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CSCE 155N

Final Project

I began this project by meeting with Mac Ozanne, an LA for CSCE 155N. I told her my idea of creating a program where the user inputs various unfactored loads, and they are returned a max factored load. She told me that this would be a good way of implementing all the UI controls that I would need; however, I would need to have the program do another function so that a second callback function could be utilized. I then brought up the idea of having the program calculate a moment at a specific location on a simply supported beam under uniform loading. She then told me that a program with these characteristics would be able to have enough elements for the final project’s requirements. Knowing this, I began work on my .m file.

Much of the programming went by very quick for the final project, but I came across several issues. I was able to get the textboxes, editable textboxes, and buttons into the figure without much trouble. I needed textboxes to label everything on the figure. I needed the editable textboxes in order for the user to be able to input the specific unfactored loads they want factored as well as provide a location for the users to input the moment location and length of the simple beam that they were working with. The purpose of the factor button was to give the user the ability to tell the program once they had input all the unfactored loads that they were dealing with and have the program calculate the factored load at that time. Similarly, the purpose of the moment button was to give the user the ability to tell the program once they had input the moment location and length of beam so that the program could calculate the moment load at that time. The first difficulty that I came across involved the positioning of the numerous UI controls that are a part of my program. It was an iterative process to get all the elements positioned so that the finished product looked well done. This was because I had to deal with text wrapping down to the next line in the middle of words due to the textboxes being too small. Additionally, I had to make sure that there was uniform spacing between elements and no overlapping. The next major difficulty that I came across was getting the push buttons to operate properly. I was very uncertain about how to carry the information from the text fields to the program through the use of push buttons. When I clicked the buttons on the figure, I always received errors telling that there were too many input variables being sent to my callback functions. I re-watched some lectures from this course as well as looked up YouTube videos on the topic, but I was unable to get the program to run without the errors popping up. As a result of this, I decided to contact Mac Ozanne again to see if she could help me with the issue that I was encountering. She informed me that callback functions automatically start with the variables source and event, and since I don’t actually need either for my program, I can simple put ~’s for my callback function’s inputs. After this issue was resolved, I realized that my load combination equations were accessing only the editable textbox variables and not the inputted strings. I remedied this issue by putting .String after each instance and made sure to use str2num. Once these corrections were made, my program started operating properly.

Regarding GUI’s that I might put into this program at a later date, I think that it would be cool to plot a moment diagram for the uniformly loaded and simply supported beam. This plot could be positioned in the top right section of the figure where there is currently a blank spot. This plot would utilize the user-inputted data for X and L as well as the determined factored load. These inputs would allow for a moment diagram to be plotted and a point to be plotted at the location of interest (X).

I think that this final project was extremely helpful to improve my understanding of uicontrols. With my newly found ability to utilize editable textboxes, textboxes, and pushbuttons in MATLAB, there are countless possibilities for future programs that I can design. Thank you for your help throughout the semester, and I am truly appreciative for everything that you taught me.