Unit 3 Status Report

Date: April 28, 2022
To: Mr. Fulk
From: Anish Lakkapragada, Hank Hsu, Abhishek Nambiar

Subject: Week 1

Accomplishments:

Anish has started to design the Java classes to read functions in String form (e.g. "3x^2 + cos(x)") into a numerical value in Java. All of us (Anish, Hank, Abhishek) researched in class, looking for libraries that would aid this challenge, and decided to use the open-source Expr library to read functions (as Strings) in Java. Anish has tested it out to make sure that it will work before the team committed to using this library.

Together we have all discussed to specify the details in our project idea - instead of having two computers take in functions in the text field input - we have the user play a game where they move to different tiles (each with a different labeled mathematical expression) to create the differentiation function. For example, if you wanted to create the function "3x^2 + 2x" as your answer, you would have to move to the tiles that had 3x^2 and 2x. This still will require a lot of the same mathematical functionality in our application.

All of us this week have explored coding GUI in Java by coding along with tutorials to understand how the Java Swing Library works and how we can add components like text fields, buttons, etc.

Problems/Risks:

Even though we are using the Expr library to analyze functions, one problem we see is that it may fail on extremely special corner cases in the difference between how humans write functions and how Expr will interpret them. It is

likely that we will need to do some string processing on a function before feeding it into Expr.

Another risk/big difficulty we forecast is structuring the GUI into many different classes (e.g. Tile Class, driver class, etc.) to make the code cleaner instead of writing all of our methods and event listeners for the GUI in one class.

Next Steps:

Hank will implement the Differentiation class next week to take in functions in String form and test whether they are the correct derivative of the function the user was supposed to differentiate. We plan to do this by applying the limit definition of derivative and applying the user-generated derivative function (via Expr) on a list of test cases and comparing them to see if they are less than a certain small value.

Meanwhile, Abhishek and Anish will be working on separating the GUI components into different classes next week and drawing the class diagrams for each of them.