Arduino Step-by-step tutorial

# Setup development environment

## Install Arduino IDE

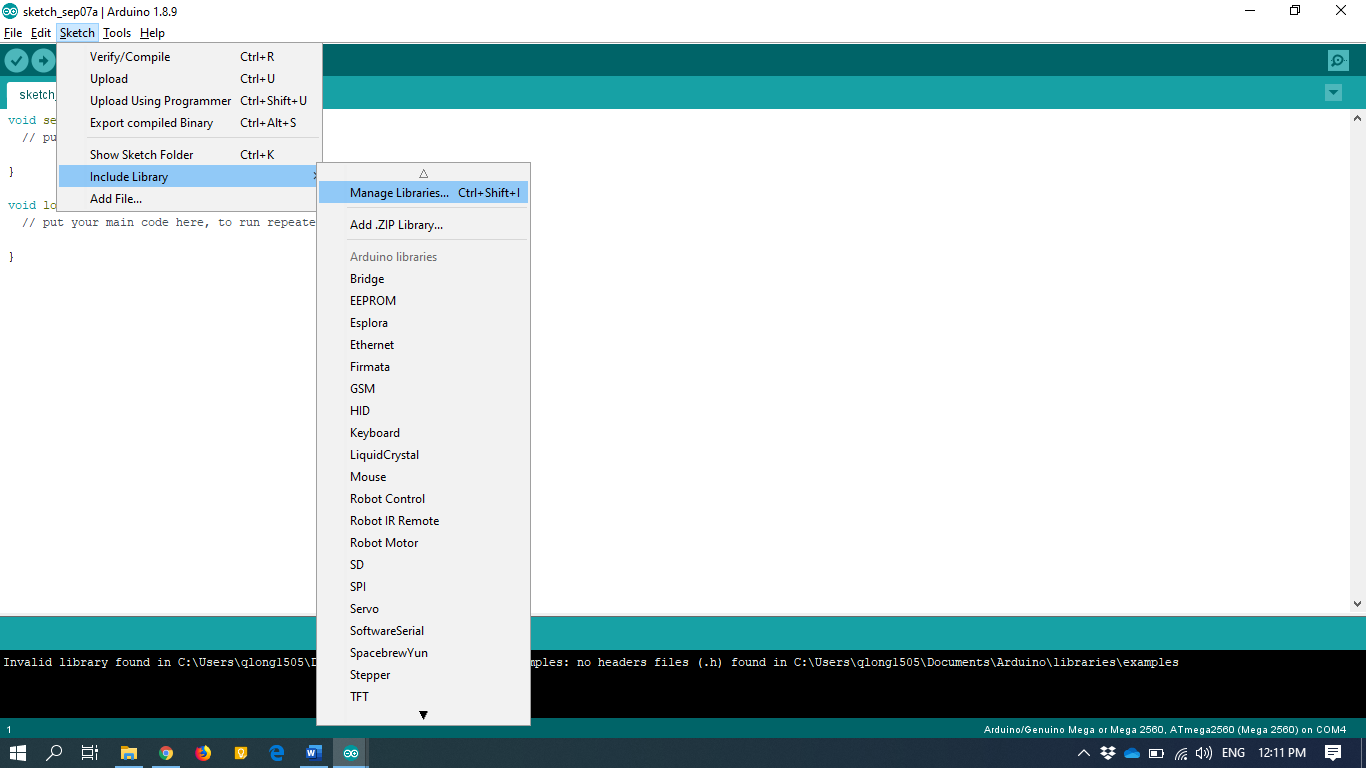
Go to <https://www.arduino.cc/en/main/software> to download Arduino IDE and install it to your computer.

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux.

