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.

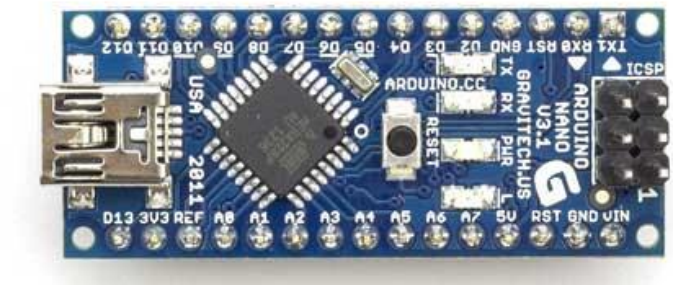
Components Required –

1. Arduino Board
2. USB cable

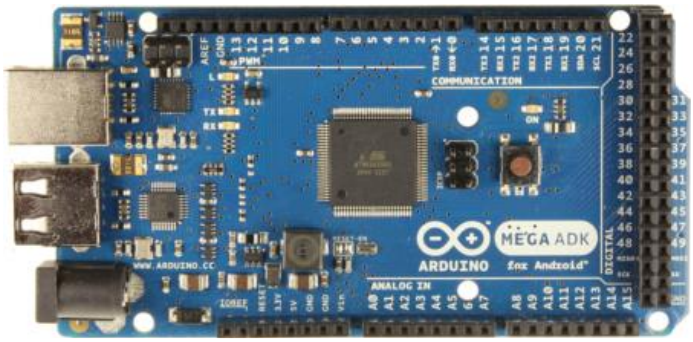
Circuit Diagram and Theory –

1. Diagram:

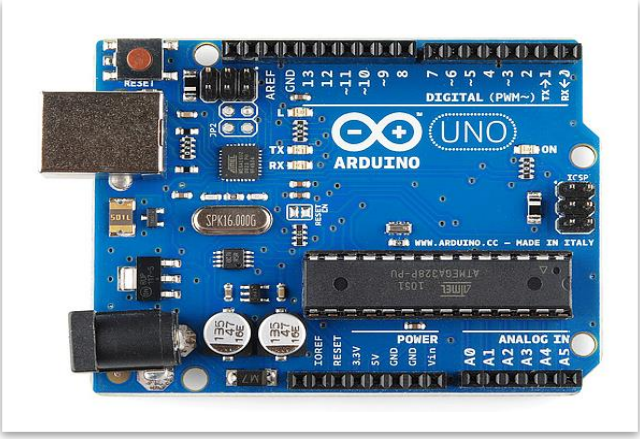
A. Types of Arduino Board:



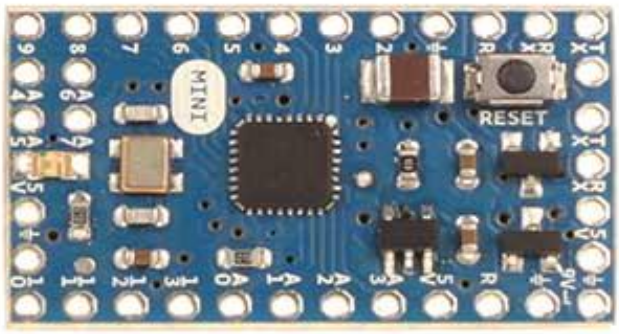
Arduino Nano



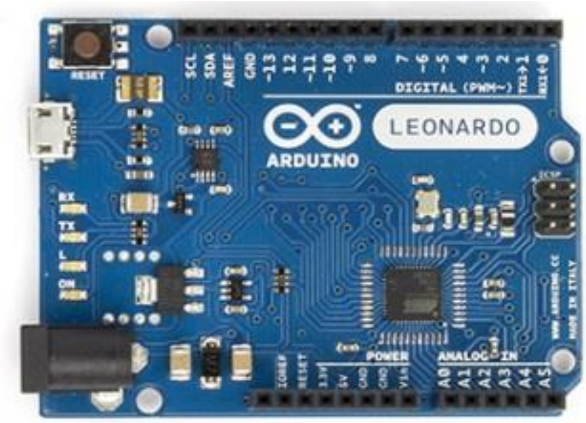
Arduino Mega



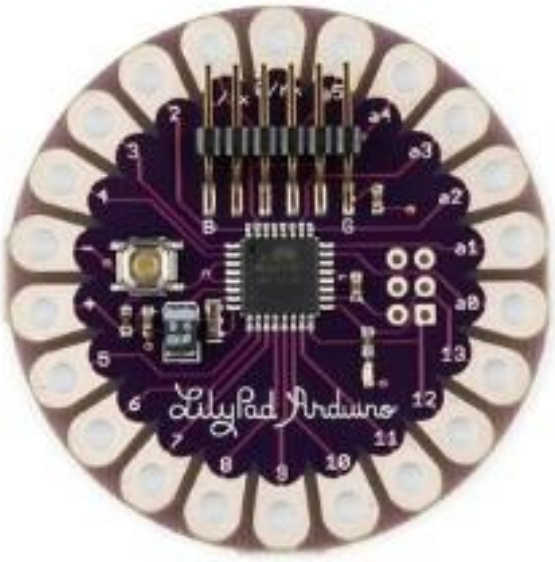
Arduino Uno



Arduino Mini

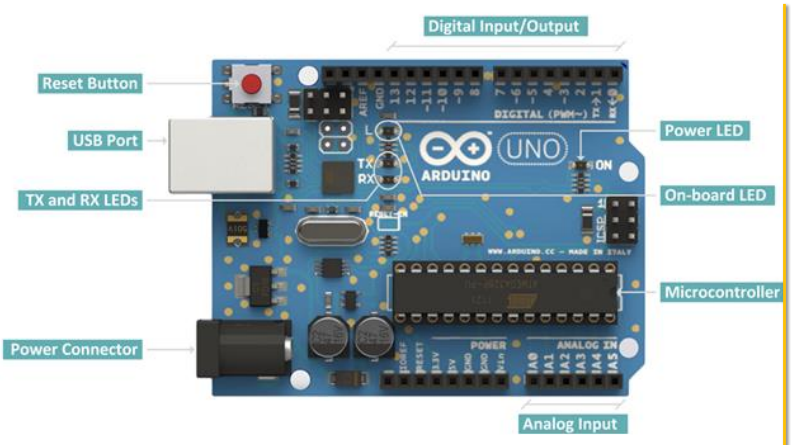


Arduino Leonardo



Arduino LilyPad

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



Digital pins:

