

## Internet

### Milestone 2

Deadline: Thursday 17.10.2019 at 11:59 pm

## 1 Introduction

Using Internet of Things (IOT), we can control any electronic equipment in homes and industries. Moreover, you can read a data from any sensor and analyse it graphically from anywhere in the world.

Assume you have an IoT sensor (ex: temperature, light, RFID...) connected to the analogue input of an ESP8266 Wi-Fi module (you will only need to get the [ESP8266](#) for the project) which will periodically send the temperature readings to the server, using client server module of socket programming. The data received by the server is then stored on a database for analytical usage in the future.

## 2 Requirements

### 2.1 Milestone 2 Requirements

In this milestone you should initiate the communication between the client and the server; the client will be installed on the ESP8266 Wi-Fi module Figure 1. **Each team must have at least two ESP8266 modules** which will send the readings of the sensors to the Java server implemented in previous milestones.

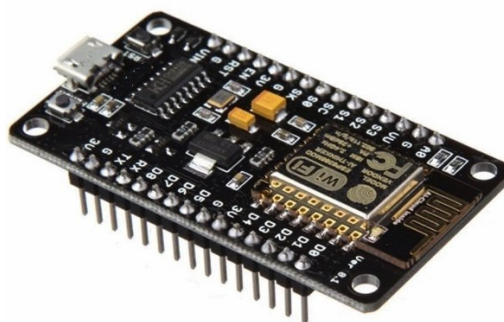


Figure 1 Wi-Fi ESP8266-12-F Serial TTL Module

1. The client should be able to send data (assume a number or a string) to the server.
2. First Install Arduino IDE to your PC with the corresponding libraries (steps mentioned below).
3. Install the client code on the ESP8266 module (steps mentioned below).

4. The ESP8266 and the server should be connected on the **same** network.

**Note that:**

- The server should be able to communicate to multiple clients in parallel (as in milestone 1).
- The clients should periodically send data to the server.

## 2.2 Required Materials:

Required Software:

1. Eclipse for Java Server
2. Arduino IDE for ESP8266

Required Hardware:

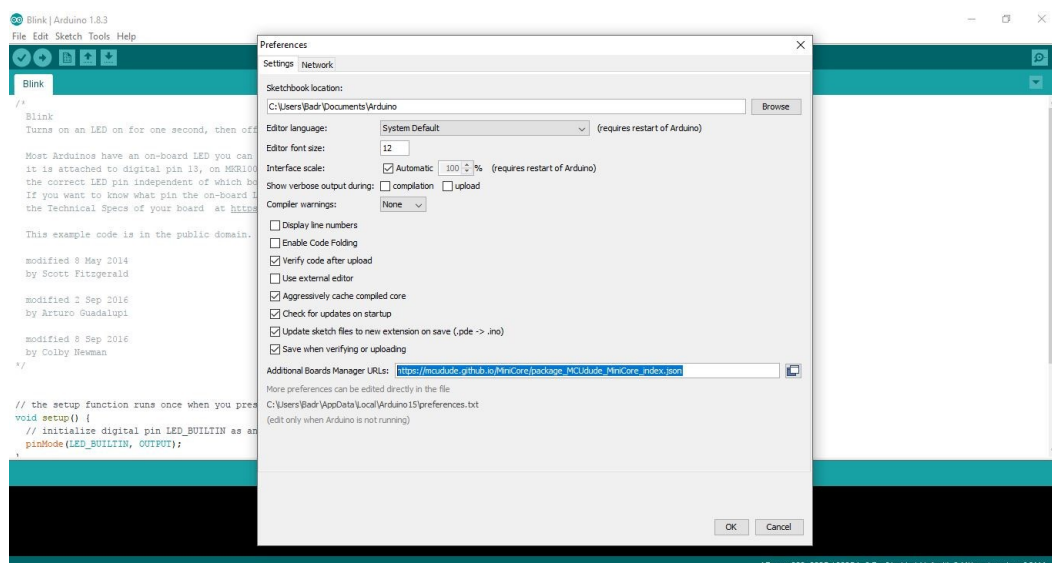
1. Two ESP8266 Wi-Fi modules ([Link](#)).
2. Two (Temperature or Light) Sensors.