## Install necessary library

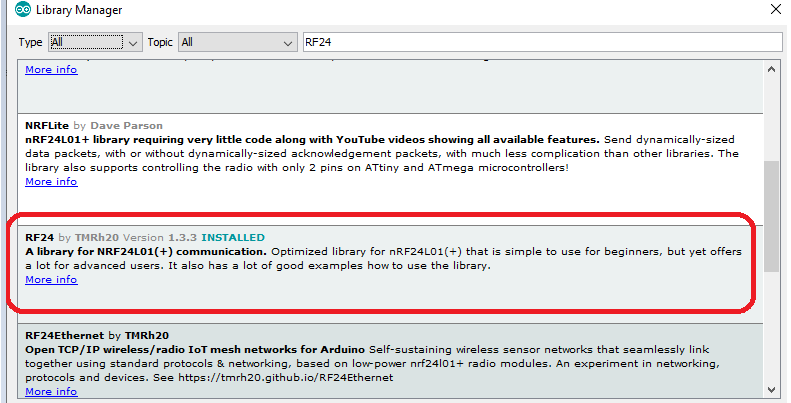
Step 1: Open Arduino IDE

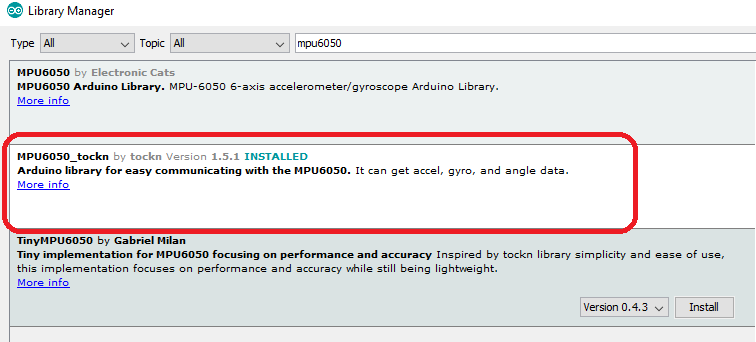
Step 2: Open Arduino Library Manager. The library manager is located in Sketch menu or Tools menu depending on your Arduino IDE version.



Step 3: Search for RF24, and MPU6050 and click install

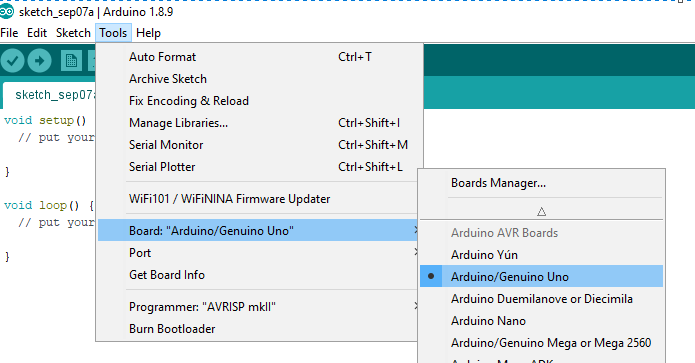
There are many sources of library. In the workshop, we will use “RF24” and “MPU6050\_tockn” library.





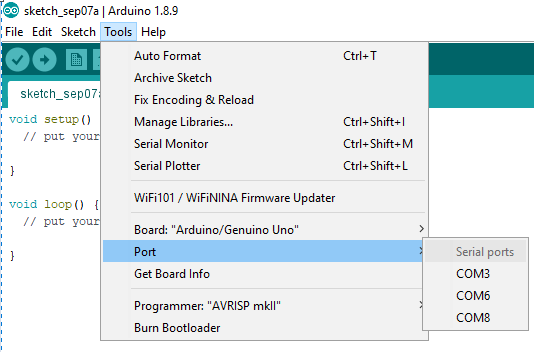
## Hardware board configuration

### Choose Arduino Uno board

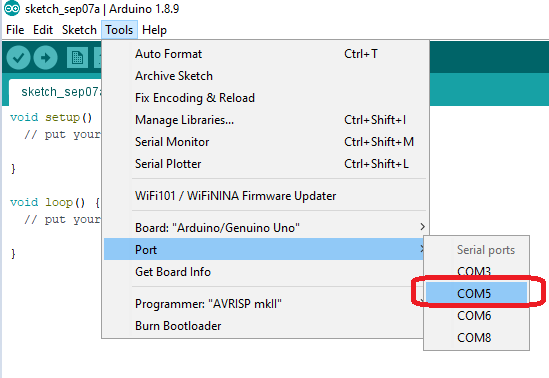


### Select Port of the Arduino hardware

Step 1: DO NOT plug Arduino board to your PC, then go to the port to check current system’s ports



Step 2: Plug the Arduino Board to your PC, then check the port again, a new COM port should show up and select this port