14 digital IO pins

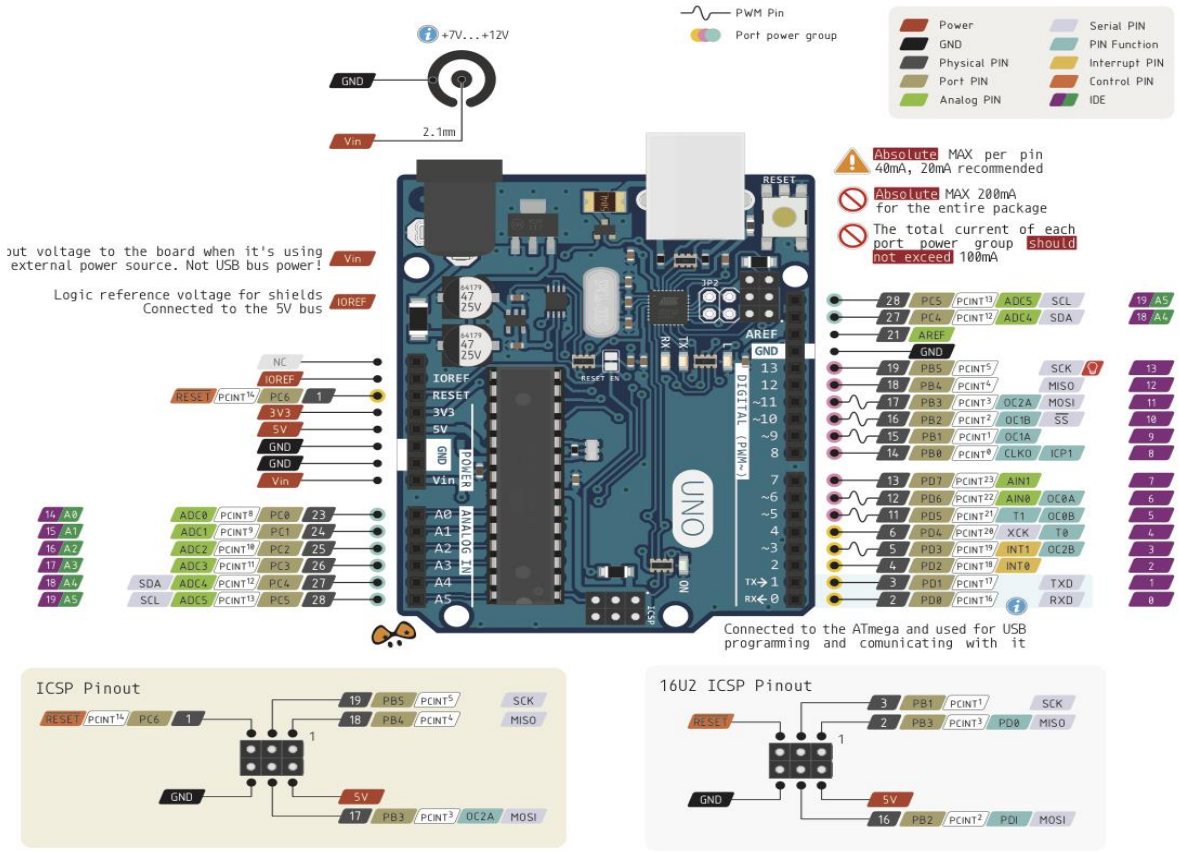
6 are PWM pins (3, 5, 6, 9, 10, and 11).

Analog pins:

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

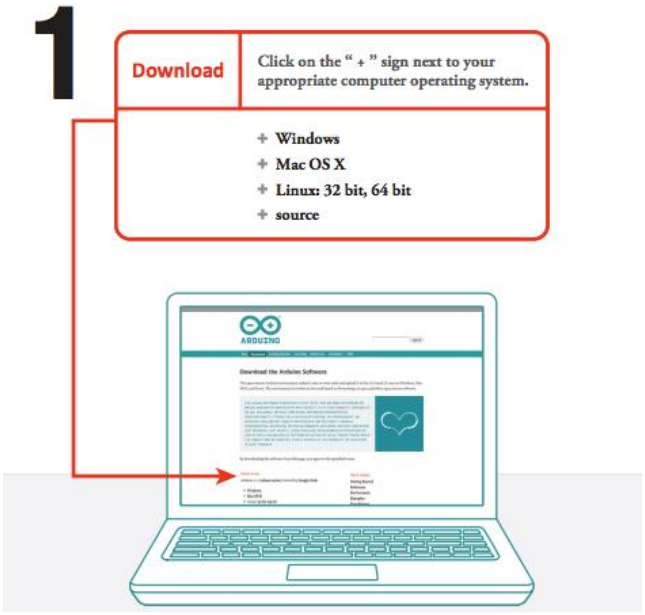
Takes analog values as an input

C. A Complete Architecture of Arduino UNO Board:

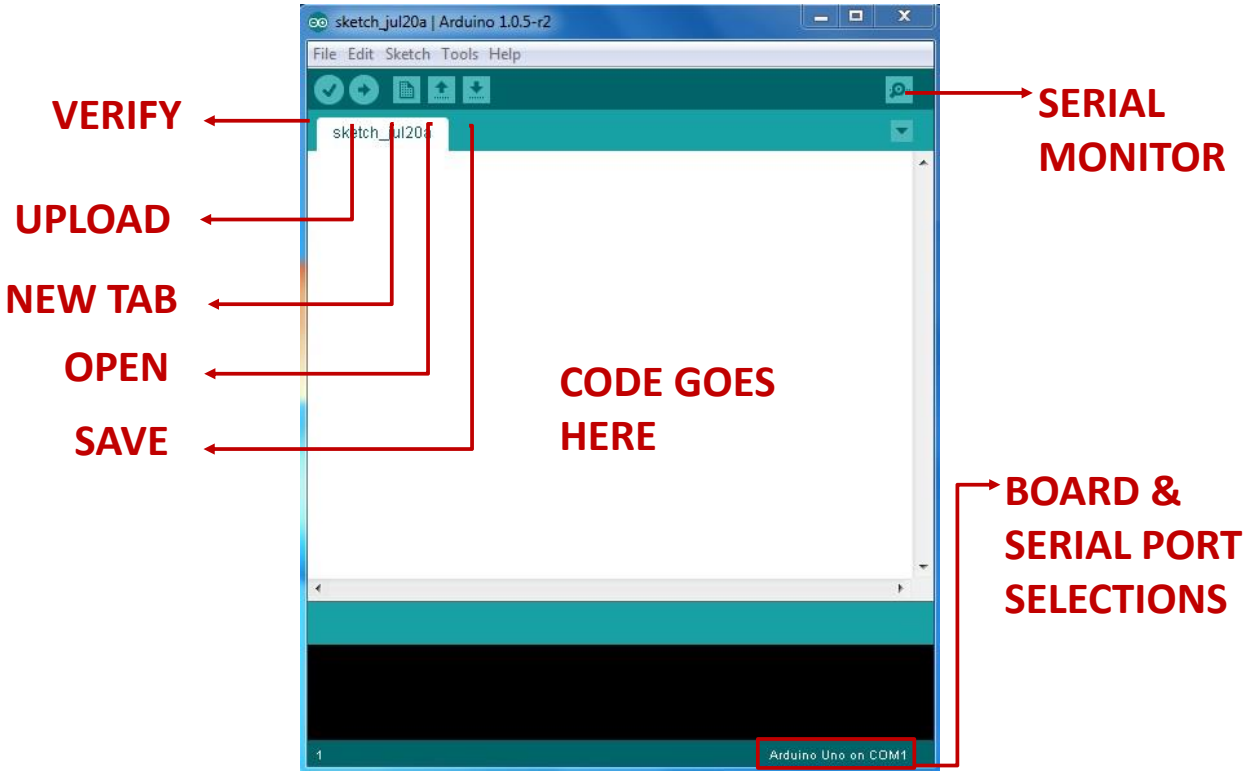


2. Arduino IDE Interface Steps:

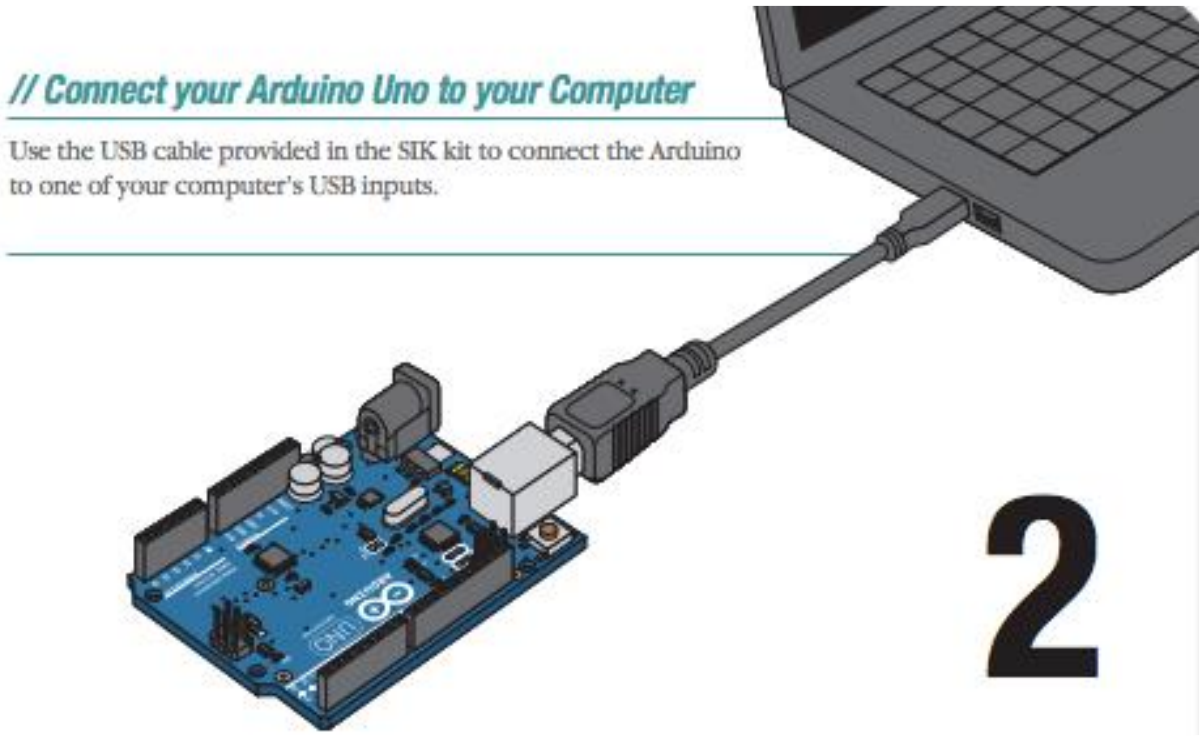
a) Download Arduino IDE Software (Open Source Available) and install it:



b) Arduino IDE Interface module with PC

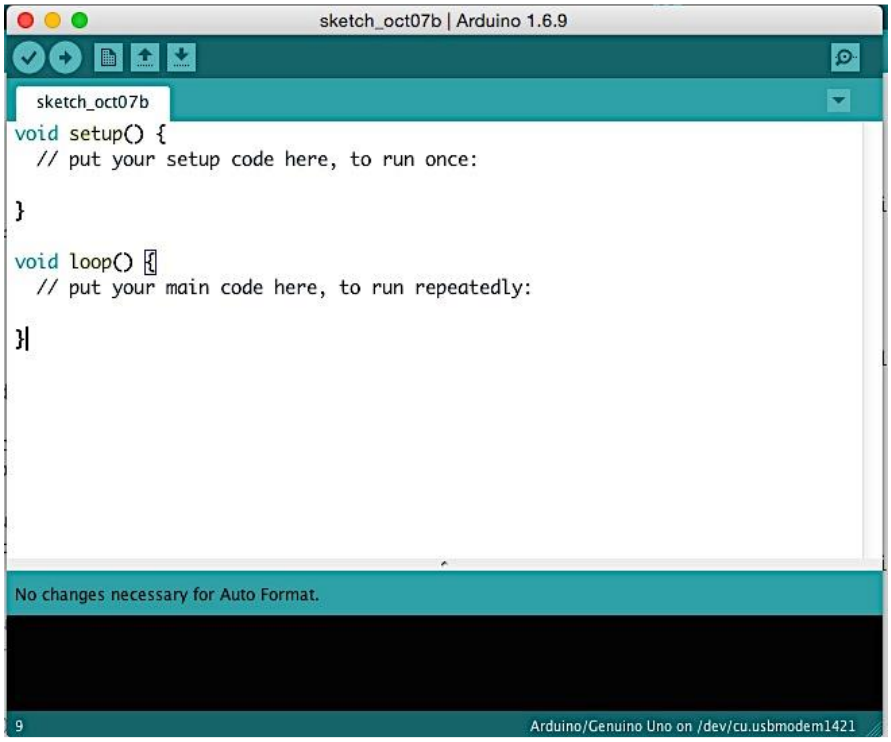


c) Connect Board to your Computer:

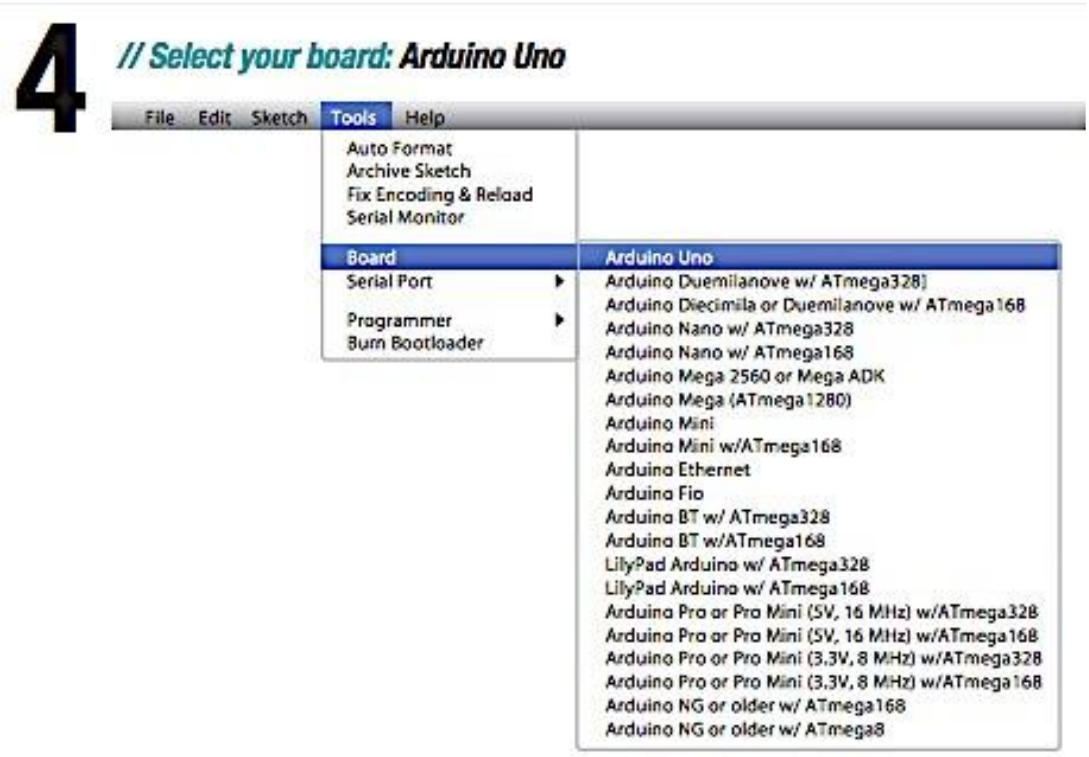


d) Install Arduino Drivers

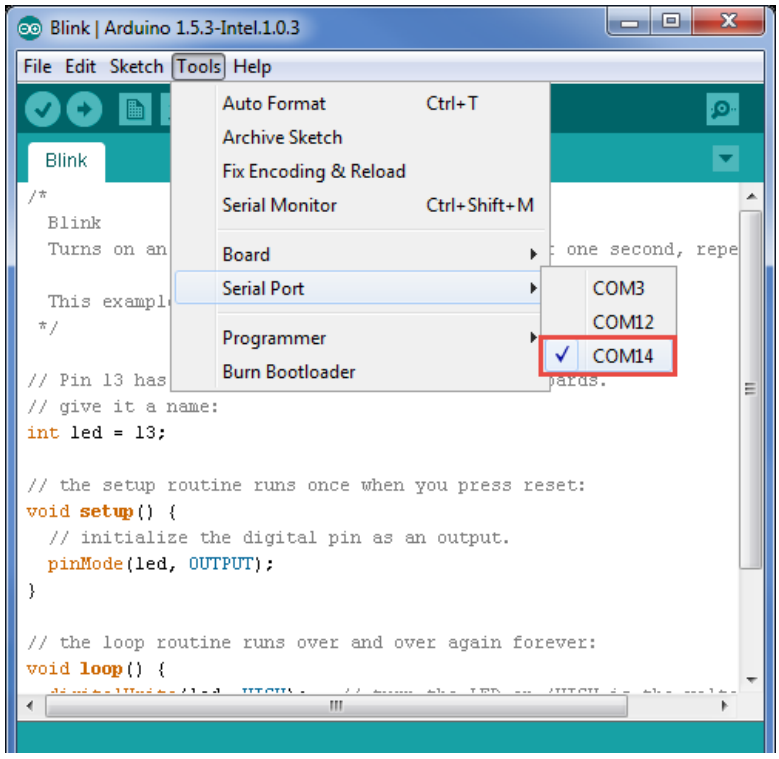
e) Open Arduino IDE



f) Select your board:

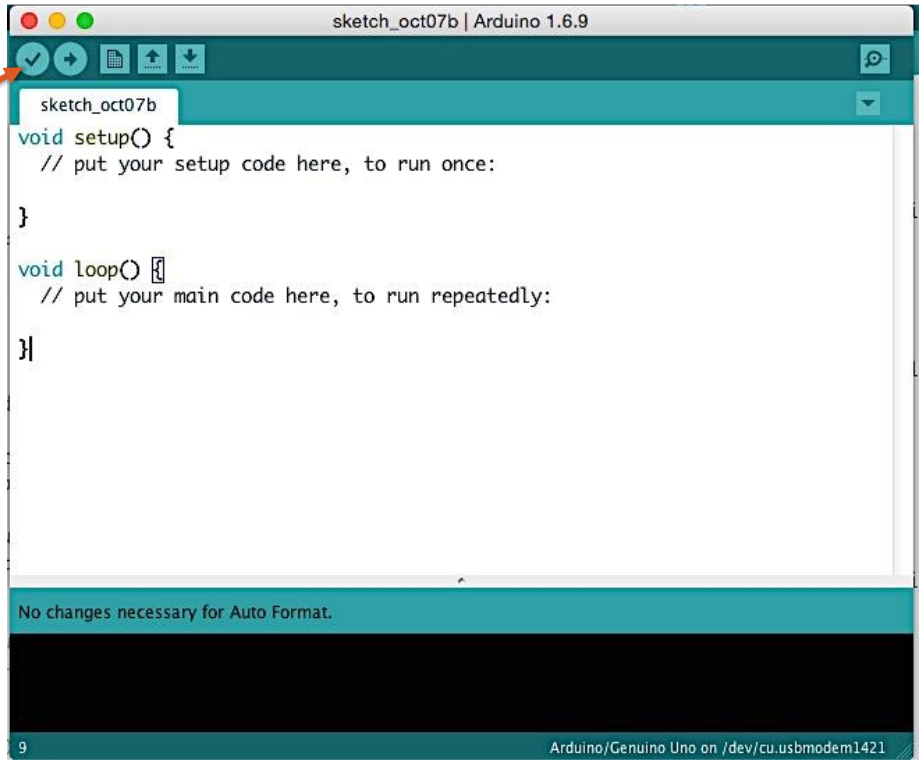


g) Select Serial Port



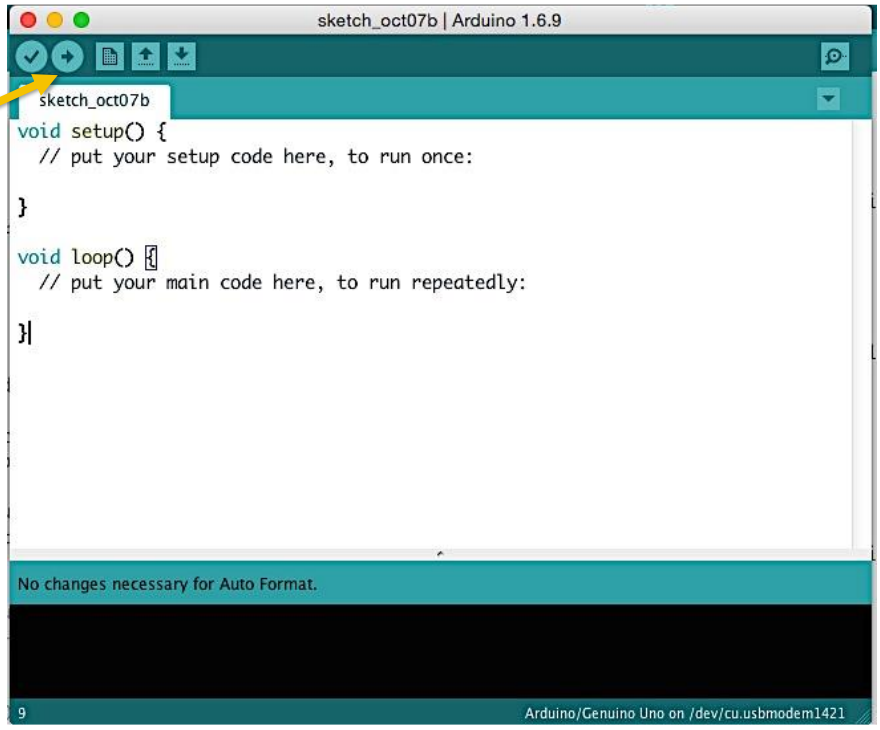
h) Compiles your code by clicking compile button