**The ESP8266 module is available in the following stores:**

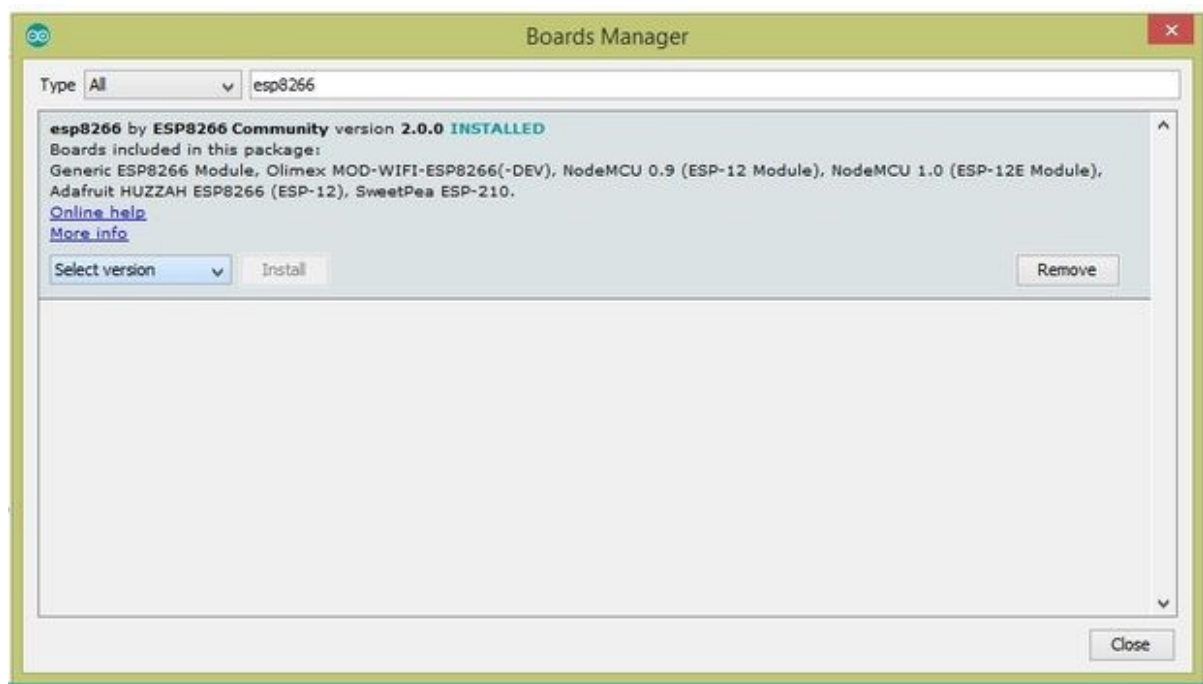
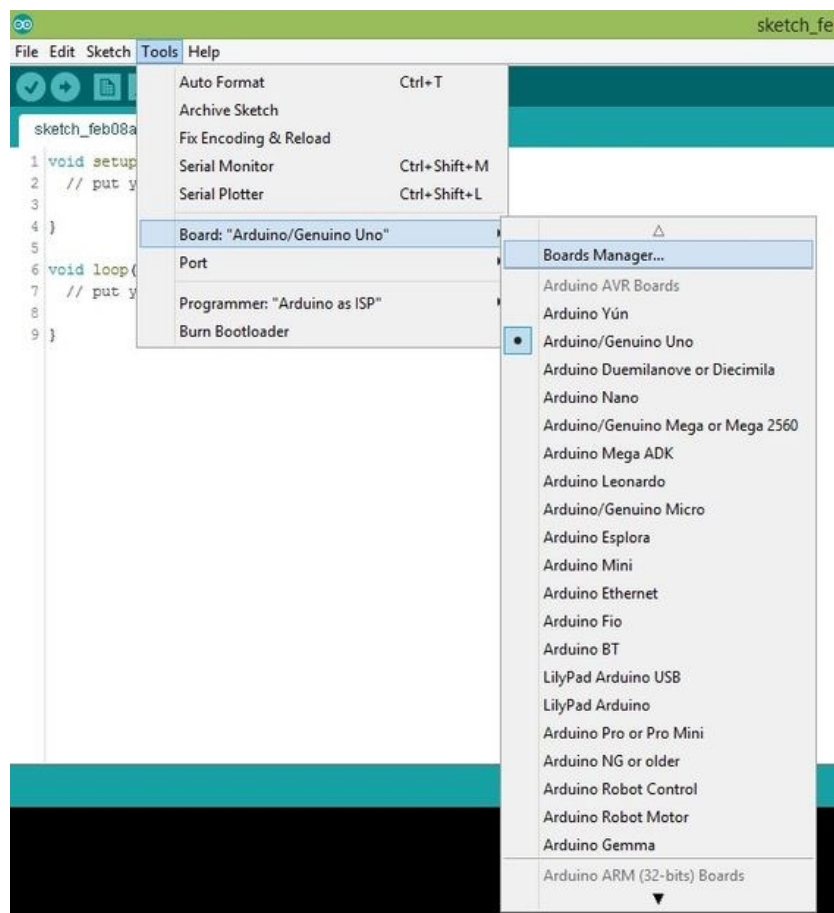
- 1- <https://store.fut-electronics.com/products/nodemcu-esp8266-programming-and-development-kit>
- 2- [http://ram-e-shop.com/oscmx/catalog/product\\_info.php?products\\_id=3415](http://ram-e-shop.com/oscmx/catalog/product_info.php?products_id=3415)

