

# IoT for entrepreneurs

## *the code explained (part 1)*

Clément Levallois

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# Table of Contents

The code, explained steps by steps .....	1
The end .....	4



## The code, explained steps by steps

```
// libraries pre-installed with the board
```

```
#include <ESP8266WiFi.h> ①  
#include <SoftwareSerial.h> ②  
#include <Wire.h> ③
```

- ① The library for the Huzzah Feather (the specific board we use)
- ② The library enabling the board to send info to the computer (useful to debug!)
- ③ The library enabling Wifi

```
// libraries we added "manually"
```

```
#include <Adafruit_GFX.h> ①  
#include <Adafruit_FeatherOLED.h> ②  
#include <ArduinoJson.h> ③
```

- ① The library to help the board deal with graphics
- ② The library to help the board deal with the specific screen Feather OLED
- ③ The library that saves us time when dealing with text formatted in JSON

The next lines of code are used to store some useful information:

```
char* ssid    = "name of wifi network here"; ①  
char* password = "password here"; ②
```

- ① means: we create the variable called **ssid**. We give it the value 'name of wifi network here'. This variable is of type **chars\*** (characters)
- ② means: we create the variable called **password**. We give it the value 'password here'. This variable is of type **chars\*** (characters)

Of course, these values are just examples and you should put the name of your own wifi network and password.



Don't forget the semi-colon at the end of the lines!

```
String location = "Saint-Etienne"; ①
```

① means: we create the variable called `location`. We give it the value "Saint-Etienne" (you can choose another place of course). This variable is of type `String` (`String` is the technical term for text).

```
Adafruit_FeatherOLED screen = Adafruit_FeatherOLED(); ①
```

① means: we create the variable called "screen". We give it the value returned by the function `Adafruit_FeatherOLED()`. The variable is of type `Adafruit_FeatherOLED`.

```
WiFiClient client;①
```

① means: we create the variable named "client", of type "WifiClient". It has no value yet.

```
void setup() { ①
```

① This is called a function or method. The `setup` function is executed just once, when the board is powered up.

Don't know what functions are? [Check here](#).

```
// initialize the communication between the board and our computer.  
// useful to display useful info.  
  
Serial.begin(9600);①  
while (!Serial)②  
{③  
  ; ④  
}⑤
```

① means: we execute the method called `begin` on the variable `Serial`.

② means: as long as the variable "Serial" is not equal to "true", execute the lines of codes in the curly braces `{ }` in <3> and <5>. [More info here](#).

③ The instructions in the curly braces are just this `;`, which do nothing. So the board is basically waiting until `Serial` switches to "true".

```
//initialize the screen and hides the battery sign  
  
screen.init();①  
screen.setBatteryVisible(false);②
```

① means: we execute the method called `init` on the variable `screen`.

② means: we execute the method called `setBatteryVisible` on the variable `screen`. We use the parameter `false` for this method.

```
//initialize the wifi connection
```

```
WiFi.begin(ssid, password); ①
```

① means: a variable from the board (not created by us) is called "Wifi". We execute the method `begin` on it, which will start the connection to the wifi. So we give it 2 parameters: the name and password for the wifi, which we defined above.

```
// the program freezes as long as the wifi is not connected
```

```
while (WiFi.status() != WL_CONNECTED ) { ①  
    delay(500);②  
}
```

① This another `while` loop, like the one above. The `status` method of `Wifi` returns a value which is `true` when the wifi is connected, and `false` otherwise. `WL_CONNECTED` is a variable with a value of `true`.

② `delay` is a simple function which freezes the board. For how long? For the duration shown in the parentheses, in milliseconds. So here, `delay(500)` freezes the board for 0.5 seconds before it retries to connect to the wifi.

```
} ①
```

① Do not forget this closing bracket, corresponding to the opening brack from the line above `void setup() {`

```
void loop() { ①
```

① the lines of code inside the loop function will be executed until the last, then start over again and again. This is where the interesting stuff happens! [See here for more](#).

```
screen.clearDisplay();①  
screen.clearMsgArea();②
```

① deletes what is on screen

② deletes the previous message

```
//get the quality of air at location  
callAQI(location);① ②
```

- ① means: execute the method `callAQI`. Where does it come from? You will write the code for this function in a separate file. The role of this function is to connect via wifi to <http://waqi.info/> and return the air quality for a given location.
- ② `location` is a parameter to the function. It is a variable you defined above (scroll up).

```
String aqiNumber = readAQIResponse();①
```

- ① We create the variable `aqiNumber`, of type `String`. The value assigned to this variable is the number returned by the function `readAQIResponse()`.

Where does the `readAQIResponse` come from? It is a function written in another file by you. It picks the text returned by the previous function (`callAQI`), and extracts from it the number representing the air quality.

```
//display the air quality on the screen  
  
screen.println("air quality");①  
screen.println("at " + location + ":");②  
screen.println(aqiNumber);③  
screen.display();④
```

- ① will write "air quality" on the 1st line of the screen
- ② will write "at Saint-Etienne" on the 2nd line of the screen (if the value of your location variable is "Saint-Etienne")
- ③ will write the air pollution index retrieved from above
- ④ will show the message on screen (if you forget this line, the message is not visible).

```
// wait 5 seconds  
delay(5000);  
} ①
```

- ① Don't forget this closing curly brace. It closes the function opened above with `void loop ()`

## The end

Find references for this lesson, and other lessons, [here](#).



This course is made by Clement Levallois.

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