



IoT Workshop

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**DE HOGESCHOOL
MET HET NETWERK**

Hogeschool PXL – Elfde-Liniestraat 24 – B-3500 Hasselt
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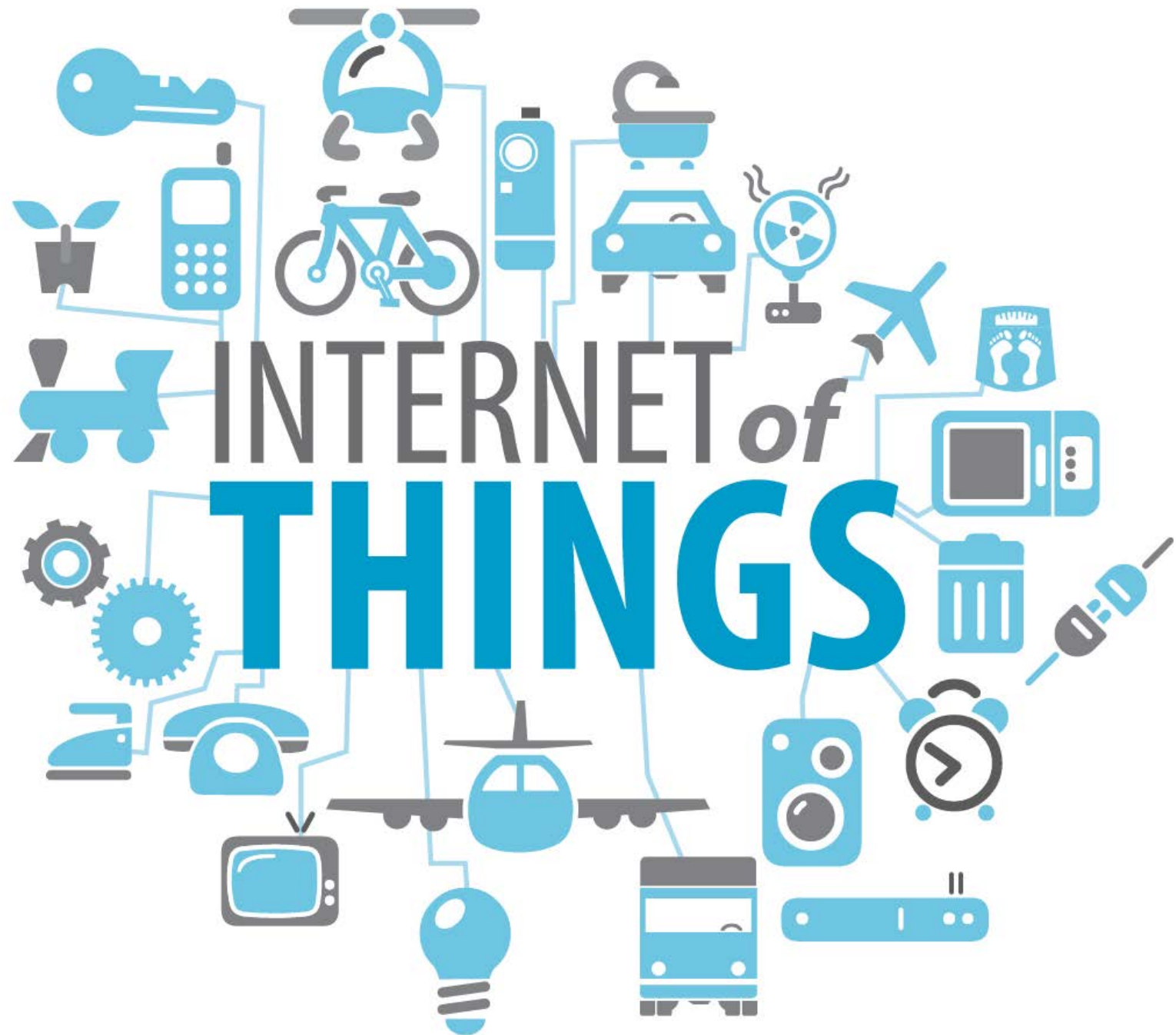
Vandaag