## 2.3 Connect ESP8266 with Arduino IDE (Steps)

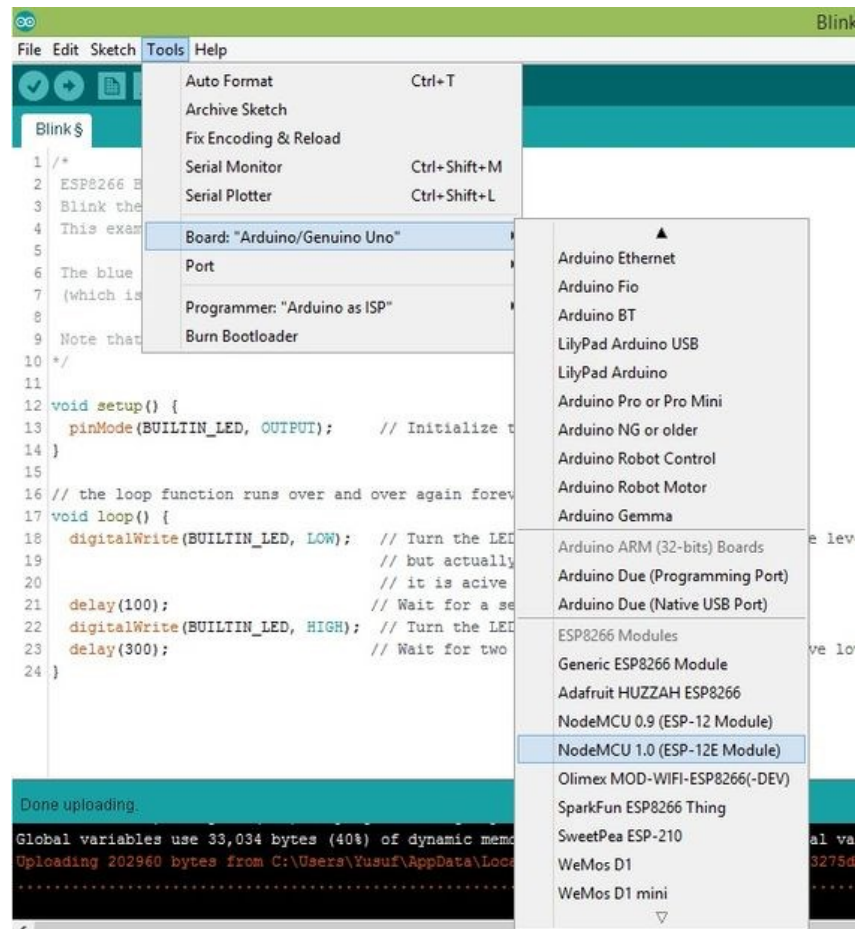
1. Install the current upstream Arduino IDE at the 1.8 level or later. The current version is at the [Arduino website](#).
2. Start Arduino and open Preferences window.
3. Enter [http://arduino.esp8266.com/stable/package\\_esp8266com\\_index.json](http://arduino.esp8266.com/stable/package_esp8266com_index.json) into *Additional Board Manager URLs* field. You can add multiple URLs, separating them with commas.



