Math 490 Capstone Weekly Report Week Number: 9

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My goals for this week were to:

1. Finish all of the definitions for the category of lenses over **Set** and **Euc**.

2. Program the necessary functionality for lenses in Python and/or Julia.

3. Start work on the Moore machine example.

4. Finish the rough draft of my project summary and the introductory sections of my final paper.

5. Decide on consistent, readable notation for all the category theory definitions and diagrams. There are a few options for membership in the class of objects, homsets, composition of morphism, etc.

I made the following progress on these:

I finished the necessary definitions for lenses with some formatting help from Dr. Menendez. I did write a rough script for working with lenses in Python but it's not working quite right at the moment. The way the composition and monoidal product functions work right now leads to deeply nested tuples that are difficult to work with: you have to work a good chunk of the problem by hand to be able to use them accurately, at which point why are you using a program? To do this testing I created a simple toy example with a couple of Moore machine. For the next iteration I'll look into how to flatten the tuples in a way that's consistent and gives the intended results.

I also did a lot of writing this week and, while writing, made some choices on notation. I finished the rough draft of my project summary and sent it to Dr. Menendez for review, and I finished the rough draft of my paper's introduction and the first section on the category theory basics. I started on the next section on universal properties but got wrecked by a high fever. I haven't done any work in the last few days.

I have the following questions and concerns I want to discuss with my capstone advisor:

I want to talk to my advisor about my project summary.

Some tentative goals for the coming week are:

1. Feel better.

2. Look around to see if someone else has already solved my coding problem. If not, solve it.

3. Write some more of my paper. Revise my summary and turn it in.