- IoT
- PCB
- Arduino IDE
- Web API
- Appinventor App
- Fun



Concept

IOT

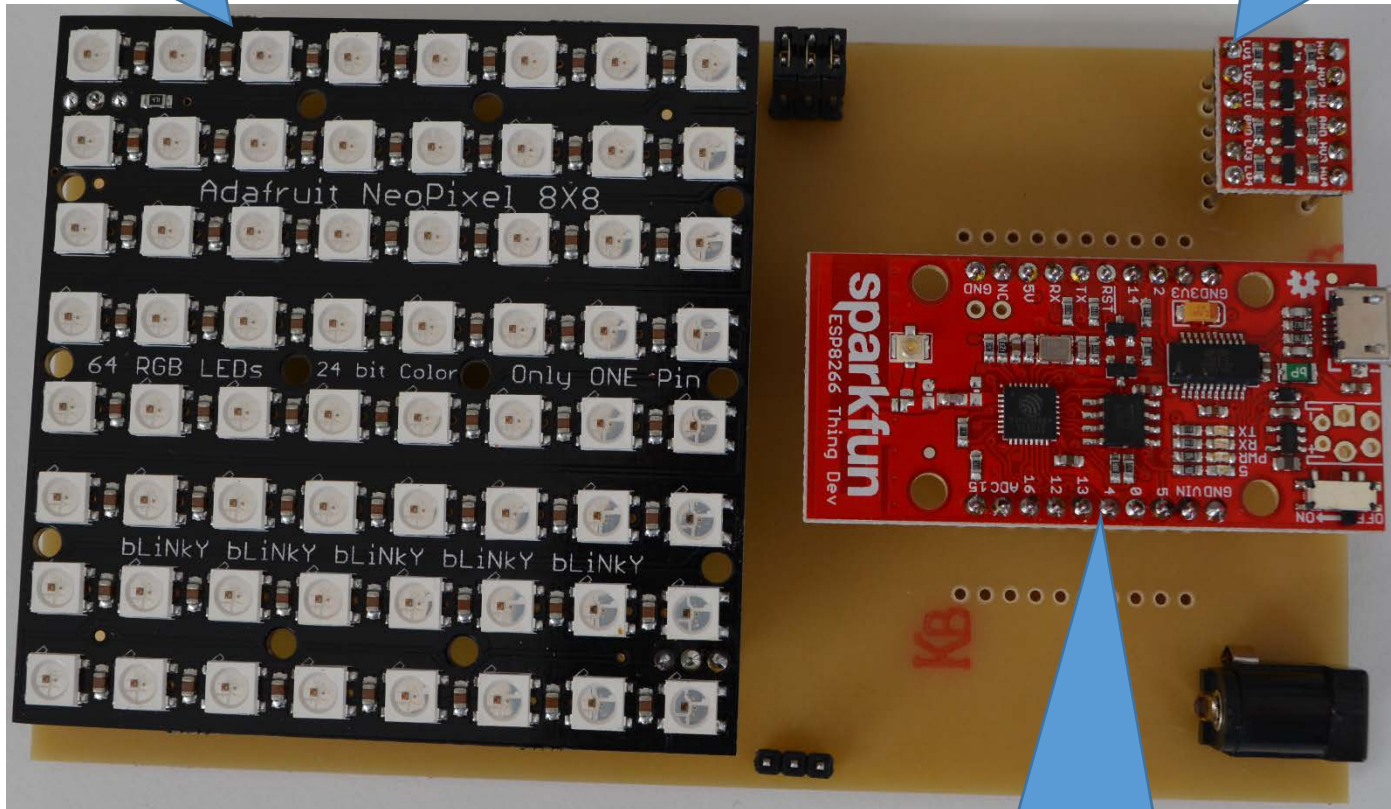


Hardware

PCB

8x8 RGB Matrix

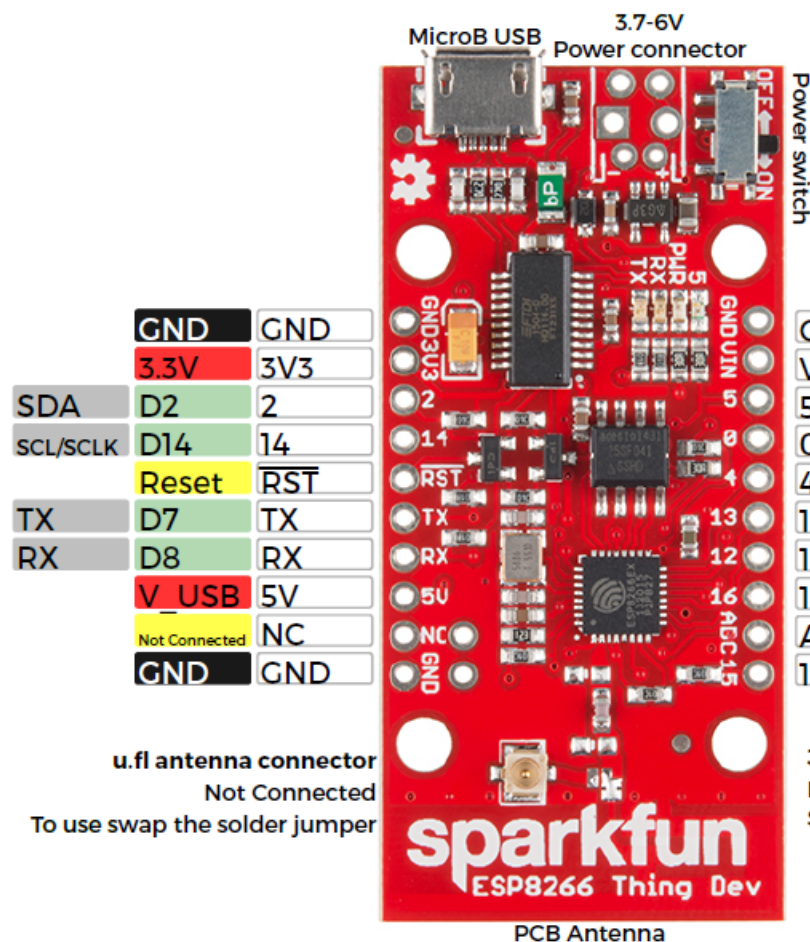
Logic Level Converter
Bi-Directional



ESP8266 Thing Dev Board

ESP8266 Thing Dev Board (WRL-13711)

Arduino add-on available
80MHz



	GND	GND
	3.3V	3V3
SDA	D2	2
SCL/SCLK	D14	14
	Reset	RST
TX	D7	TX
RX	D8	RX
	V_USB	5V
	Not Connected	NC
	GND	GND

u.fl antenna connector
Not Connected
To use swap the solder jumper

Power switch

GPIO0
On bootup will run program if high and bootloader if low
Tied to DTR to run bootloader when reset

GND	GND	
Vin	Vin	
5	D5	LED
0	D0	Used in reset
4	D4	
13	D13	MOSI
12	D12	MISO
16	D16	XPDP
ADC	A0	10-bit 1V
15	D15	

Jumpers on back

PWR-LED - cut to disconnect power LED
SLEEP-EN - Connect RST to XPD to enable sleep (disables programming)

Name	Arduino
Power	ADC
GND	Serial
Control	Misc

Power (ESP8266 Thing)

Vin: 3.7V-6V
VUSB: 5V
VCC: 3.3V @ 500mA
Max 12mA per I/O pin

Typical Power (ESP8266 module)

