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| **Take-home assignment (Individual): Reflect on your model (due beginning of class 10/02)** | | | |
| **What approaches did other students take with respect to the data that they used (justifications, assumptions, and limitations) and the way they programmed their model? Be as detailed as possible in listing various differences between models. For each difference talk about WHY you think the other group chose to do it the way they did. Be detailed.** | | | |
| 1. **Other groups calculated the thermodynamic properties once and left it at that.**   Thermodynamic properties are a strong function of temperature and change depending on the system temperature. In my model, for each slice and timepoint, I recalculated the heat capacity, the conductivity, and the density. This is more accurate because it gives us a more representative look of the system. Assuming one value for each and proceeding can lead to inaccuracies. However, the reason they made these assumptions is that it is clear the values wont change much at all, and the benefit of a small increase in accuracy doesn’t justify the over-complication and the increased needed computational power.   1. **The other groups assumed convection away from the surface as opposed to simple conduction.**   For my model, I found significant difficulty developing the equation for convection away from the surface during cooling. To make the deadline, I had to just assume simple conduction and solve the system that way. This was not ideal but was necessary to complete the assignment on time. Other groups were able to develop the equation on time and had a more accurate model in the end.   1. **One other group assumed best case scenario for vitamins.**   In order to maximize efficiency, one group chose to assume the best-case scenario for the destruction of vitamins (i.e. slowest destruction time). They did this so they could claim certain system aspects that are within the range of the given parameters. My team chose worst case scenario to make sure that we know how bad the vitamin destruction can get. | | | |
| **How did these differ from your own approach? When would your own approach make the most sense? When would different assumptions that other groups made make the most sense?** | | | |
| Differences I saw:  **Some people simplified the thermodynamics, others made it more complicated.**  **Some people used while loops, others used for loops**  **Some people assumed worst case scenario, others assumed best case scenario** | What approach makes the most sense:  **Simplified thermodynamics makes sense for here**  **A for loop is always safer than a while loop**  **One should always consider the worst case scenario when health and safety is on the line.** | | Why the approach makes the most sense:  **This is not a permeant process, and simplified is good for a temporary analysis.**  **For loops have a defined end point, while loops are undetermined**  **See the choice** |
| **If you were to do this assignment again what are different assumptions you would make and what do you believe to be the optimal solution to the problem?** | | | |
| Things I would do differently:  **I would reconsider the convection at the outside.**  **I would spend more time condensing my code into functions.** | | Why I would do them differently:  -This will increase the accuracy of our model and provide a better solution.   * This will decrease the required liens of code, improve maintainability, and increase efficiency. | |
| **What was the most challenging piece of this assignment?** | | | |
| **Getting the finite difference method to work within MATLAB was difficult to achieve. There was a lot of debugging and I ran into a lot of issues.** | | | |
| **Why do you feel that was the most challenging?** | | | |
| The finite difference method is easy to understand when you lay out the data into a table. One can see exactly where all the various temperature data-points are coming from, and it is easy to be clear and concise. It is also easy to change equations for specific boundary conditions.  In MATLAB you lose this visualization and it becomes difficult to code. It also is hard to code in conditional statements that deal with specific boundary conditions and equations. | | | |
| **How did you overcome this challenge?** | | | |
| Writing out the matrices on a piece of paper helped a lot. It helped me visualize what was going on and made the coding/structuring of the for loops much easier to overcome. In addition, it made the conditional statements easier to code to deal with boundary conditions. | | | |