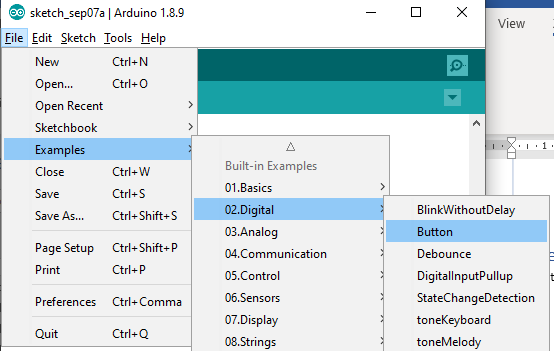


# Test example code

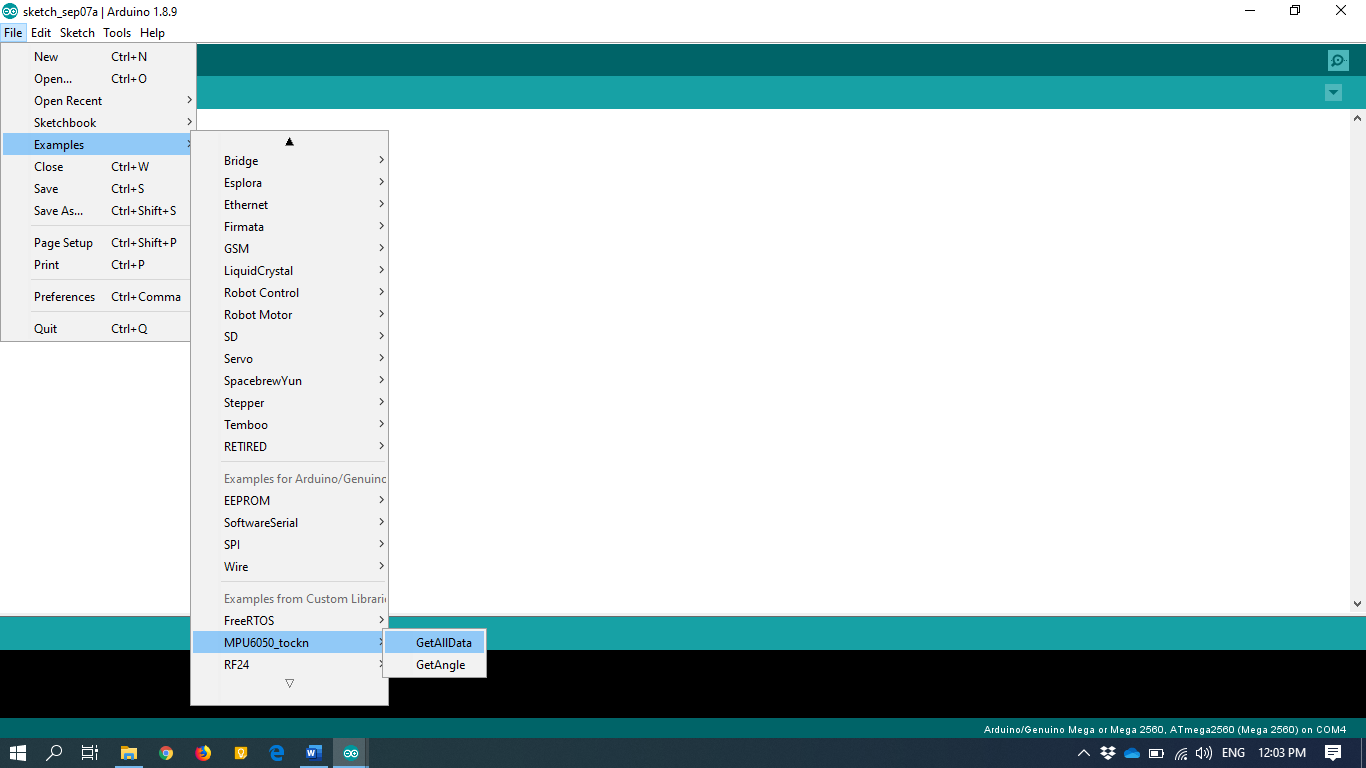
Follow the picture instruction to open the example library and try to run on Arduino.

