

LAB REPORT

LAB #3

SECTION #2

FULL NAME

Alvin John Thomas

SUBMISSION DATE:

9/16/2023

DATE

9/12/2023

Problem

1: DualShock 4 Data Collection

Analysis

ds4rd.exe was downloaded and saved to lab03 folder.

Design

When I moved the controller, the outputted values changed.

Testing

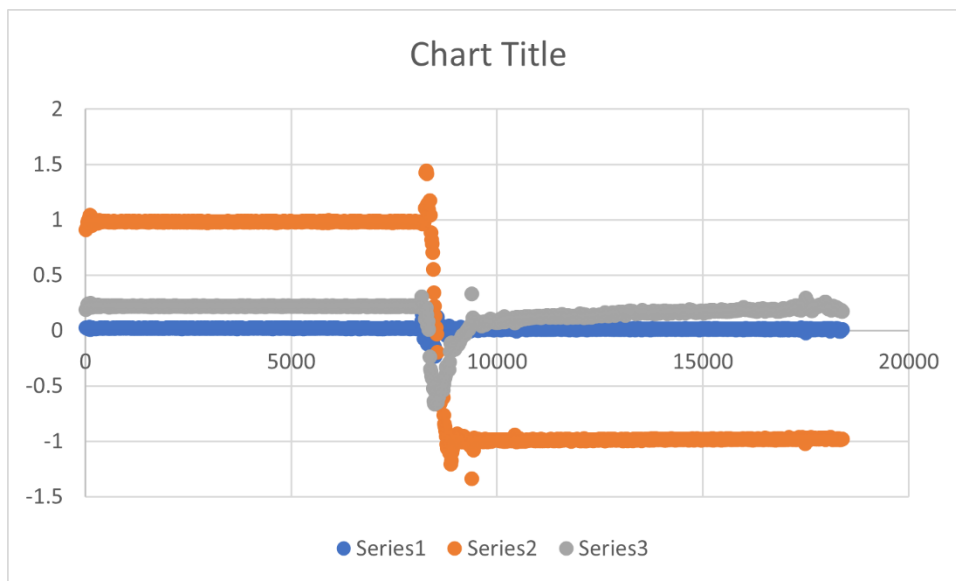
I took 3 data samples saved to a .csv file. I then opened them in a spreadsheet and created a scatter plot based on the values.

Comments

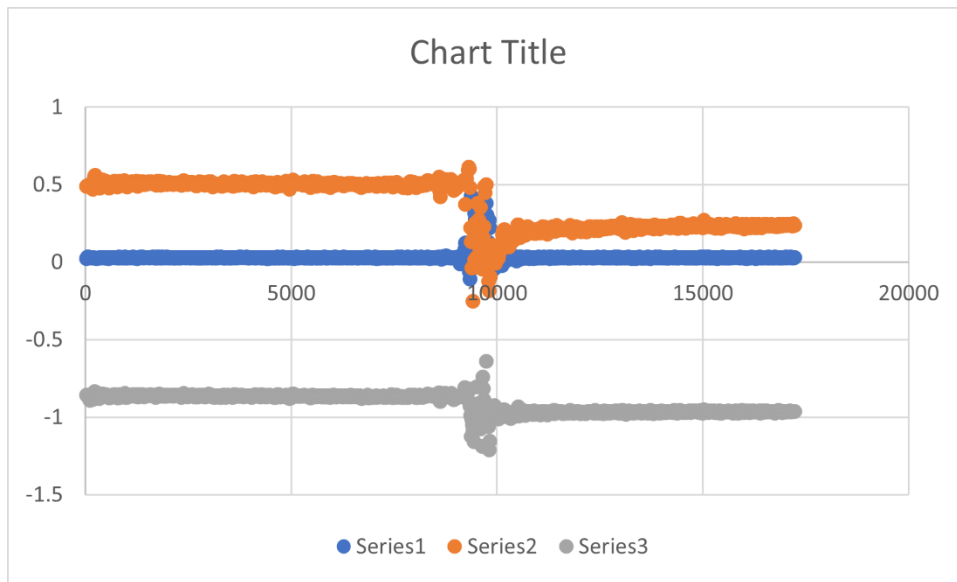
The scatter point changed as the values changed.

