Task 5.1 using input colors:

import tkinter as tk

from tkinter import messagebox

import RPi.GPIO as GPIO

# Setup GPIO

GPIO.setmode(GPIO.BCM)

RED\_LED = 17

GREEN\_LED = 27

BLUE\_LED = 22

GPIO.setup(RED\_LED, GPIO.OUT)

GPIO.setup(GREEN\_LED, GPIO.OUT)

GPIO.setup(BLUE\_LED, GPIO.OUT)

def turn\_off\_all\_leds():

GPIO.output(RED\_LED, GPIO.LOW)

GPIO.output(GREEN\_LED, GPIO.LOW)

GPIO.output(BLUE\_LED, GPIO.LOW)

def turn\_on\_red():

turn\_off\_all\_leds()

GPIO.output(RED\_LED, GPIO.HIGH)

def turn\_on\_green():

turn\_off\_all\_leds()

GPIO.output(GREEN\_LED, GPIO.HIGH)

def turn\_on\_blue():

turn\_off\_all\_leds()

GPIO.output(BLUE\_LED, GPIO.HIGH)

def handle\_input():

color = entry.get().strip().lower()

if color == 'red':

turn\_on\_red()

elif color == 'green':

turn\_on\_green()

elif color == 'blue':

turn\_on\_blue()

else:

messagebox.showerror("Error", "Invalid color! Please enter red, green, or blue.")

def on\_closing():

turn\_off\_all\_leds()

GPIO.cleanup()

root.destroy()

# Setup GUI

root = tk.Tk()

root.title("LED Controller")

label = tk.Label(root, text="Enter LED color (red, green, blue):")

label.pack(anchor=tk.W)

entry = tk.Entry(root)

entry.pack(anchor=tk.W)

submit\_button = tk.Button(root, text="Submit", command=handle\_input)

submit\_button.pack(anchor=tk.W)

exit\_button = tk.Button(root, text="Exit", command=on\_closing)

exit\_button.pack(anchor=tk.W)

root.protocol("WM\_DELETE\_WINDOW", on\_closing)

root.mainloop()