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3-3 Milestone Two: GPIO UART Lab

The encode() method is included in both the SerialTest-Write.py and SerialLightControl-Client.py scripts because the data sent to and from a serial connection needs to be in bytes (not a typical string). Because the serial port only reads and writes raw binary data, the string is encoded into a byte that is transmitted when we send the string. If we did not encode the string, we would receive an error in the interpreter because we would be attempting to send a string across the serial connection.

The decode() method is called in SerialTest-Read.py because data sent from the serial port to a Python program is in bytes and needs to be converted into a standard string before we can perform operations on it or print it to the screen. Decoding converts the byte stream sent from the client to a UTF-8 formatted text string. The try/except block is important to have in both the SerialLightControl-Client.py and SerialLightControl-Server.py because if anything is interrupted (for example by the user pressing CTRL-C or a connection error), the except block allows the program to stop cleanly. This will also end any serial communications and clean up the GPIO pins so that the Raspberry Pi will continue to work when we start a new program.

It is important to return the GPIO pins to their original state at the end of the program so that the pins do not remain configured as outputs or in a high state when we are not using the program. If these remain as outputs, they will keep any components powered on and drain the power supply. If they remain in a high state, this can lead to damage of the Raspberry Pi or other devices as it can cause other programs to conflict with this program.