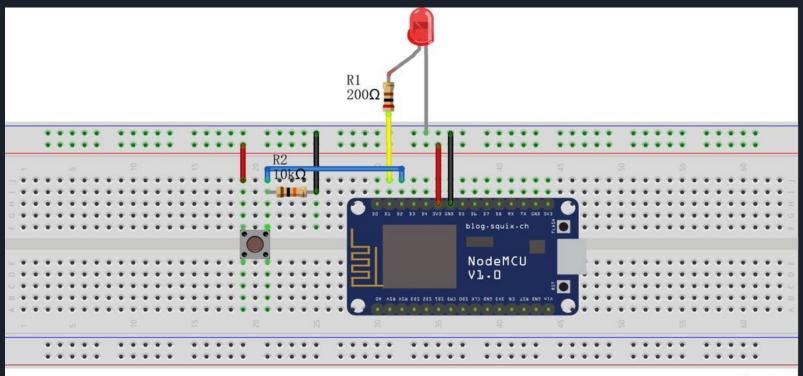
# IOT Lab Assignment 2

First esp8266 program (button controlled led)

### Install Arduino IDE and setup for esp8266

- 1. Download the Arduino IDE, the latest version. (https://www.arduino.cc/en/Main/Software)
- 2. Install the IDE
- 3. Set up your Arduino IDE as: Go to File->Preferences and copy the URL below to get the ESP board manager extensions:
  - http://arduino.esp8266.com/stable/package\_esp8266com\_index.json Placing the http://before the URL lets the Arduino IDE use it...otherwise it gives you a protocol error.
- 4. Go to Tools > Board > Board Manager > Type "esp8266" and download the Community esp8266 and install.
- 5. Set up your chip as:
  - Tools -> Board -> NodeMCU 1.0 (ESP-12E Module)
  - Tools -> Flash Size -> 4M (3M SPIFFS)
  - Tools -> CPU Frequency -> 80 Mhz
  - Tools -> Upload Speed -> 921600
  - Tools-->Port--> (whatever it is)

## Button and LED wiring



#### Basic Arduino Programing

#### Setup:

- Function runs at boot once then falls into loop function
- Good place to setup gpio pins, wifi settings, initialize variables

#### Loop:

- Function runs repeatedly
- Do the main work of your program here

General arduino programming guide <u>here</u>

```
sketch_jan28a | Arduino 1.8.6
File Edit Sketch Tools Help
   sketch jan28a
void setup() {
   // put your setup code here, to run once:
}
void loop() {
   // put your main code here, to run repeatedly:
F9), v2 Lower Memory, Disabled, None, Only Sketch, 115200 on /dev/ttyUSB1
```

### Serial printing

Serial.begin(9600);

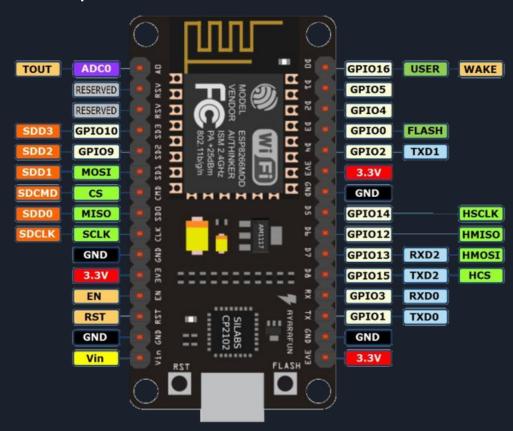
• Setup serial port

Serial.println("hey");

Print statement just like C

```
test | Arduino 1.8.6
File Edit Sketch Tools Help
void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600); // opens serial port
void loop() {
 // put your main code here, to run repeatedly:
Serial.println("hey"); // print something
Sketch uses 249528 bytes (23%) of program storage space. Maximum is 1044464 bytes.
Global variables use 27636 bytes (33%) of dynamic memory, leaving 54284 bytes for local variables. Maxi
                                                /dev/ttyUSB0
                                                                                                        Send
✓ Autoscroll  Show timestamp
                                                                                              ▼ Clear output
                                                             Newline
                                                                               9600 baud
```

### Esp8266 pinout



### GPIO (General Purpose Input Output)

pinMode(LED, OUTPUT);

Setup pin as output

digitalWrite(LED, HIGH);

- Set pin to high (on)
- Can also be set to LOW (off)

```
test | Arduino 1.8.6
File Edit Sketch Tools Help
   test §
#define LED 4 //define led pin var
void setup() {
  // put your setup code here, to run once:
  pinMode(LED, OUTPUT); // setup pin for output
void loop() {
  // put your main code here, to run repeatedly:
  delay(1000); // delay one second
  digitalWrite(LED, HIGH); //turn led on
Done uploading
MISPIFFS), v2 Lower Memory, Disabled, None, Only Sketch, 115200 on /dev/ttyUSB0
```

### GPIO (General Purpose Input Output)

#### pinMode(BUTTON, INPUT);

Set pin as input

#### digitalRead(BUTTON);

- Read the value of the pin
- Will equal HIGH or LOW (0/1)

```
test | Arduino 1.8.6
                                                             ×
File Edit Sketch Tools Help
  test
#define BUTTON 5 //define led pin var
void setup() {
  // put your setup code here, to run once:
  Serial begin (9600):
  pinMode(BUTTON, INPUT); // setup pin for input
void loop() {
  // put your main code here, to run repeatedly:
 Serial.println(digitalRead(BUTTON));
```

#### Done uploading.

Global variables use 28060 bytes (34%) of dynamic memory, l Uploading 255552 bytes from /tmp/arduino\_build\_888763/test

3M SPIFFS), v2 Lower Memory, Disabled, None, Only Sketch, 115200 on /dev/ttyUSB0

#### Assignment

- Wire up the button and led
- Create a program that will toggle the state of the led when the button is clicked (each click changes the current state of the led)

 Take a video of yours and send it to me before next class <u>dpivonka@redhat.com</u>