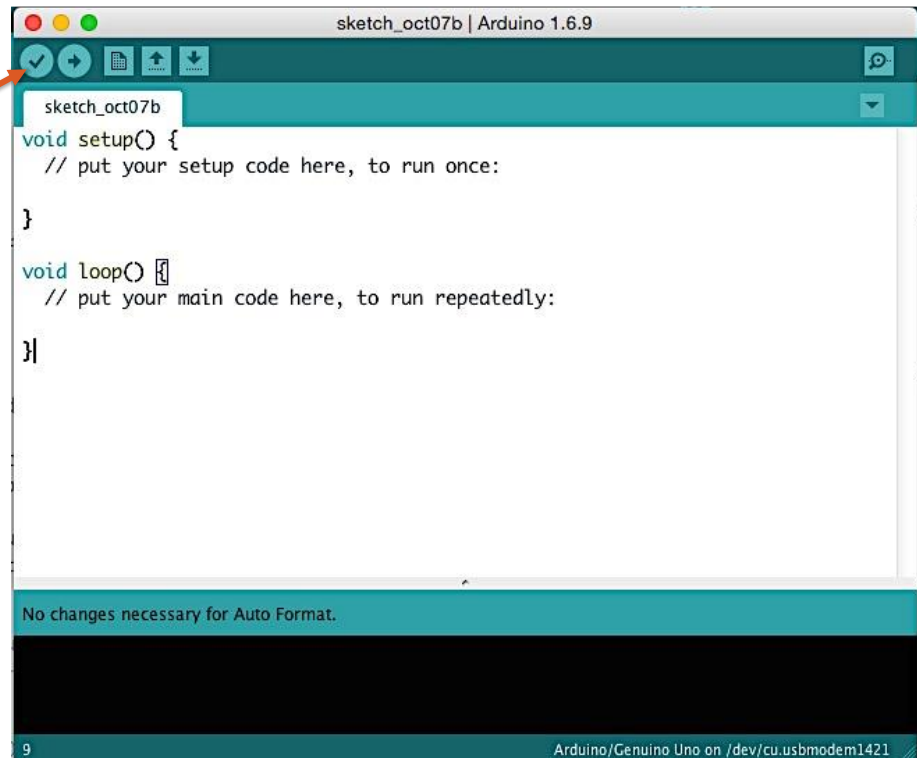
g) Select Serial Port



*h) Compiles your code by clicking compile button*

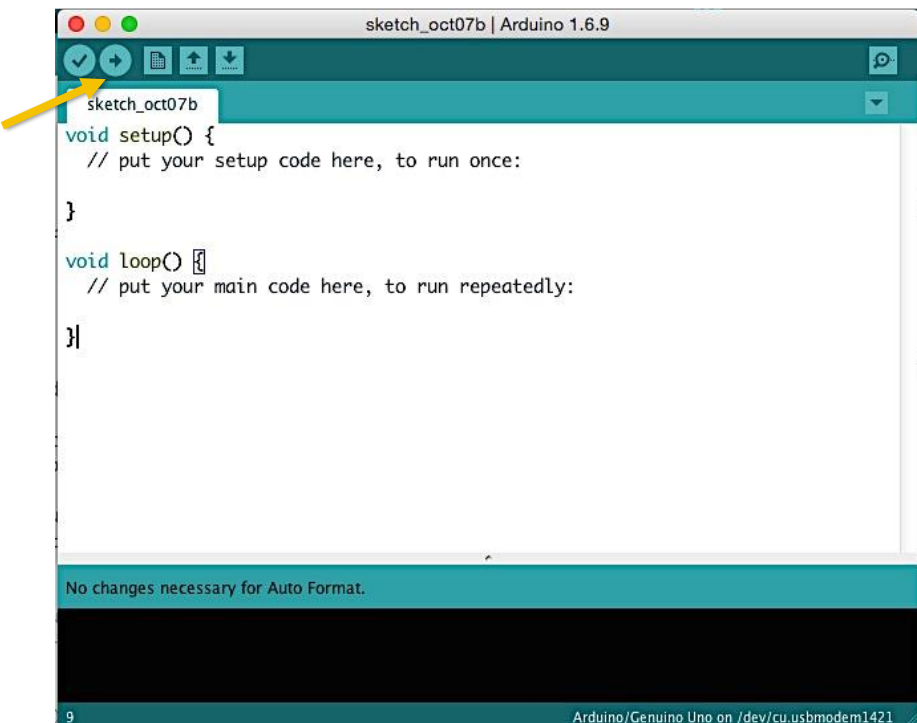
### Verify:

Compiles and approves your code. Will catch errors in syntax.