**Try to understand the code?** No worry, give the friendly voluntary helpers a yell in the workshop to get help!

## Test Button program

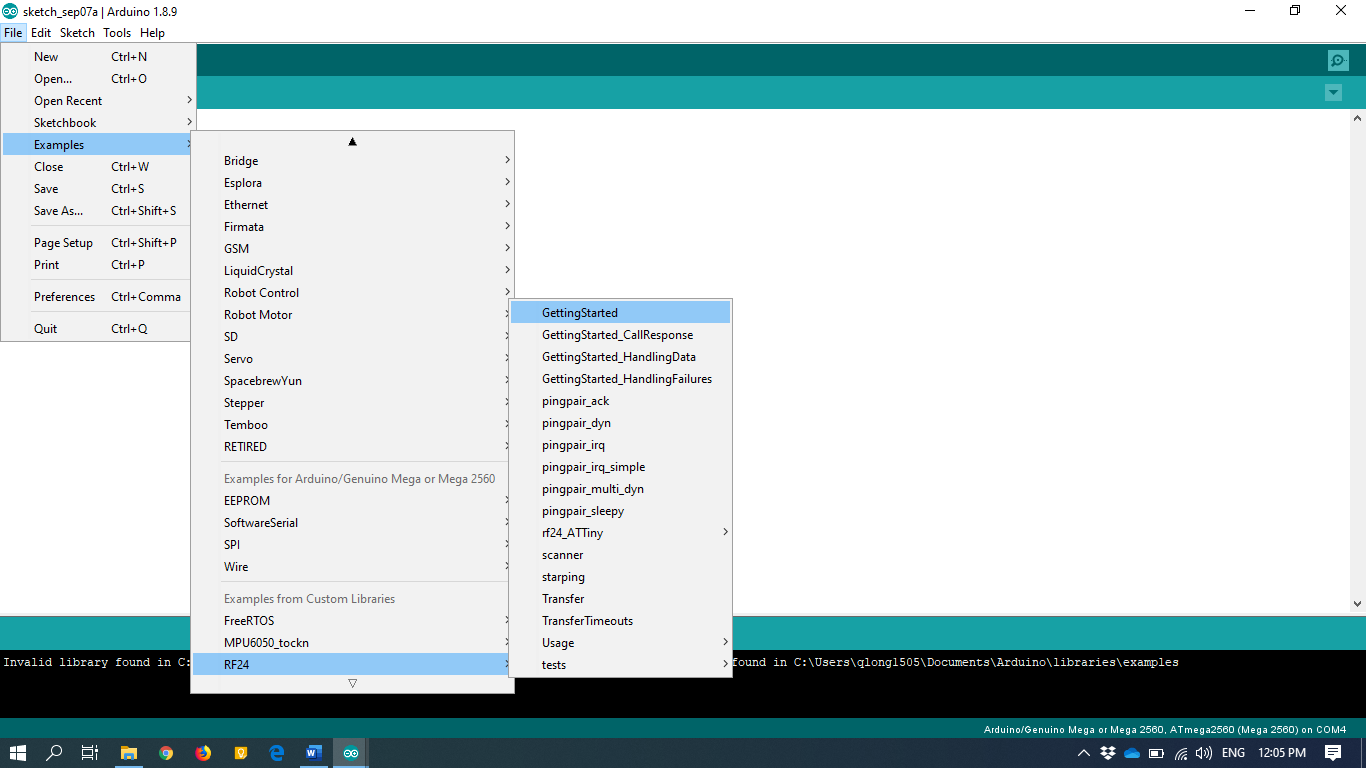


## Gyro MPU6050 sensor



## RF24 transceiver

Now let’s start to run the example code from RF24 library. Please follow the instruction in the below photo



**Need help?** No worry, give the friendly voluntary helpers a yell in the workshop to get help!

**Note 1: We use pin 5 & 10 in the workshop so change radio(7,8) to radio(5,10) at line 16**

/\* Hardware configuration: Set up nRF24L01 radio on SPI bus plus pins 7 & 8 \*/

RF24 radio(5,10);

**Note 2:** We need two boards to test the transmission. One board can be the receiver and the other one can be the transmitter. Find the line contain the code below (line number 19)

byte addresses[][6] = {"1Node","2Node"};

The first address “1Node” is sender address, the “2Node” is receiver address.

The program is designed to run either sender and receiver. So one of the board needs to swap the address. Eg. “2Node” for sender and “1Node” for receiver.

# Time to practice:

**Problem to solve:** Send gyro’s X and Y data from one Arduino board to another Arduino via RF24 module.