Screen Shots

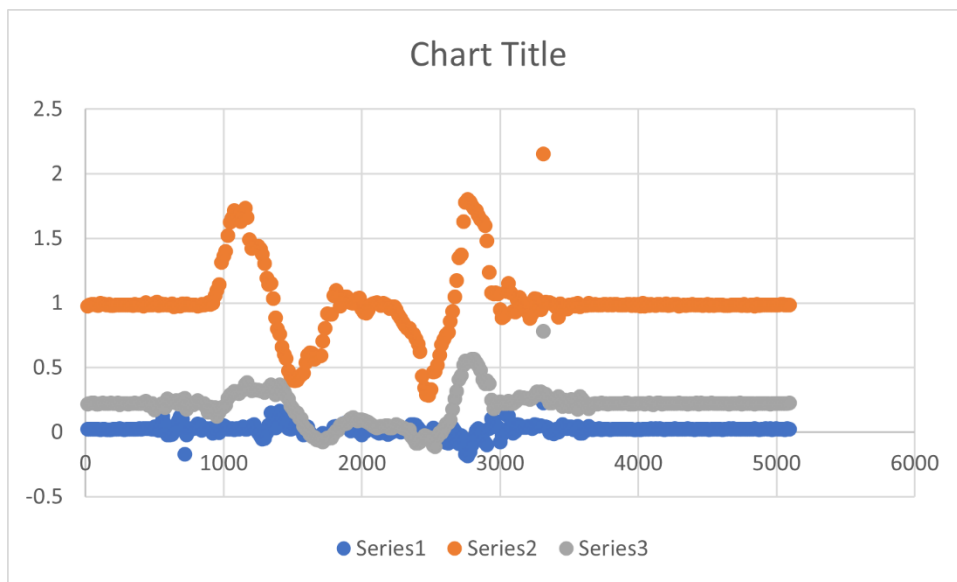
1.1



1.2



1.3



Problem

2: Write a function to calculate magnitude of acceleration. Also write three functions to convert milliseconds to minutes, seconds and milliseconds.

Analysis

Magnitude of acceleration is $\sqrt{x^2+y+z^2}$

Design

I wrote three functions which accept milliseconds and return values of minutes, seconds and milliseconds as integers.

Testing

I moved the controller around to see if the magnitude of acceleration changed.

Comments

I did not encounter any problems.

Source Code

/* _____

- SE 185: Lab 03 - Introduction to the DS4 and Functions

- Name: Alvin Thomas

- Section: 2

- NetID: alvin

- Date: 9/12/2023

-----*/

```
/*-----
```

```
-
```

Includes

```
-
```

```
-----*/
```

```
#include <stdio.h>
```

```
#include <math.h>
```

```
/*-----
```

```
-
```

Prototypes

```
-
```

```
-----*/
```

```
double magnitude(double x, double y, double z);
```

```
/*-----
```

```
-
```

Notes

```
-
```

```
-----*/
```

```
// Compile with gcc lab03-1.c
```

```
/*-----
```

```
-
```

Implementation

```
-
```

```
-----*/
```

```
int main(int argc, char *argv[])
```

```
{
```

```
    /* DO NOT MODIFY THESE VARIABLE DECLARATIONS */
```

```
    int t;
```

```
    double ax, ay, az;
```

```
    while (1)
```

```
    {
```

```
scanf("%d, %lf, %lf, %lf", &t, &ax, &ay, &az);
```

```
/* CODE SECTION 0 */
```

```
printf("Echoing output: %08.3lf, %07.4lf, %07.4lf, %07.4lf\n", t/1000.0, ax, ay, az);
```

```
/* CODE SECTION 1 */
```

```
printf("At %d ms, the acceleration's magnitude was: %lf\n", t, magnitude(ax, ay, az));
```

```
/* CODE SECTION 2 */
```

```
printf("At %d minutes, %d seconds, and %d milliseconds it was: %lf\n",  
minutes(t), seconds(t), milliseconds(t), magnitude(ax, ay, az));
```

```
}
```

```
return 0;
```

```
}
```

```
/* Put your functions here */
```

```
int minutes(int t)
```

```
{
```

```
    int m = t/60000;
```

```
    return m;
```

```
}
```

```
int seconds(int t)
```

```
{
```

```

    int s = (t%60000)/1000;

    return s;
}

int milliseconds (int t)
{
    int ms = t%1000;

    return ms;
}

/*
 * Calculates and returns the magnitude of three given values.
 *
 * @param x - The x-axis scanned values from the DS4 controller.
 * @param y - The y-axis scanned values from the DS4 controller.
 * @param z - The z-axis scanned values from the DS4 controller.
 * @return - The magnitude of the given values.
 */
double magnitude(double x, double y, double z)
{
    // Step 8, uncomment and modify the next line
    return sqrt(x*x+y*y+z*z);
}

