

```

1  """
2  Python script to control line-following robot and collect data
3  """
4
5  import serial
6  import pandas as pd
7  from pynput import keyboard
8
9  COMPORT = "/dev/ttyACM0" # Arduino port on Brooke's Ubuntu install
10 BAUDRATE = 9600 # Set baud rate for serial connection
11
12 # open the serial port
13 serialPort = serial.Serial(COMPORT, BAUDRATE, timeout=1)
14
15 # Create empty lists of values for data gathered from Arduino
16 dictValues = {
17     'Time': [],
18     'sensorLL': [],
19     'sensorCL': [],
20     'sensorCR': [],
21     'sensorRR': [],
22     'motorL': [],
23     'motorR': []
24 }
25
26
27 def on_press(key):
28     """
29     Keyboard listener to command Arduino
30
31     Args:
32         key (Key): key that has been pressed
33
34     Returns:
35         Key | False
36     """
37     if key == keyboard.Key.esc:
38         return False # stop listener
39     try:
40         k = key.char # single-char keys
41     except:
42         k = key.name # other keys
43     if k in ['0', '1', '2']: # keys of interest
44         # Send command to Arduino
45         serialPort.write(bytes(k, 'utf-8'))
46         if k == '0':
47             # If stop command, write data to CSV
48             data = pd.DataFrame(dictValues)
49             data.to_csv('./currentrun.csv', index=False)
50
51         return False
52
53 # Start keyboard listener
54 listener = keyboard.Listener(on_press=on_press)
55 listener.start() # start to listen on a separate thread
56
57 while listener.is_alive:
58
59     # Request data line from Arduino
60     rawDataLine = serialPort.readline().decode()
61
62     if len(rawDataLine) > 0:
63
64         # Split raw data into time, sensor values, and motor speeds
65         elapsedTime, rawLL, rawCL, rawCR, rawRR, motorL, motorR = (
66             float(x) for x in rawDataLine.split(',')

```

```
67
68     # Save datapoints to lists
69     dictValues['Time'].append(elapsedTime)
70     dictValues['sensorLL'].append(rawLL)
71     dictValues['sensorCL'].append(rawCL)
72     dictValues['sensorCR'].append(rawCR)
73     dictValues['sensorRR'].append(rawRR)
74     dictValues['motorL'].append(motorL)
75     dictValues['motorR'].append(motorR)
76
```