



Unit 7: The TI-RGB Array

Application: Smart Lights

In this application, you will control the number of LEDs lit on the TI-RGB Array using the TI-Innovator Hub's brightness sensor.

Objectives:

- Use the brightness sensor to control the TI-RGB Array
- Adjust the brightness range to suit the TI-RGB Array
- Make sure that all 16 LEDs are impacted by the brightness

Smart Lights

As the room darkens, the lights in the room get brighter. Imagine a 'smart home' with no light switches! Write a program that monitors the brightness and turns on more or less LEDs, as necessary.

1. As usual, begin this Python Hub Project using the `rgb_array()` constructor and the `while` loop to terminate the program with `esc`.

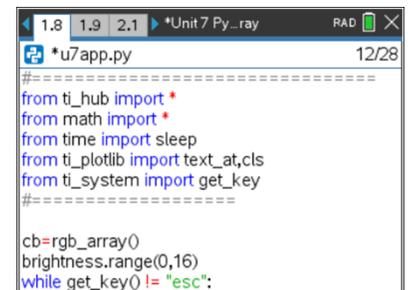
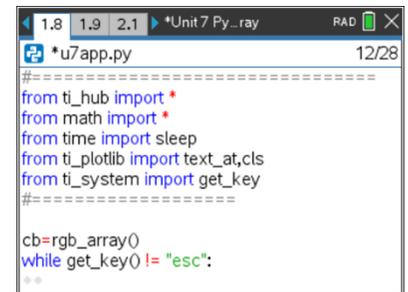
```
cb = rgb_array()
while get_key() != "esc":
```

2. Before the `while` loop, set the `brightness.range()` to match the number of LEDs on the TI-RGB Array board that could be lit: 0 to 16.

Press **menu > TI Hub > Hub Built-in Devices > Brightness Input > range(min,max)** for the statement:

```
brightness.range(0,16)
```

Use **0,16** because this is the range of the number of LEDs to light up on the board. The maximum value the sensor will produce is 16. Is the minimum 0?





10 Minutes of Code - Python

TI-NSPIRE™ CX II WITH THE TI-INNOVATOR™ HUB AND TI-RGB ARRAY™

7. We want *all* the LEDs to be affected by the brightness so we will use a **for** loop to control the state of every LED every time. The **lites** variable is a deciding factor when turning a LED on or off:

for i in range(1,17):

(Remember that the value 17 is not processed by the loop so i takes on the values from 1 to 16 representing the 16 LEDs.)

8. Complete the program by adding an **if...else...** statement to tell the TI-Innovator Hub which LEDs are on and which ones are off.

Hint: If **lites** is 1, then you want to turn on LED 0. When **lites** is 16, you want to turn on all LEDs (#0 to #15). Use the color (255,255,255) to get a bright white light.

Remember to turn **all** the LEDs **off** at the end of the program.

UNIT 7: APPLICATION

STUDENT ACTIVITY

```
1.8 1.9 2.1 *Unit7 Py...ray RAD 23/29
u7app.py
bright=brightness.measurement()
bright=int(bright)
text_at(7,str(bright),"left")
lites= ??
if lites==0:
    cb.all_off()
else:
    for i in range(1,17):
```



(demoAPP.gif)