Transmit 135-215mA
Receive 60-62mA
Standby 0.9mA
Deep sleep 10uA

LEDs

Power: Red
User (pin 5): Blue
RX: Yellow
TX: Green

Wi-Fi

802.11 b/g/n
Wi-Fi Direct (P2P) soft AP

 **sparkfun.com**



Embedded Software

ARDUINO IDE



HelloWorldBlink



```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin 5 as an output.
  pinMode(5, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(5, HIGH); // turn the LED on (HIGH is the voltage level)
  delay(1000);           // wait for a second
  digitalWrite(5, LOW);  // turn the LED off by making the voltage LOW
  delay(1000);           // wait for a second
}
```

IoTWorkshop.ino

```
#include <ESP8266WiFi.h>
#include <WiFiClient.h>
#include <ESP8266WebServer.h>
#include <Adafruit_GFX.h>
#include <Adafruit_NeoMatrix.h>
#include <Adafruit_NeoPixel.h>

/* Set these to your desired credentials. */
const char *ssid = "IoTWorkshop";
const char *password = "pxleaict";
String decodedMsg= "Welcome...";
ESP8266WebServer server(80);
```



Software 2 Hardware

WEB API

Try it in your browser!

- <http://192.168.4.1/msg?msg=Hello World>
- <http://192.168.4.1/pix?pix=00>
- <http://192.168.4.1/rgb?rgb=255/255/255>
- <http://192.168.4.1/clear>



