TITLE

Conditionals

LAB # 05

SECTION # 08

FULL NAME

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Problem

For this lab I had to determine which direction the DualShock 4 controller was facing, and output that direction every time it changed, and the controller was not moving. I also had to use at least 3 different functions, and make the triangle button end the program.

Analysis

For this problem, I had to take input of the controller's gyroscope, as well as its moving average in each direction. I also had to take in the triangle buttons value. I had to use all of this information to determine if the controller was moving or not, and which direction it was facing.

Design

When thinking about how to make this work, I originally thought that I would need a way to figure out if the controller is moving, and a function to determine which direction the controller was facing. In order to do this, I needed a function to figure out if the value was close to the point, so that there is some tolerance. I made one function to determine the orientation, one to determine the magnitude, and one to determine if the value is close to the point. For my tolerance values, I picked .125 for the magnitude, and .2 for the orientation. I picked these after testing around a bit and finding values that I thought felt good. I decided that my orientation function should return a string with the orientation, which allowed me to compare it with a string variable to determine if it was a new orientation or not. To do this I had to use some of my prior knowledge about pointers, because in C you cannot return an array or string from a function without the use of pointers. Due to my use of pointers, I had a small issue with my function returning NULL sometimes, but I was able to fix that with an if statement to make sure it is not equal to NULL. When making the close to function, I just made it check if the value was between the point + tolerance, and the point – tolerance. I also realized that the close to function had to be called a lot to check if the orientation was close to what 1 or -1 and if the magnitude was close to 0.

Testing

When testing the program, I had to make sure that it output the correct orientation and did not output the same direction multiple times in a row. My first test of my program, I only had it outputting the orientation, it did not check if it was a new orientation. All of my orientations were mixed up, so I had to switch around variable to make it output the correct directions. I then had to test if my program would only output when the controller moved to a new orientation. I also made sure to test that my program would end when pushing the triangle button.

Comments

This lab taught me a lot about using functions and loops. I learned that in order to have a function output an array or string, you need to use pointers. I also figured out how to make a function only output when the value changes. I also got a better understanding of how the -g and -a flags for the DualShock 4 controller work.