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Final Project Paper

CSCE 155

When thinking about ideas I could do for this project, I initially wanted to do something that pertained more to my major, mechanical engineering. However, after mulling over a few ideas that intrigued me I realized that many of them were far out of my skill level. Coding has never come easily to me and that was honestly one of my biggest limitations in this project. I then started thinking more along the lines of something I could maybe use in any future math classes I would have to take. Currently, I am taking Calculus 3 and the big change in that class is the jump from two dimensions to three. My initial thought was to create a GUI that graphed multivariable functions in 3D that was able to swivel. Something similar to what websites like Calcplot3d have, but simpler and more concise. To go along with the graph, I wanted two sliders that could adjust the axis limits and some text boxes that output the x and y derivatives of the function. Quinn gave me the go ahead on this idea, but this was obviously very audacious, I then decided to make it only 2 dimensions and make it into a plot that specialized in graphing trigonometric functions. I really wanted to keep the idea of a text box that output the derivative of whatever function was being graphed, but after a few of my own attempts and then some pretty extensive online research I found out that it is pretty complicated to display mathematical functions in GUI text boxes. Some people online even went as far as calling it impossible. While I don’t necessarily know if that is true, nothing I tried or found online really came even close to working. The problem seems to lie somewhere in getting the code to recognize a variable that has had a function assigned to it. So, in the end I settled on the idea of just having the user enter whatever trig function they want to graph, and then replace the x variable with a specific number and it will display the exact value of that function when a button is pressed. I was able to successfully do this, but it is by no means advanced or as smooth as it could be. I would have loved to be able to sink an edit box with this system and allow the user to change whatever value they wanted on the fly, but it just wasn’t in the cards for this project. When it came to the scrollbar idea, that was definitely a little more straightforward. I did in the end decide to scrap the idea of having two scroll bars. When I was researching how to do it, it seems you need to sync the minimum of both the y and x axis to one and the maximums to the other. This sounded pretty complicated, and I couldn’t find any great videos or examples that demonstrated this. Quinn did a really good job of teaching how to initialize the scroll bar in class, and it only took me a few google searches to find out how to sync the maximum of the x axis up with the scroll bar and then from there it was just perfecting the values of the window size.

I am really thankful for the excellent teaching of Quinn and the great coding community that is always there to help each other out and are quick to respond to any struggles a fellow programmer has. At this point there really is seemingly an endless number of helpful responses out there for people to use and adapt to their own specific code. Sadly, in the chaos of end of semester studying for exams and having tens of tabs open at once I did lose some of the great online forums I used to get my code to where it is now. However, I will link the ones I still have saved. To be honest, I am not someone who really enjoys the process of coding and I honestly found this class quite stressful. I took a coding class in high school and hated every second of it due to a lazy teacher who only catered to a small group of students who had large amounts of previous experience. Sadly, I feel like this a recurring theme in computer science classes. Due to this, I was not looking forward to having to take this class for my major. However, I can gladly say that this class was extremely well taught and administered all around. Quinn did an absolutely perfect job in conducting this class and was one of the best professors I have ever had, and the LAs were also very helpful throughout. I am very thankful to have taken this class when I did, and I can’t express my gratitude enough to the whole CSCE 155 team. Thank you!

MathWorks articles used:

<https://www.mathworks.com/matlabcentral/answers/347733-how-to-make-a-slider-gui-with-most-simple-code>

<https://www.mathworks.com/matlabcentral/answers/67696-how-to-show-symbolic-equation-answer-in-gui-controllers-like-static-text>

<https://www.mathworks.com/matlabcentral/answers/155660-gui-adjust-axes-values-with-2-different-sliders>

<https://www.mathworks.com/matlabcentral/answers/275187-functions-and-plotting-in-gui>