Problem

Problem 1: we need to create scatterplots using data that is recorded from the gyroscope data of a DualShock 4 controller

Problem 2: I need to edit a given C program to have correct formatting in its output. I also need to create three simple functions finish one other

Problem 3: We need to create a C program that takes input from a DualShock 4 controller and outputs how many buttons are being pressed

Analysis

Problem 1: Largely, I just need to follow the instructions in the lab report and type the commands with the correct input to run the ds4rd.exe and store it correctly

Problem 2: For the formatting, I just need to do just that , format, which is pretty simple. For the functions I just need to use the basic operations that are included in math.h such as square root and pow as well as modulo.

Problem 3: I need to scan the values from ds4rd into my program, and then write a function that will take this input and be able to output how many buttons are being pressed. I then just have to print in an understandable format how many buttons are being pressed

Design

Problem 1: I do just as mentioned above, Just run the commands given and then follow instructions to turn the gathered data into a scatterplot.

Problem 2: For the formatting part all I have to do is get the output to output in the correct format by adjusting the %lf. For the magnitude function I just have to use pow and sqr together to have it output the formula for magnitude. For the three functions to get minutes, seconds, and milliseconds I need to use division and modulo to get the given number into the correct segments and format.

Problem 3: First I made a scanf pretty much identical to the one in problem 2, then I create a function. This function takes 4 integer intputs and since each button only outputs a 1 or 0 to get number of buttons pressed I just need to output the value of all the buttons added together. After creating the function I just need to print it.

Testing

Problem 1: I ran the code but was not getting as much data as expected until I asked a TA and figured out that I had forgotten how the | works when recording output into a document. I changed how I was using the command and then had no issues

Problem 2: I ran the code but ran into some glaring issues at first with the functions that I had defined. I was confused by what It meant by the error of implicit definition, but I soon realized it was because I had to define the functions before they were called even if I didn't define what they outputted. My other issue that I ran into was the character area because I wasn't sure how to get leading zeroes in front of a number, however after getting help from the peers around me as well as the TA, I was able to figure out the issue.

Problem 3: I ran the code and it ran exactly as expected after fixing some forgotten semi colons.

Comments

Problem 1: I forgot that the reason I saw no output like I was used to was because the output was being recorded and so I was stopping the run time way too soon because I thought for some reason that I was just recording the already gathered data rather than recording data as it comes in. After fixing how I was using the command I got the right amount of data and was able to create the scatterplots

Problem 2: N/A

Problem 3: N/A

Screenshots

Screenshot for Problem 2:

```
Echoing output: 056.5120, -00.005, 000.004, 000.007
At 56512 ms, the acceleration's magnitude was: 0.010091
At 0 minutes, 56 seconds, and 512 milliseconds it was: 0.010091
Echoing output: 056.5270, -00.006, 000.005, 000.006
At 56527 ms, the acceleration's magnitude was: 0.010221
At 0 minutes, 56 seconds, and 527 milliseconds it was: 0.010221
Echoing output: 056.5430, -00.005, 000.004, 000.006
At 56543 ms, the acceleration's magnitude was: 0.009407
At 0 minutes, 56 seconds, and 543 milliseconds it was: 0.009407
Echoing output: 056.5590, -00.005, 000.004, 000.006
At 56559 ms, the acceleration's magnitude was: 0.009084
At 0 minutes, 56 seconds, and 559 milliseconds it was: 0.009084
Echoing output: 056.5740, -00.006, 000.004, 000.007
At 56574 ms, the acceleration's magnitude was: 0.010020
At 0 minutes, 56 seconds, and 574 milliseconds it was: 0.010020
```

Screenshot for Problem 3:

```
There are 1 buttons being pressed
There are 1 buttons being pressed
There are 1 buttons being pressed
There are 1 buttons being pressed
There are 1 buttons being pressed
There are 1 buttons being pressed
There are 1 buttons being pressed
There are 0 buttons being pressed
There are 0 buttons being pressed
There are 0 buttons being pressed
There are 0 buttons being pressed
There are 0 buttons being pressed
There are 0 buttons being pressed
There are 0 buttons being pressed
There are 0 buttons being pressed
There are 2 buttons being pressed
There are 2 buttons being pressed
There are 2 buttons being pressed
There are 2 buttons being pressed
There are 2 buttons being pressed
There are 2 buttons being pressed
There are 2 buttons being pressed
There are 2 buttons being pressed
```