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CSCE155N

Final Project

When beginning this final project, I wanted to do something that is math-related, as I am a mechanical engineering major, and I still have quite a bit of math courses to complete before I graduate. Of course, math will be a huge part of my career as an engineer, so any tools that I can pick up to use to confront math problems will be incredibly useful. In the future, I would like to get better at GUIs in general so that I can use them for a plethora of math problems. For now, a manageable problem was a simple graphing problem. I decided to plot a simple function,

f(x) = xa

where “a” is an integer of the user’s choice.

In this report, I want to discuss the method I used in designing this program, difficulties I had along the way, and how I will use GUIs in the future. It may be pertinent to mention at this point that LA Thien Cao gave me the green light to work on the aforementioned project on Friday, April, 29th, 2021.

The way I began working on this project was by considering the different steps I would need to take to be able to set it up. This involved deciding what format the buttons would be in and what the buttons would do. I also decided it would be best to have a refresh button for the plot so that the plot didn’t refresh whenever the value of a was updated because that would cause the plot to update way too often and would slow down the code considerably.

I decided it would also be best to have a master function and several smaller functions in order for the buttons to work well. I took inspiration from lab10 and used it as a reference to make sure I had everything formatted correctly and had my syntax correct. Once the user created their function using the buttons, it was time to plot the function. For the plot, I took inspiration from lab05, again using it as a reference to make sure my formatting and syntax was correct.

The greatest difficulty I had was with one of the buttons, specifically the refresh button. It turns out that I forgot to have enough input arguments for the callback function from the button. Since I was simply calling the refresh (makePlot()) function without input, I thought that the subfunction could just be called “makePlot().” After fiddling around with it for a while, I realized that in order to have the function be called from a button, it had to be “makePlot(source,event).” The reason why I thought it could just be called “makePlot(),” and ultimately how I figured out the correct formatting, is that the function worked just fine as “makePlot()” when called directly from the master function, but there was an error when it was called from the button. That error made me take another look at the formatting of buttons and that’s when I realized that it had to be “makePlot(source,event).”

GUIs will likely be a very important part of my future, not least because of my chosen career in mechanical engineering. I always like to make things as efficient as possible. The way I apply that in my everyday life is by doing things as trivial as calculating exactly which route is quickest from any given location to any given location. I’m loathe to use Google Maps mostly because it doesn’t give the fastest route, but rather the route that’s easiest to follow. Implementing GUIs in my life would be a huge advantage for doing anything that can be automated. One example of using a GUI is to create an interface with common equations from the fields of math, engineering, physics, and others so that they are all easily accessible. Another advantage of writing my own code is that I will have to understand and will come to learn the material a lot better in order to apply the laws of physics and math in my code so that it actually works. Thus, not only will my life be easier because I have automated a significant portion of busywork and algebra, but also, I will understand more fully and clearly why exactly the math I learn in class applies to the problem in general.

This project has inspired me to play a more active role in automating the tedious aspects of my life so that I can spend time enjoying the things I’d rather enjoy. Although this project is only a very simple example of the power of GUIs, I’m excited to learn more about them and implement more and more practical and complicated GUIs in my life.