**GUI for Chemistry Kinetics**

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The first step when approaching this final project was to make sure that we both understood the basic functions of Github. Through the completion of lab11, we were provided with some clarity on how to create different branches and their functions as a whole. We didn’t necessarily have a plan for how we were going to split up this project, and instead figured it out as we went along. We met up throughout the week and weekend in order to clearly communicate our ideas and how we wanted to approach splitting up the work.

Janelly was the one who came up with the initial idea behind out project and presented it to the LA during one of the office hours sessions. We are both chemical engineers and wanted to create a project that would tie well into something we’ve learned recently. In our chem class, we were taught the basic principles of zero, first, and second order reactions. Each reaction has a different equation associated with it, which gave us the idea to have three different GUI functions. There were also “buttons”, each of which had a callback function which included the different reaction equations.

A multitude of challenges were faced when attempting to write the code and clone the code in Github. An initial challenge was figuring out how to share the code among each other. Only one of us were able to work on the code at a time which limited how much code we were able to write in a specified amount of time. We met up multiple times in order to complete the code together as otherwise it became too complicated to push and pull the code while also understanding what the other individual completed previously due to Cassidy having a Macbook. The git push and git pull on the repository became a hurdle at moments and we were unable to figure out why. Due to the complexity of this, we had to remake our repository twice as there were times when our code wouldn’t commit and we were unable to push or pull it. Additionally, ensuring each line of code worked and made sense became difficult as more details were added. There were more aspects that we wanted to add to our code for example: being able to have all three functions appear on the graph at the same time, have numbers not in ascending/descending order, and provide more GUI functions. In zero, first, and second order reactions, the values (yValues in this case) must be in either ascending or descending order. If these values are not presented that way, our graph turns into a bit of a mess. Unless the individual who is testing our code understands that, they may see the graph as being disorganized.

GUI’s offer many positives when writing code. To the individual that is running the program/code, the GUIs make everything much more organized and quicker. As a reference, in our repository, we provided four different GUI functions that allow for the user to make better use of our code. They can simply enter values and click any of the GUI buttons to receive a result. This could be used in almost every field of interest.

Another application in chemical engineering where the GUI function can be utilized is understanding a mass balance. There are different inputs and we need specific outputs. Most of the time, the equations associated with the different mass balances become too complicated to solve by hand, so having an input box with a button that solves equations with those values would save us a lot of time. There are endless possibilities for the GUI function, especially in chemical engineering. Another example could be creating a model for balancing reactions and making sure to take note of things like ion charges. It could also have options for balancing a normal reaction or a redox reaction which intakes other factors such as Hydrogen and Oxygen atoms.

Overall, this project was an interesting task as it had us coming up with our own idea from scratch rather than having a base idea like the homework and labs. It also was fun to try and navigate a new program and working with a partner as that was not something we got to experience much this semester.