Applicatie

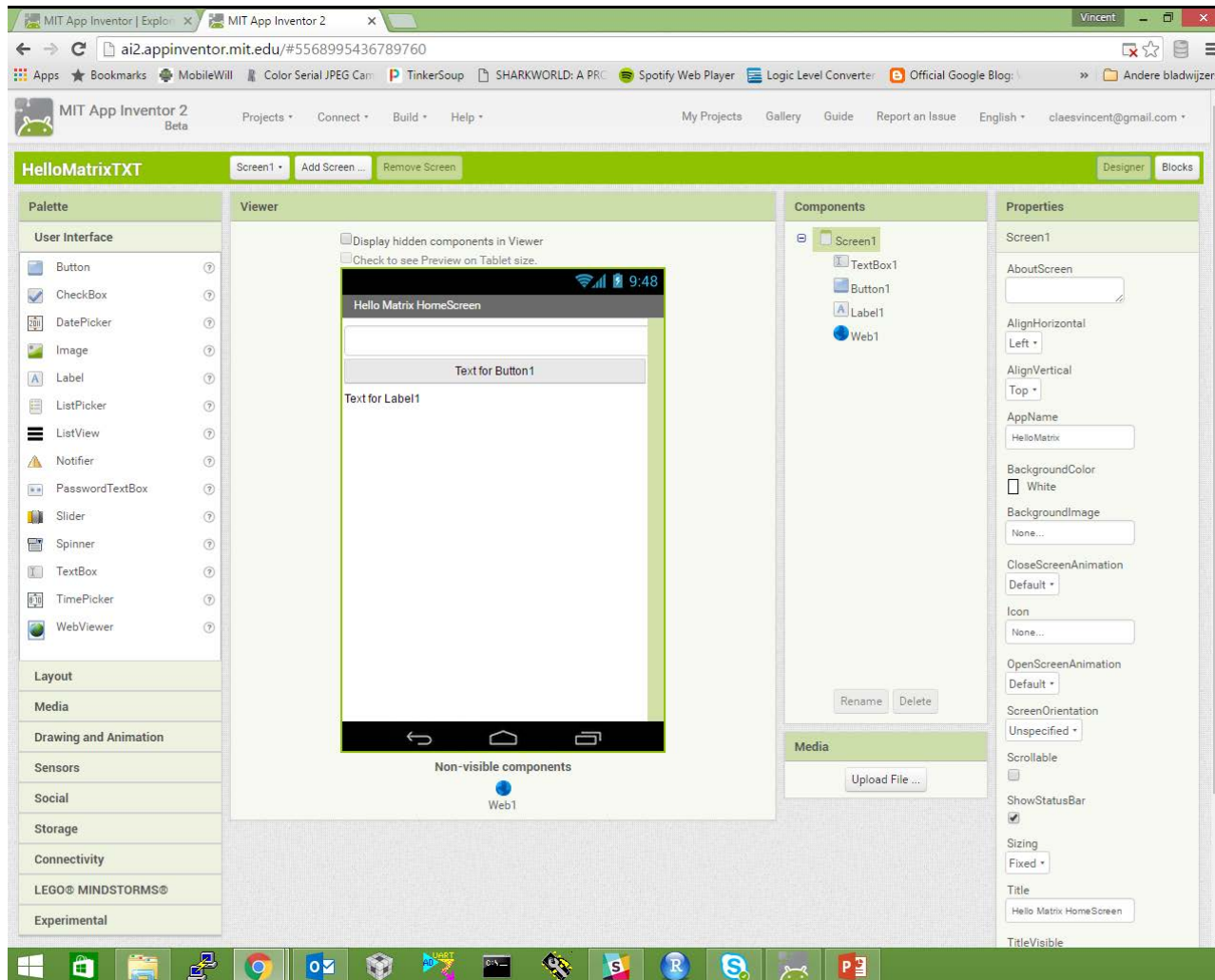
ANDROID APP

Appinventor

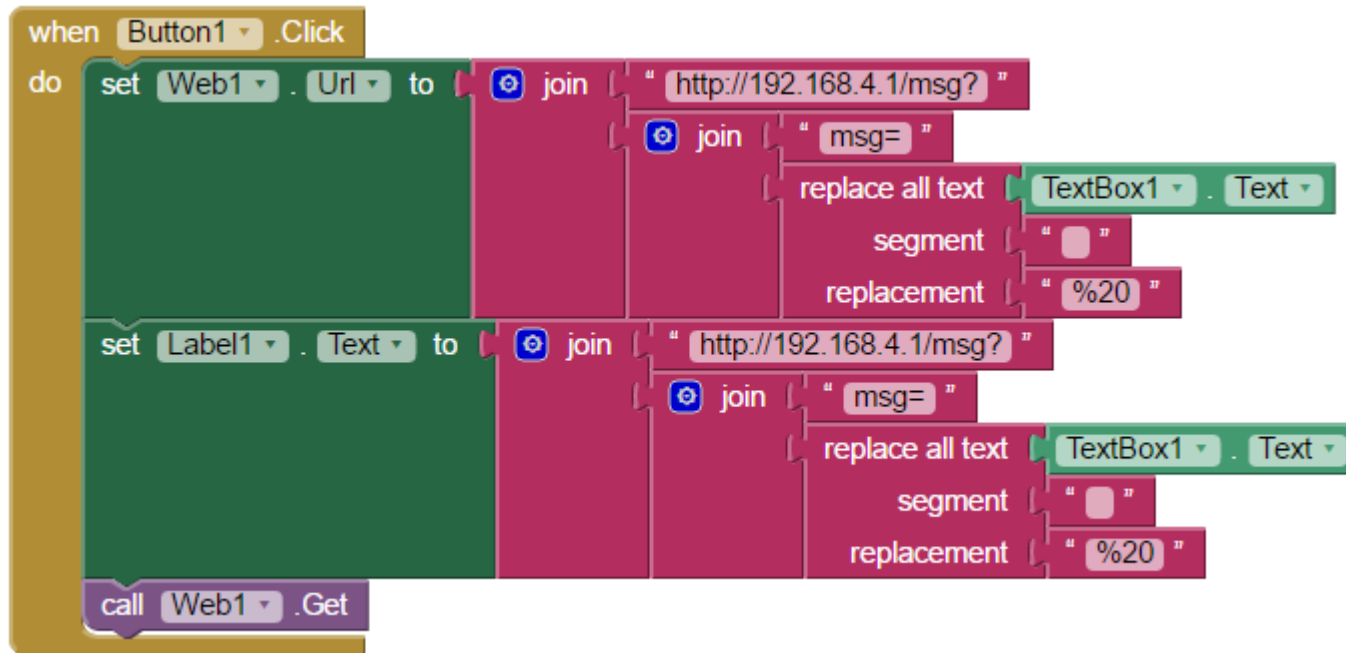
- Android
- <http://appinventor.mit.edu/>
- Gmail Account
- AiStarter op desktop [USB DEBUG]



