**FINAL PROJECT**

This is the final project for Matlab 155. It was a cooperative effort by Scott Smith and Jedman Stonacak. The report as you can expect had a lot of difficulties and frustrations. In total effort we would estimate this at a 40 hour project with cumulative hours.

As an engineering student with one semester left. I can say this project and this class have bent my mind and challenged my sanity.

**CONVERSION CALCULATOR**

The GUI we present today is a conversion calculator. In heat and mass transfer as an engineer, I have needed to get online on multiple occasions to type in values to get converted values for the sake of finishing problems and projects. This tool would have been helpful to be able to accomplish that task.

**APPROVAL**

We were approved to do that calculator by Ms. Lanik through an email on 4/27/2021, under the wrong assumption that the LA’s were done for the semester. Her advice was to use a radio button. With all of the issues we had with completing the tasks and time running short we decided to forgo the radio button for the GUI so, but I believe the set up is very user friendly and would make the user experience as useful and obvious as a radio button. (Perhaps in your feedback you can share if you thought your experience is as I suspect).

**LAB 10 and LECTURE FROM 19 APRIL 2021**

The GUI that we built is primarily based on Lab 10 and the Lecture from April 19th. We tried to incorporate most of those ideas, we didn’t see how a plot would add to the user experience so we went with just the pushbuttons and edit box, with an answer display. The code at one point was highly convoluted and worked correctly, yet, we decided for the ability for a person to recreate the GUI with other conversions it would be best to try to simplify. So, to that end a look at the code hopefully will prove to be simple and elegant with the intention of being able to make small adjustments so there can be many different conversion calculators built using the code we built.

**AT LEAST 2 WORKING CALL BACK FUNCTIONS**

The two callback frunctions that are in are project involve the following:

1) The radio button has a callback function involved

2) Conversion with hfluxlbm and hfluxlbs

**AT LEAST 3 INDEPENTDENT UI CONTROLS**

The UI controls involved in this project are as follows:  
1) An inputValueMessage which tells what the inputs are that are inserted into the edit box.

2) The Edit Box that takes in the input which is then drawn from in the callbacks.

3) The Radio buttons that would indicate what is going to be the input.

4) The conversion pushbutton.

5) The output that shows what the new value is.

**DIFFICULTIES**

The title and labels of the figure were relatively straight forward because we had done those in the past and have seen it a few times, so we had no real difficulty building it. The location of the figure title, gave us difficulty just with a correct alignment and how to make sure it had enough characters available to be able to carry the entirety of the message.

On the output section if you run a large number there will essentially run more than one line, in using heat flux, with my very small amount of knowledge, I can’t imagine that would ever happen. This feature, I feel is good for the user to be able to see more characters if needed.

The Edit Box was by far the hardest part of our project and is what took up about 60 percent of our time. Our main problem in the beginning was when we would have the edit box it would never output anything, we found this to be a problem in the code down in the equation portion of the code, where we were doing the callbacks. So, of the things we did to try to rectify the issue was getting on Mathworks.com and trying to watch multiple examples, we got on Reddit to the Matlab subreddit and we went to office hours on three different occasions and worked with Caitlin and Thein to try to find out why we couldn’t get an output to show up in the GUI. In the end, we were able to figure out why we didn’t have an output by going through lab 10 and finding how the callbacks and num2str needed to be set up.

I feel the most irritating part was that we tried so many different things and none of them worked. It felt like we had hit so many dead-end roads and when we did, we have nowhere to turn. I am still not sure how to approach that in the future if I do in fact start to code more.

The radio buttons because of the lecture from 19 April we were able to capitalize on those and get them to work really nicely.

The pushbuttons again were relatively straight forward, because it did nothing but take in the values from the radio buttons and do the equations.

**ERROR IS SHOWING**

The conversions work perfectly, why the heck do I get an ERROR in Matlab when I select a different radio button? I cannot figure it out?!?! The code all seems to be correct and the conversion works as advertised. So, because of time, I am admittedly turning in a code that works perfectly and is kicking out an error when a radio button is pressed.

**CONCLUSION**

This code I believe can be valuable to me in the future to be able to make more conversions with relative ease. I can set it up with the equations and just input. It would have been nice to have this at the beginning of the year, because of the complicated equations I had to put into my TI-inspire over and over again. And, as usual I have so much to learn.