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



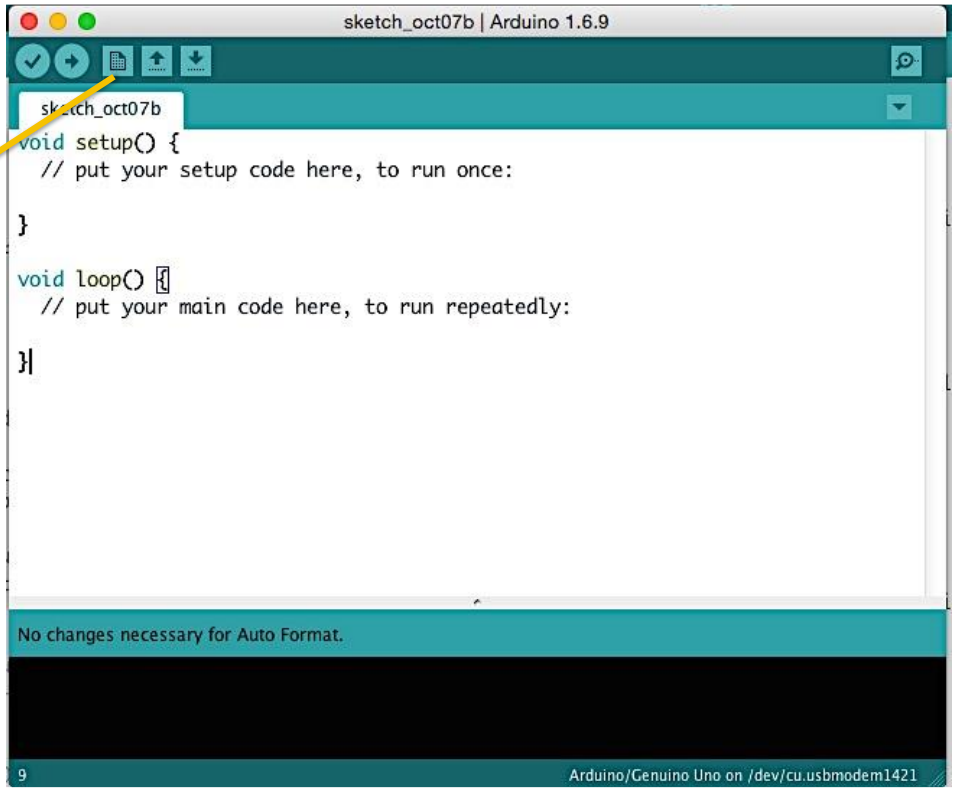
i) Upload your code by clicking upload button:

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



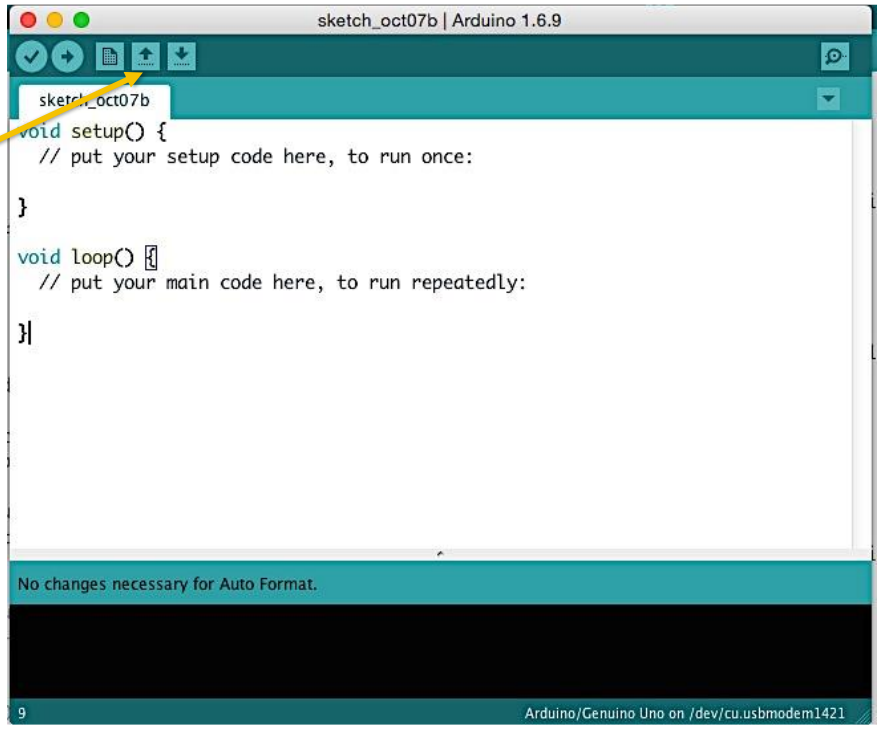
j) Open new code window tab:

New: Open-up a new code window tab.



