Random LED's

Time required: 30 minutes

Please read all the directions carefully before beginning the assignment.

1. Comment your code as shown in the tutorials and other code examples.
2. Follow all directions carefully and accurately.
3. Think of the directions as minimum requirements.

Understanding

Demonstrate understanding of:

random numbers, LED's, constants, variables

Knowledge Points

In mBlock we had variables. Variables in Arduino C are the same idea. A variable stores a value in a memory location, and can be changed.

An int variable type is a whole number.

```
int a = 9;
```

A constant is declared once and never changes.

```
// Constant to store upper range of random LED colors
const int UPPER_RANDOM = 21;
```

Requirements

The onboard LED lights change randomly every second.

Tutorial Assignment

1. Start the Arduino IDE. Save the sketch as **RandomLED**.
2. Create and test the program as shown.

```
/**
   @file    RandomLED.ino
   @author  William A Loring
   @version V1.0.0
   @date revised 09/23/20  created: 12/09/17
   @Description: Random LED colors
*/
// ****** DON'T CHANGE THIS CODE ******** //
#include <MeMCore.h>          // Include mBot library
MeRGBLed led(0, 30);          // Setup the onboard LED object
// ****** DON'T CHANGE THIS CODE ******** //

const int UPPER_RANDOM = 20;  // Constant to store upper range of random LED colors
int red, green, blue;         // Variables to store random numbers for different colors

// Initialization code, only runs once
// ****** DON'T CHANGE THIS CODE ******** //
void setup() {
  led.setpin(13);             // Set the pin to access the onboard LED's
  randomSeed(analogRead(A0)); // Seed random number from disconnected analog port
}
// ****** DON'T CHANGE THIS CODE ******** //

void loop() { // Loop forever
  red = random(0, UPPER_RANDOM);    // Generate random number inclusive between 0 & 20
  green = random(0, UPPER_RANDOM);  // Generate random number inclusive between 0 & 20
  blue = random(0, UPPER_RANDOM);   // Generate random number inclusive between 0 & 20
  led.setColor(red, green, blue);   // Set both LED's to random colors
  led.show();                       // Use .show() to make new color take effect.
  delay(1000);                      // Delay in milliseconds
}
```

Assignment

Start with your tutorial project and add the following.

1. Choose a random value for one or two colors, set the others to a static value.
2. Change the range of random numbers.

Assignment Submission

- **All students** → Attach finished programs to the assignment in Blackboard.
- **In class assignment submission** → Demonstrate in person.

- **Online submission** → A link to a YouTube video recording showing the assignment placed in the submission area in BlackBoard.