Functions with Parameters (Sounds and Lights)

Time required: 60 minutes

Please read all the directions carefully before beginning the assignment.

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

Requirements

This program has two functions that behave differently based on the data that is passed in.

Understanding

Demonstrate understanding of:

LED's, buzzer, functions, parameters

Knowledge Points

Functions allow for reusable and modular code. The information or data passed into the function each time it is called can be different.

Please go to the following web site to learn more about functions.

https://startingelectronics.org/software/arduino/learn-to-program-course/15-functions/

```
forward();

forward(24);
forward(48);

// Call a function with 2 arguments
my_function(440, 1000);
my_function(4, 60);

// A function with two parameters
void my_function(int num1, int num2){
    delay(num2);
    buzzer(num1, num2);
```

```
}
```

Tutorial Assignment

1. Start the Arduino IDE. Save the sketch as **FunctionsWParameters**.
2. Complete and test the tutorial program as shown.

```
/**
   @file    FunctionsWParameters.ino
   @author  William A Loring
   @version V1.0.0
   @date revised 06/07/2017  created: 12/16/16
   @Description: mBot onboard LED's with methods
*/
#include <MeMCore.h>  // Include mBot library
MeRGBLed led(0, 30);  // Setup the onboard LED port object
MeBuzzer buzzer;      // Setup buzzer object

// Initialization code, only runs once
void setup() {
  led.setpin(13); // Set the pin to access the onboard LED's
}

void loop() { // Loop forever
  simpleBuzzer(500);  // Function that passes in the pitch for the buzzer.
  delay(2000);
  simpleBuzzer(700);  // Function that passes in the pitch for the buzzer.
  delay(2000);
  blinkLed(3, 500);   // Call function with 2 parameters
  delay(2000);
  blinkLed(2, 250);   // Call function with 2 parameters
  delay(2000);
}

// Function that passes in the pitch for the buzzer.
void simpleBuzzer(int pitch) {
  buzzer.tone(pitch, 500);
}

// Function with 2 parameters to blink Led's and make sounds
void blinkLed(int numFlashes, int delayTime) {
  for (int i = 0; i < numFlashes; i++) { // Loop 5 times, 0-4
    led.setColorAt(0, 60, 0, 0); // Set LED0 (RightSide) to Red
    led.setColorAt(1, 0, 0, 60); // Set LED1 (LeftSide) to Blue
    led.show();                  // Show the specified colors
    buzzer.tone(600, delayTime); // Buzzer sounds 600Hz for delayTime

    led.setColorAt(0, 0, 0, 60); // Set LED0 (RightSide) to Blue
    led.setColorAt(1, 60, 0, 0); // Set LED1 (LeftSide) to Red
    led.show();                  // Show the specified colors
    buzzer.tone(700, delayTime); // Buzzer sounds 700Hz for delayTime
    led.setColor(0, 0, 0);
  }
}
```

Assignment

Start with your tutorial project and add the following.

- Add another simple function with a parameter or parameters that does something with LED's or sound.
- Call the new function.

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.