```

Screen Shots

2.1

```
alvin@C02048-15 /cygdrive/u/fall2023/se185/lab03
$ ./ds4rd.exe -d 054c:05c4 -D DS4_BT -t -a | ./lab03-1
Echoing output: 0000.015, -0.001954, -0.002931, 0.001953
Echoing output: 0000.030, -0.002931, -0.003420, 0.001953
Echoing output: 0000.046, -0.002931, -0.004397, 0.001465
Echoing output: 0000.063, -0.003420, -0.004397, 0.001465
Echoing output: 0000.077, -0.003908, -0.003908, 0.001953
Echoing output: 0000.096, -0.003420, -0.003908, 0.003418
Echoing output: 0000.109, -0.002931, -0.003420, 0.005371
Echoing output: 0000.124, -0.003420, -0.002931, 0.003906
Echoing output: 0000.140, -0.004885, -0.002931, 0.002441
Echoing output: 0000.158, -0.004885, -0.002931, 0.002441
Echoing output: 0000.171, -0.003420, -0.003420, 0.001953
Echoing output: 0000.189, -0.002443, -0.003420, 0.002930
Echoing output: 0000.202, -0.003420, -0.003420, 0.002930
Echoing output: 0000.220, -0.003908, -0.002931, 0.001465
Echoing output: 0000.234, -0.003420, -0.004397, 0.002930
Echoing output: 0000.252, -0.002443, -0.003908, 0.002930
Echoing output: 0000.265, -0.002443, -0.004885, 0.003418
Echoing output: 0000.283, -0.004885, -0.002931, 0.004395
Echoing output: 0000.296, -0.001954, -0.004397, 0.002441
Echoing output: 0000.312, -0.002443, -0.002931, 0.003418
Echoing output: 0000.327, -0.002931, -0.003908, 0.003418
Echoing output: 0000.343, -0.002931, -0.003420, 0.002441
Echoing output: 0000.358, -0.002931, -0.003420, 0.001465
Echoing output: 0000.374, -0.002443, -0.002931, 0.003418
Echoing output: 0000.390, -0.003908, -0.002931, 0.002441
Echoing output: 0000.405, -0.003420, -0.003908, 0.000488
Echoing output: 0000.421, -0.003908, -0.003420, 0.001465
Echoing output: 0000.437, -0.003420, -0.003420, 0.002930
Echoing output: 0000.452, -0.002443, -0.003908, 0.002441
Echoing output: 0000.469, -0.002931, -0.002931, 0.001953
Echoing output: 0000.484, -0.002443, -0.004397, 0.003906
Echoing output: 0000.501, -0.001954, -0.002443, 0.001465
Echoing output: 0000.515, -0.003908, -0.003420, 0.002441
Echoing output: 0000.532, -0.002931, -0.003908, 0.003906
Echoing output: 0000.546, -0.003420, -0.003908, 0.003418
Echoing output: 0000.562, -0.002931, -0.002931, 0.002441
Echoing output: 0000.578, -0.003420, -0.003908, 0.001953
Echoing output: 0000.594, -0.001466, -0.002443, 0.004395
Echoing output: 0000.609, -0.002931, -0.003908, 0.001465
Echoing output: 0000.625, -0.003420, -0.002443, 0.002441
Echoing output: 0000.640, -0.001954, -0.003908, 0.003906
Echoing output: 0000.656, -0.002931, -0.005374, 0.003906
Echoing output: 0000.672, -0.003908, -0.004397, 0.001465
Echoing output: 0000.687, -0.003420, -0.004397, 0.003418
```

