piRover Builds with K2

P03 – Remote Drive – LED Extension Rev 1.0

Goal:

The goal of Project 03, the final project, is to complete the course by implementing your own version of this smartphone controller.

Part 3 of the project adds the RGB LED capability. You create a piRover_led module and integrate this module and functionality into your P03 Remote Drive project. The module includes toggle functions enabling you to turn each LED both on and off using the Bluetooth input. This feature enables you to turn combination of the LEDs on to produce colors including yellow, cyan, magenta, and white.

Part 3 the final assessment for the course. Do your best and do you own work. Do not assist others.

Prerequisites:

This is an extension to P03 Remote Drive. Drive, buzzer, and servo functionality should be complete.

- P03 Remote Drive

Performance Outcomes:

1. Create a module to support LED operation
2. Interface with Bluetooth to enable remote LED actions including toggle.

Resources:

1. See prerequisite lessons

Materials:

1. piRover
2. remote_drive.py (See P03 document)
3. piRover_buzzer.py (See P03 document)
4. piRover_servo.py (See P03 servo document)
5. piRover_Bluetooth.py (See P03 document)
6. piRover_drive.py (See P03 document)

Part 1 – Set Up

1. Prepare your workspace for this project extension.
    a. Connect to your piRover using VNC. Access your piRover folder and launch VS Code.
    b. Create a new **piRover_led.py** file in the 12.RemoteDrive directory.

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Part 2 – piRover_led Module

1. Review prior LED and Pushbutton lessons and code. You will need to control LED state turning each on and off. You will also need to implement a toggle function which turns the LED on if it is off and turns it off it is on.
2. Open the piRover_led.py file created during set up. Create the module including the functions shown below. Note that only the red functions are included in the screen capture. Implement on, off, and toggle for green and blue also.

piRover_led.py

```
''' Module to control piRover LEDs
'''

def led_init():
    #initializes RGB GPIO
    pass

def RGB_on():
    #turns RGB LEDs on
    pass

def RGB_off():
    #turns RGB LEDs off
    pass

def red_on():
    #turns the red LED on
    pass

def red_off():
    #turns the red LED off
    pass

def red_toggle():
    #turns the red LED off is current state is on
    #turns the red LED on is current state is off
    pass

```

Figure 1 - piRover LED Module Interface

3. Integrate the piRover_led.py module into the Remote Drive solution so that toggle functions are called when the LED buttons are activated in the smartphone application. The LED off button must turn all LEDs off.
4. Submit this work with the final PO3 project submission.