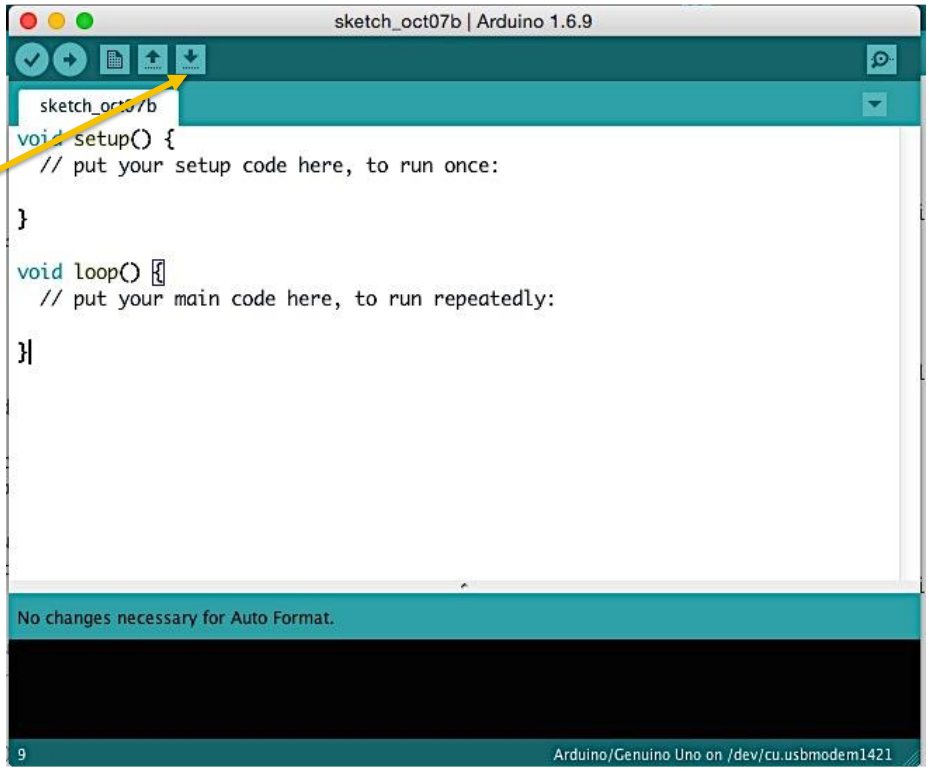
k) Open existing sketch:

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



l) Save the current sketch:

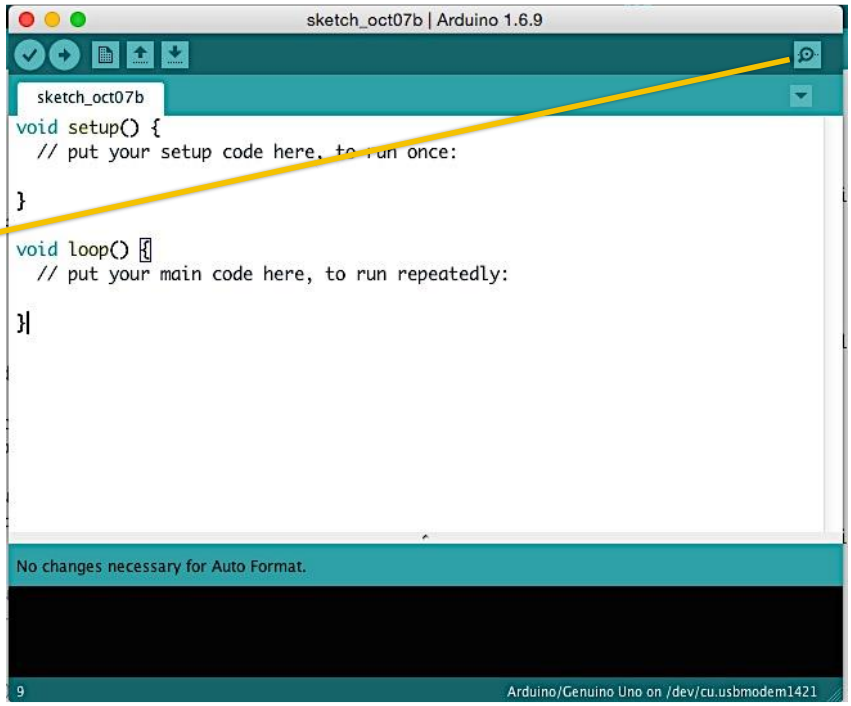
Save: Saves the currently open sketch.



m) Display any serial information:

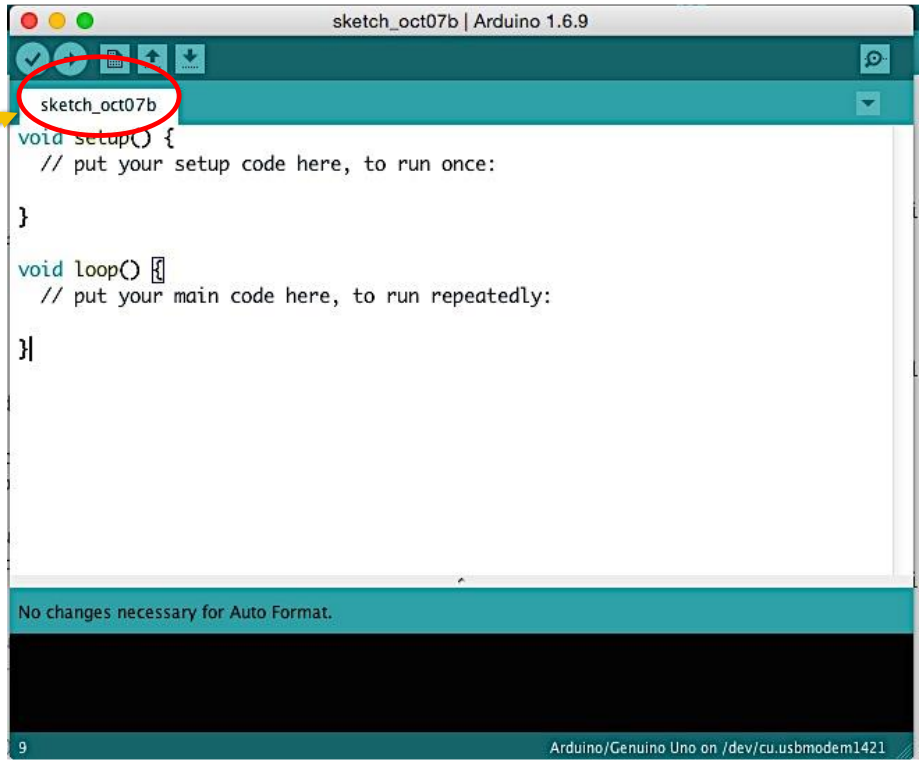
Serial Monitor:
Opens a window that displays any serial info the Board is transmitting. Very useful for debugging.