*i) Upload your code by clicking upload button:*

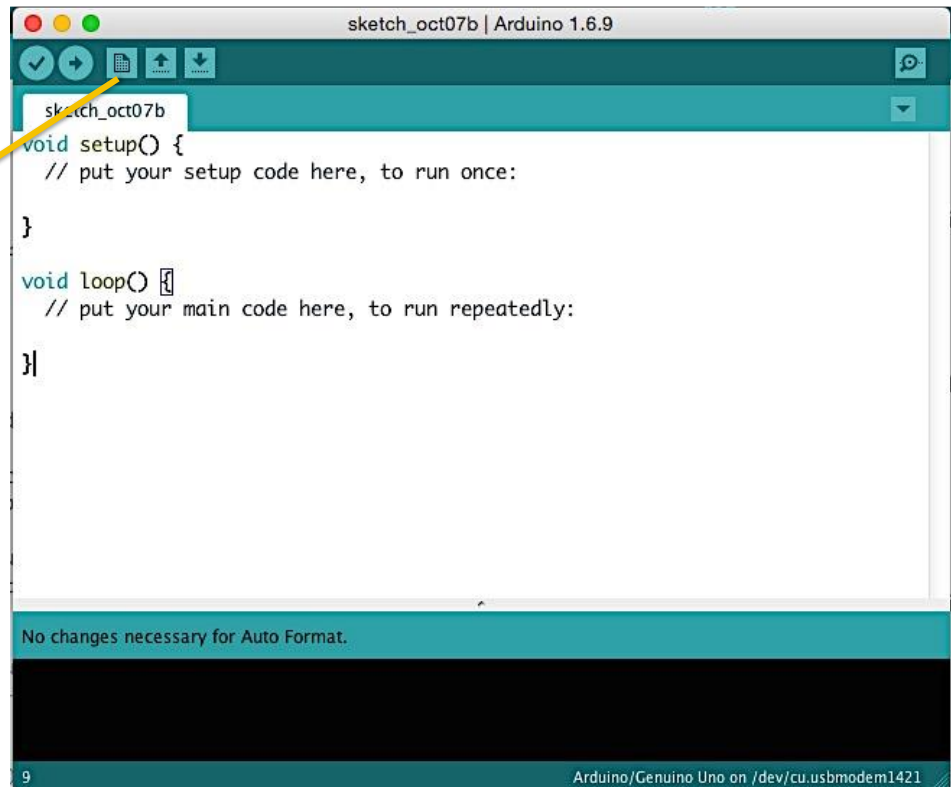
**Upload:** Sends your code to the Arduino Board. When you clicked it, you should see lights on your board blink rapidly.





