**Introduction**

For this project I have created a GUI based Grocery billing system. The system allows the user to add items one by one, update and remove rows by entering the item code, and calculate the total amount due with/without special discounts for certain items. The opening screen shows a table with transactions on the right of the screen and the Login, Add, Remove, Update, and Print buttons on the left of the screen. The purpose of this billing system is to keep track of all customer transactions in one place while being organized as well as calculating tax/discounts on specified items for the user. The application was created programmatically, meaning the code was written using Java only.

**Implementation**

The GUI based Grocery billing system was created programmatically (Java only). I attempted to create the GUI using Scene Builder but noticed I was having some issues getting everything to work properly. In my Item class I have created a set of protected variables so that they cannot be accessed outside of the package. Then I proceeded to do the calculations for the few discounted items using If statements. I then used if and else statements to calculate the tax and final total of all added transactions. In my appDemo class I created the GUI for the application including all the events, scenes, table, buttons, text fields, vBoxes, border panes, and labels.

**Software Description**

The GUI for the application is straightforward and easy to use for any user. The opening scene shows the customer table on the right which holds all transactions including the code, type, name, quantity, price, and discount columns. Clicking the login button takes you to a new scene and asks for the user phone number to login. The add button gives the user the option of entering transaction information such as the day, code, quantity, department and more. