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**CSCE 155N Final Report**

**Design and Coding Process**

I went into this project without a whole lot of preparation or planning, and although this made the project a bit more difficult, it caused me to learn a lot throughout the process. I didn’t go into it with much of a plan; my idea was more of a guess-and-check-method and to plan as I went. However, this backfired a little as I progressed through the program because the elements were a bit of a mess on the figure and it slowed down the process. I was putting elements on the screen without thinking ahead with the reasoning, “I’ll just organize them in the end”, but this ended up costing me a lot of time. When I was about halfway through programming the edit boxes, I decided to get out a piece of paper and sketch out each element, thinking ahead to all edit boxes, text boxes, radio buttons, and plot elements that I wanted to be on the screen in the end. This sped up the rest of the process a lot, and I realized that spending more time on a plan beforehand is worthwhile because it assists in speeding up the rest of the process.

Apart from the mess of beginning to code my edit boxes, I would say that I was fairly organized during the process of programming this. I made sure to add comments as I went, especially on things that looked complicated or I thought I would forget, and this allowed me to navigate and edit my code with ease. At the end, I organized all my comments and added a few more so that the structure was more uniform and it would be easier to read for others. I’m glad I was consistent with using comments and put time into making them easy to read because it made my code a lot more readable in the end.

There were a couple of things I added that weren’t in the original instructions for this project, the main one being my error messages for the x and y limits. When I was testing out my edit boxes and making test plots, I realized there was a lot of room for error with the x and y limits because you could leave one of the limit boxes blank with the other one filled, or you could enter a larger number for the minimum than the maximum. To account for this, I made two error messages: one that said, “Please enter numerical values for both of the limits”, and another that said, “Please enter a larger number for the second limit.” The first error shows up if str2num() is empty for only one of the two limit boxes, meaning either the user entered something non-numerical for that box or left it blank. The second error shows up if the user enters a larger value for the minimum limit than the maximum.

**What I Learned**

I learned a lot of new things from this project, one being that I should always make a plan before starting a new project, as I mentioned earlier. If I were to redo this project, I would definitely start it by sketching out the figure I have in mind first, figure out the positions that I want the boxes to be in, and then start the coding process. I learned some new commands while coding this, like get() to retrieve a string from an edit box and set() for setting details of a plot (like the position in the figure). I also learned how to code new uicontrol elements like radio buttons and edit boxes. I found the MathWorks website incredibly useful for these new concepts because there were many things I wanted to do with my code that I had little to no experience with, and this site was great at explaining how to do this.

**Use of GUIs**

GUIs are very useful and have many applications. They allow us to be able to code without having to learn commands for every single detail, making programming much more efficient and simple. There are many ways I could use GUIs in the future; a project with a plot like this could be useful for future labs I have as it’s a quick and easy way to graph data, or I could even just create any game I want for fun. There are endless possibilities with GUIs, and I’m glad I got experience with them in this course. I learned a lot throughout this project and it took a lot of work, but it was definitely worth it in the end.