What is Serial?
Process of sending data one bit (0 or 1) at a time.



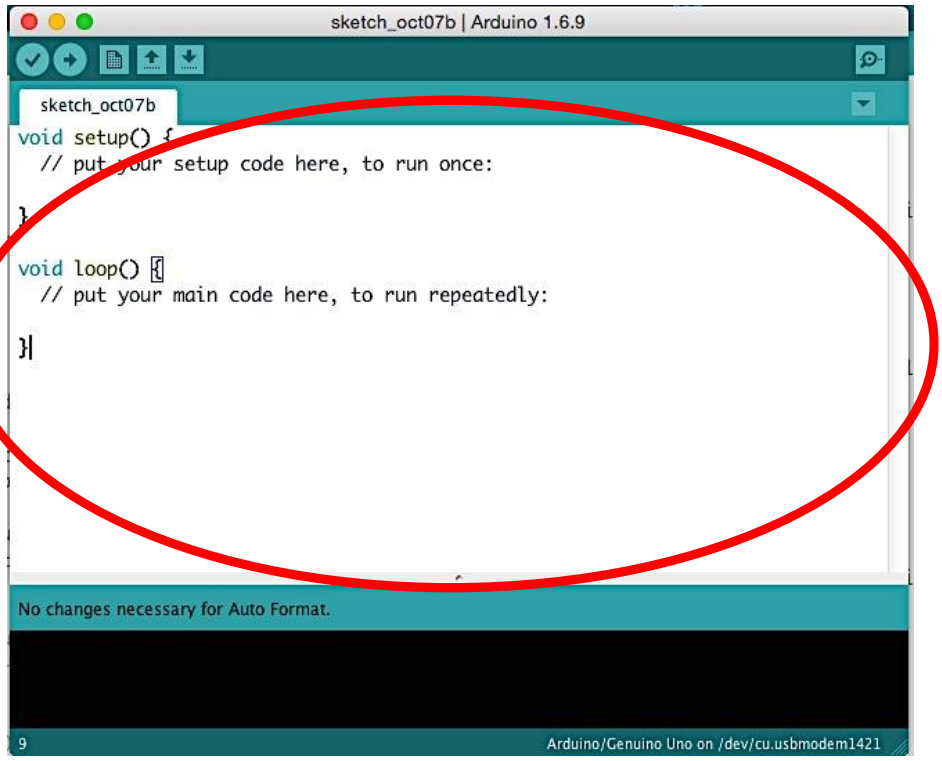
n) Your current sketch name:

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



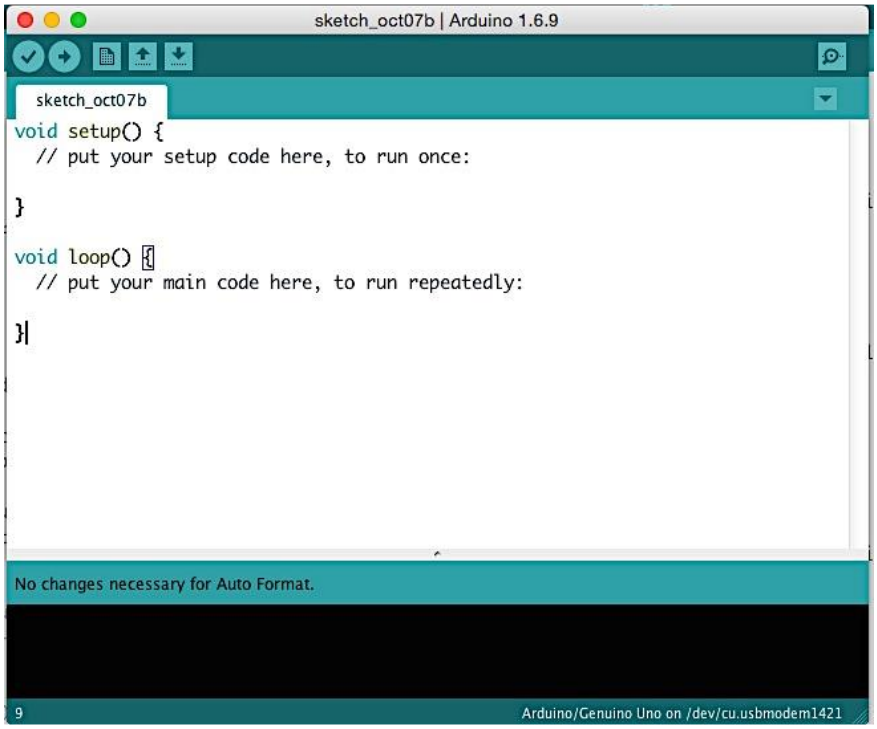
o) Code composes area:

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.