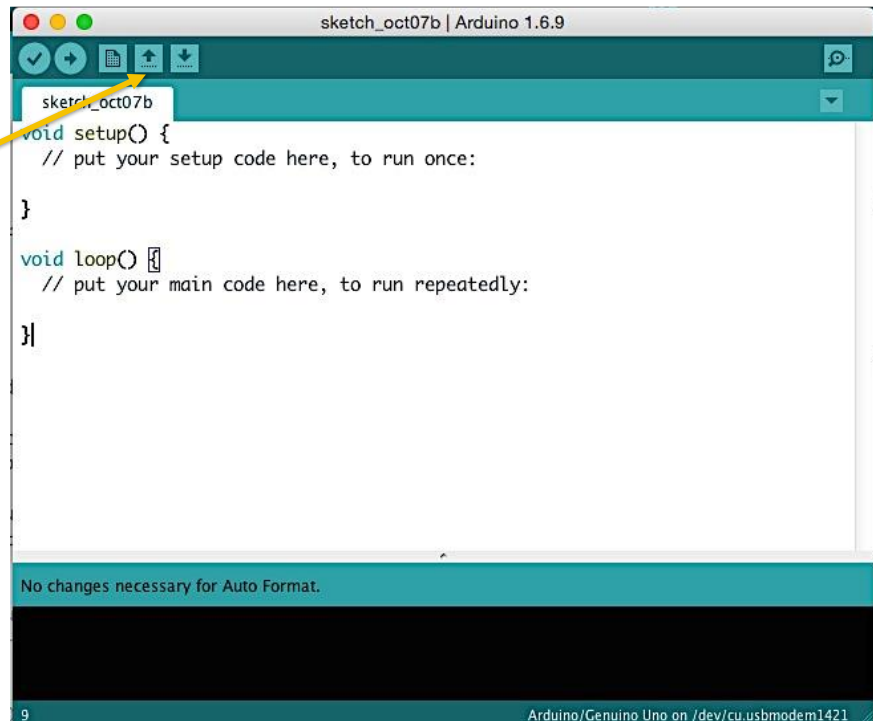
j) *Open new code window tab:*

**New:**  
Open-up a  
new code  
window tab.



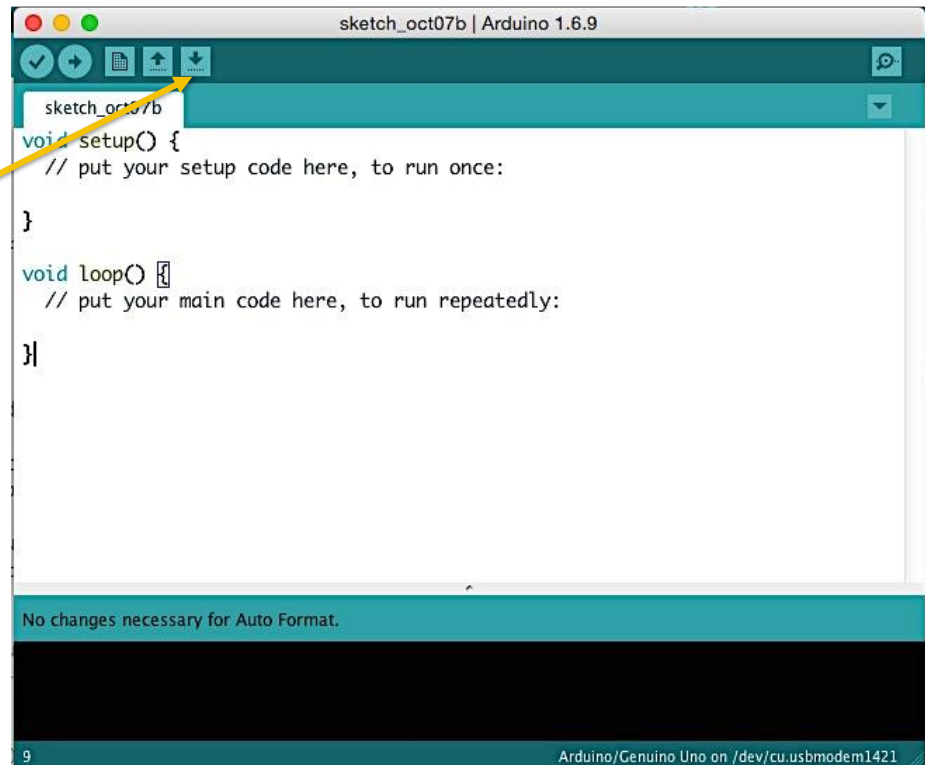
k) *Open existing sketch:*

**Open:** Open an  
existing sketch,  
which is where you  
write your code.



l) *Save the current sketch:*