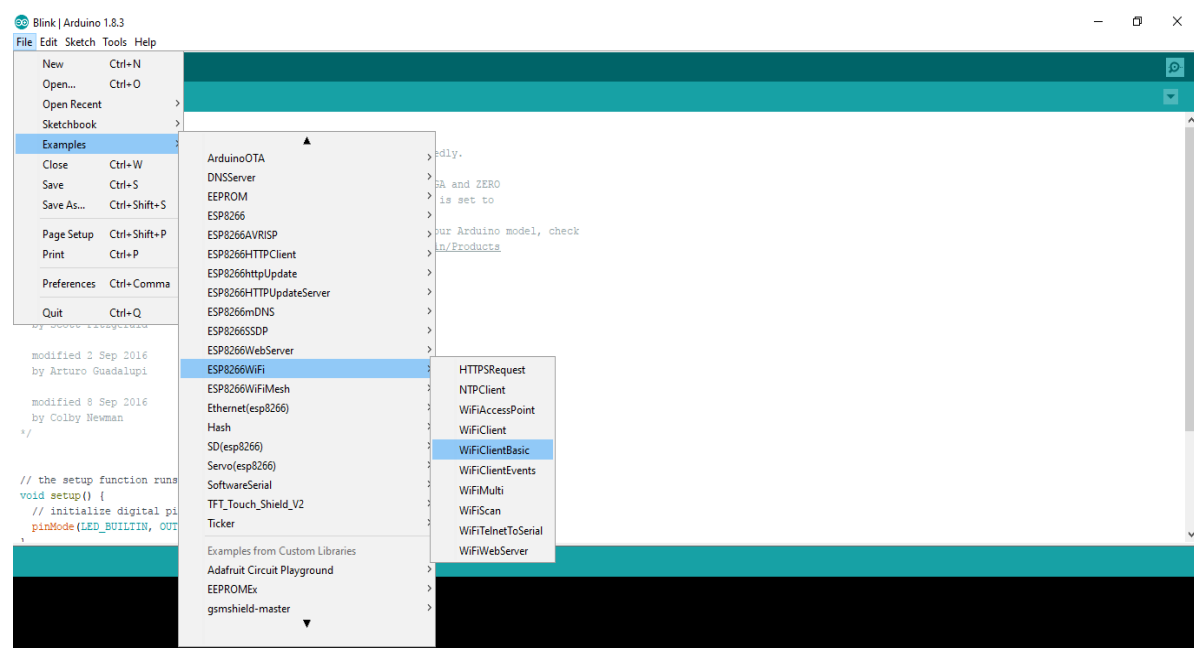
4. Open Boards Manager from Tools > Board menu and install *esp8266* platform (and don't forget to select your ESP8266 board from Tools > Board menu after installation) as shown in the figures.



- Restart your Arduino IDE, then open Boards from Tools Menu and Select NodeMCU 1.0 (ESP-12E Module).



- Test initial code for Client: open Examples from File menu > ESP8266WiFi > WiFiClientBasic



7. Update the code with your access point SSID and password.

```
// We start by connecting to a WiFi network  
WiFiMulti.addAP("Your Wifi Name", "Password");
```

8. Change the IP address and the port number similar to the IP address and port number assigned to the Server in the Java code.

```
void loop() {  
  //Server Port Number  
  const uint16_t port = 6789;  
  //Server IP Address  
  const char * host = "192.168.1.1";
```

More info about ESP8266 ([Link](#))

### 3 Submission

Milestone 2 is a team task. Each team should have **at least 2 members and Maximum 4 members**. Any cheating will be graded **ZERO**.

The Deadline for submitting milestone 2 on Thursday 17/10 at 11:59 pm.

You should submit your milestone 2 using the following google form.

<https://docs.google.com/forms/d/1g1NhF0y7JN78c6IT8xkj948vHzV431SvpbYByRGF99I/edit>