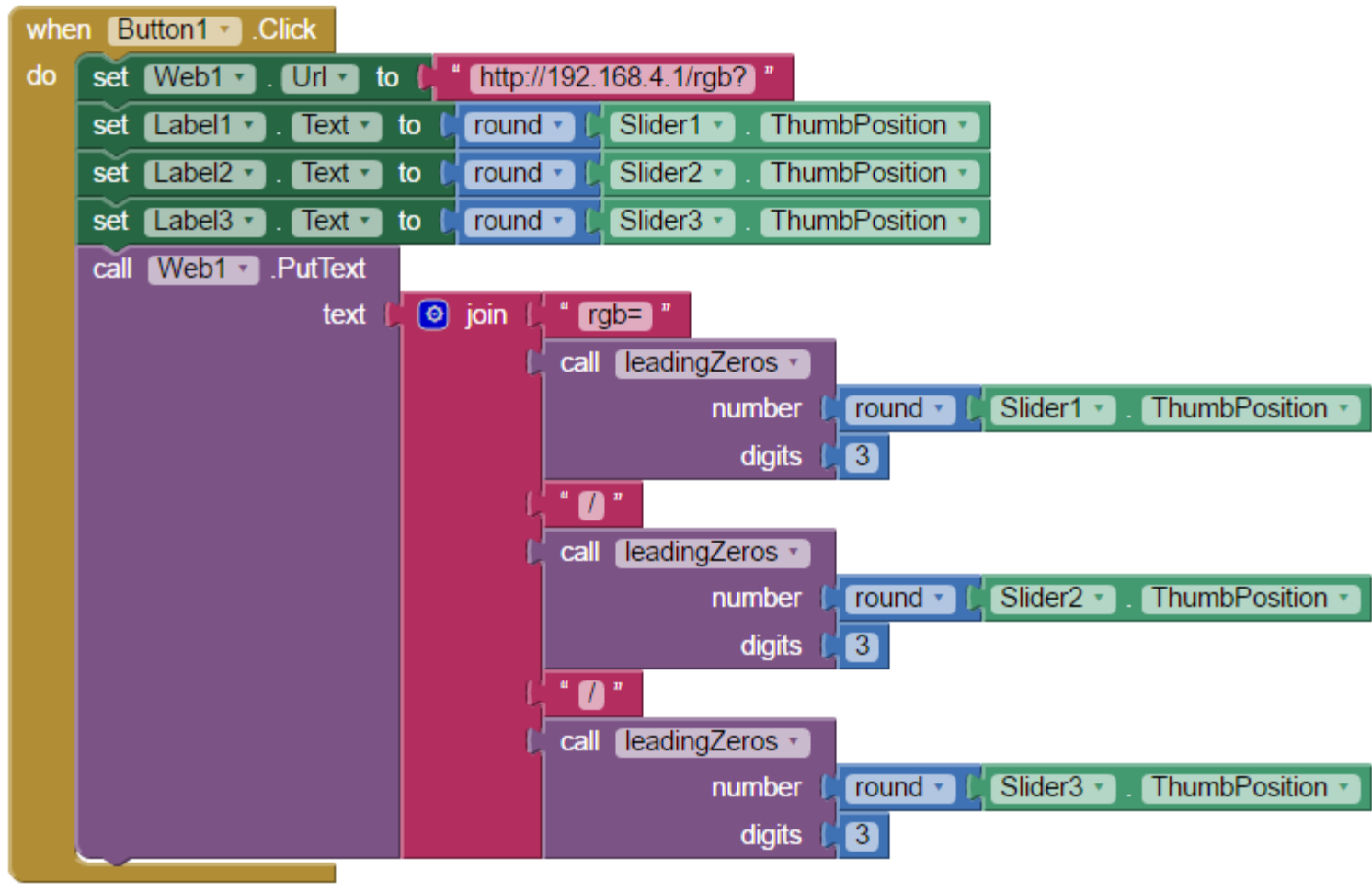
Appinventor Send TXT



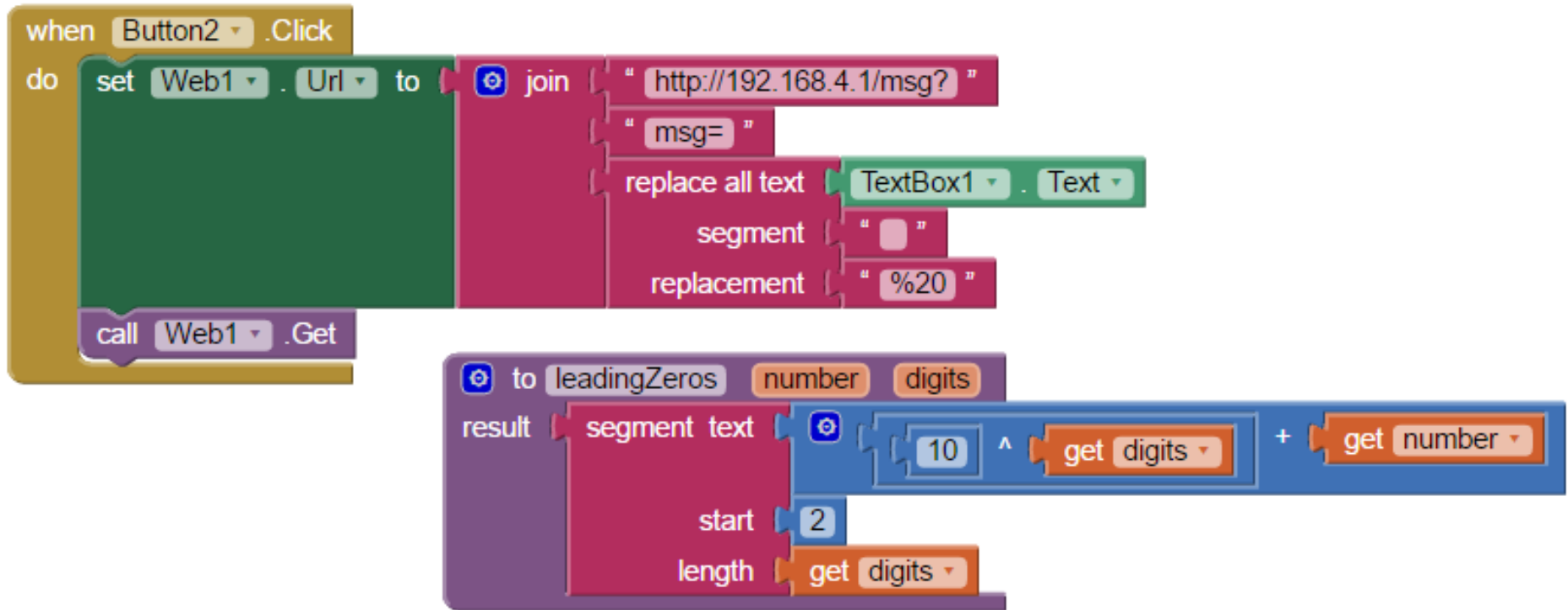
Appinventor Send TXT



Appinventor Colour Setting



Appinventor Colour Setting



Playtime

FUN

Opdracht