**Save:** Saves the currently open sketch.



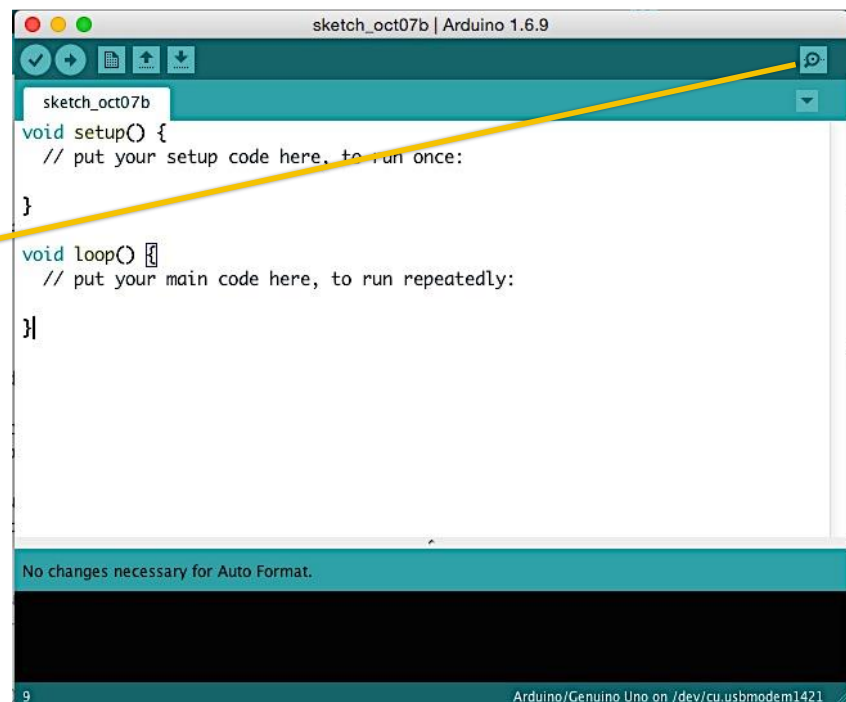
m) *Display any serial information:*

### Serial Monitor:

Opens a window that displays any serial info the Board is transmitting. Very useful for debugging.

### What is Serial?

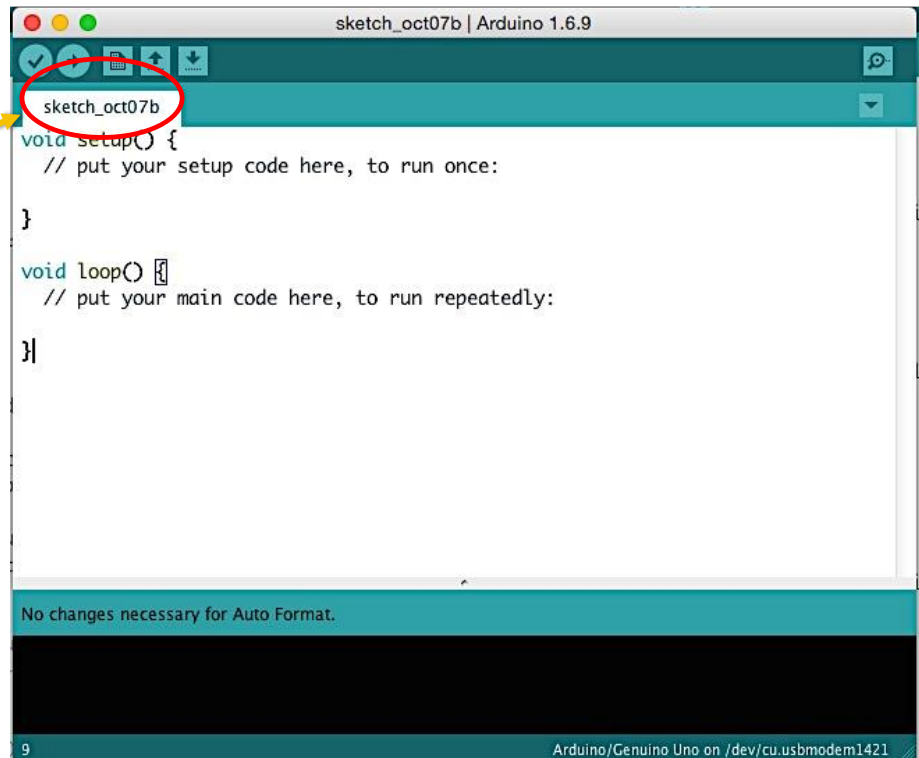
Process of sending data one bit (0 or 1) at a time.