2.2

```
alvin@C02048-22 /cygdrive/u/fall2023/se185/lab03
$ ./ds4rd.exe -d 054c:05c4 -D DS4_BT -t -a | ./lab03-1
Echoing output: 0000.020, -0.0029, 00.0020, -0.0029
At 20 ms, the acceleration's magnitude was: 0.004582
At 0 minutes, 0 seconds, and 20 milliseconds it was: 0.004582
Echoing output: 0000.036, -0.0005, 00.0015, -0.0024
At 36 ms, the acceleration's magnitude was: 0.002890
At 0 minutes, 0 seconds, and 36 milliseconds it was: 0.002890
Echoing output: 0000.052, -0.0020, 00.0010, -0.0010
At 52 ms, the acceleration's magnitude was: 0.002393
At 0 minutes, 0 seconds, and 52 milliseconds it was: 0.002393
Echoing output: 0000.070, -0.0024, 00.0015, -0.0015
At 70 ms, the acceleration's magnitude was: 0.003204
At 0 minutes, 0 seconds, and 70 milliseconds it was: 0.003204
Echoing output: 0000.083, -0.0010, 00.0029, -0.0010
At 83 ms, the acceleration's magnitude was: 0.003239
At 0 minutes, 0 seconds, and 83 milliseconds it was: 0.003239
Echoing output: 0000.101, -0.0005, 00.0029, -0.0010
At 101 ms, the acceleration's magnitude was: 0.003127
At 0 minutes, 0 seconds, and 101 milliseconds it was: 0.003127
Echoing output: 0000.115, -0.0005, 00.0029, -0.0015
At 115 ms, the acceleration's magnitude was: 0.003313
At 0 minutes, 0 seconds, and 115 milliseconds it was: 0.003313
Echoing output: 0000.133, -0.0020, 00.0010, -0.0010
At 133 ms, the acceleration's magnitude was: 0.002393
At 0 minutes, 0 seconds, and 133 milliseconds it was: 0.002393
Echoing output: 0000.146, -0.0020, 00.0015, -0.0010
At 146 ms, the acceleration's magnitude was: 0.002630
At 0 minutes, 0 seconds, and 146 milliseconds it was: 0.002630
Echoing output: 0000.163, -0.0020, 00.0010, -0.0005
At 163 ms, the acceleration's magnitude was: 0.002239
At 0 minutes, 0 seconds, and 163 milliseconds it was: 0.002239
Echoing output: 0000.178, -0.0015, 00.0015, -0.0020
At 178 ms, the acceleration's magnitude was: 0.002848
At 0 minutes, 0 seconds, and 178 milliseconds it was: 0.002848
Echoing output: 0000.194, -0.0020, 00.0010, -0.0015
At 194 ms, the acceleration's magnitude was: 0.002631
```


Problem

3: Write a program to count the number of buttons being pressed on the controller

Analysis

When a button is pressed the value changes from 0 to 1.

Design

I wrote a function which added up the values to know how many buttons are being pressed.

Testing

I tried pressing different combinations of buttons on the controller to see if it outputted the correct number of buttons being pressed

Comments

I did not encounter any problems.

Source Code

```

/*-----
-                               SE 185: Lab 03 - Introduction to the DS4 and Functions
-                               Name: Alvin Thomas
-                               -
-                               Section: 2
-                               -
-                               NetID: alvin
-                               -
-                               Date: 9/16/2023
-                               -
-----*/

/*-----

```

- Includes

-
-----*/

#include <stdio.h>

#include <math.h>

/*-----

- Prototypes -

-----*/

/*-----

- Notes -

-----*/

// Compile with gcc lab03-2.c -o lab03-2

// Run with ./ds4rd.exe -d 054c:05c4 -D DS4_BT -b | ./lab03-2

/*-----

- Implementation

-
-----*/

int main(int argc, char *argv[])

{

int triangle;

int circle;

int x;

int square;

while (1)

{

Screen Shots

[illegible]