Mad 105 – Android 1 Project Proposal

My plan is to create a simplified version of my iOS app called Row Reduction.

Here’s a couple screen shots from my iOS app.

A screenshot of a phone

Description automatically generated with medium confidenceGraphical user interface, application

Description automatically generated

Note: The image on the left shows the calculator buttons. I probably won’t use the +eqn or +Var because I don’t know how hard it would be to make this dynamic yet.

My focus would be on getting the coefficients from user, letting the user choose a row operation (second picture), get the user input for the row operation (don’t have a picture) and then update the augmented matrix.

1. The user will enter the number of equations and variables. To keep it simple, I may just fix it at 2 equations and 2 variables if it’s too complicated right now.
   1. Layout should look like a calculator (0 through 9) and a negative button. I have a picture at the end of the file to demo.
   2. Ideally, the user can use swipe gestures to move from textbox to textbox to enter the numbers.
   3. If that’s too complicated, I can add a left/right/up/down button to move to a new textbox.
2. I’ll validate the data. Should be an int or double. I don’t know if Android has a way to display a decimal as a fraction. I’ve seen swift code that would take 0.25 and output [1,4] or 0.1111… as [1,9]?. Either way, a double will work. It just won’t look as pretty.
3. Transition to a page that displays the problem as an augmented matrix. Formatting will be important. Not sure how I’d do that yet. Should look something like this

1 2 | 8

3 2 | 16

This matrix would be stored as an array of doubles. Probably create a class called Matrix.

1. The user has three row reducing operations (buttons) to choose from at the bottom of the screen. Probably easiest to open a new screen to get input.
   1. Operation 1: requires two int inputs
   2. Operation 2: requires one double input and 2 int inputs
   3. Operation 3: requires one double input
2. The user’s choice and input will modify the matrix and display it to the user. After one operation the new matrix could look like this

1 2 | 8

1. -4 | -8
2. They continue choosing one of the three operations until the matrix is in row reduced form.