n) *Your current sketch name:*

## Sketch

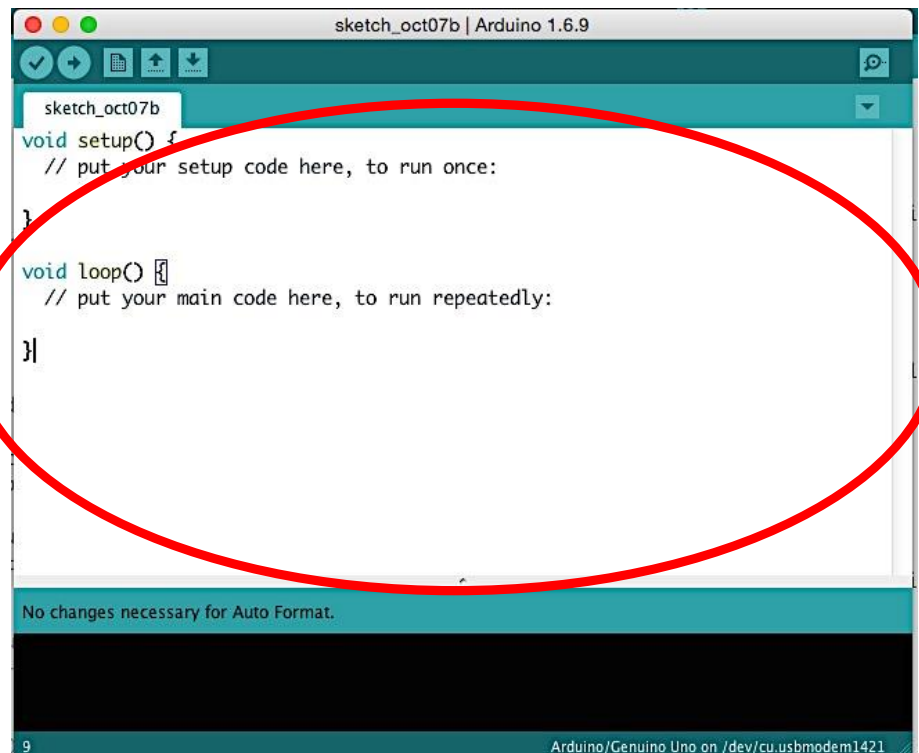
**Name:** Name of the sketch you are currently working on.



o) *Code composes area:*

## Code Area:

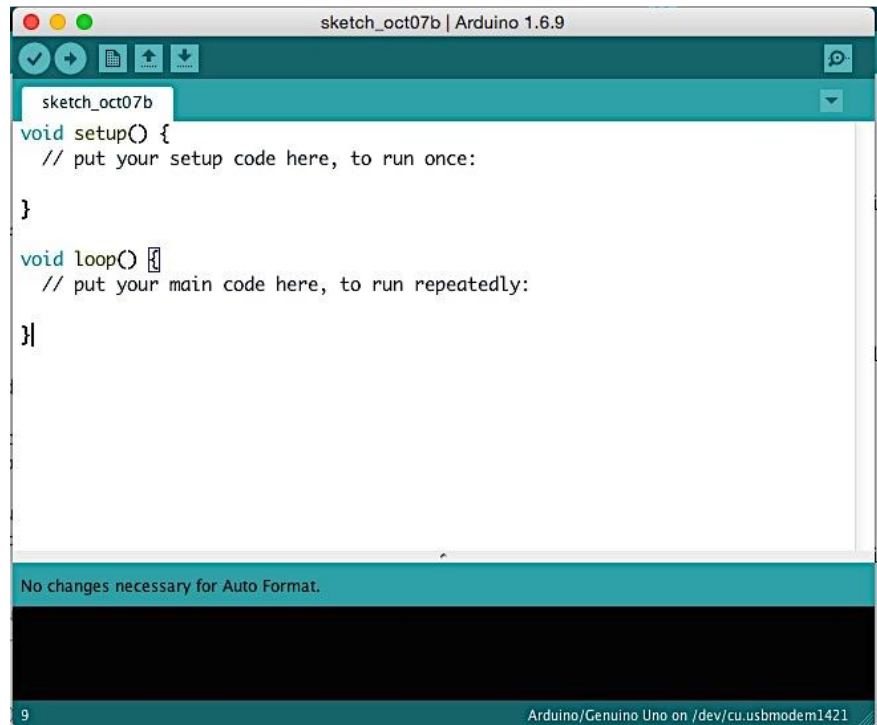
Area where you compose the code for your sketch.



p) Console area to show error in your code:

## Message

**Area:** Where the IDE tells you if there were any errors in your code.



**Additional Tasks** – No additional tasks

**Conclusions** – Students have successfully gained knowledge about how to interface Arduino with PC using the Arduino IDE module. To accomplish the experiment markable safety measures have been taken care of.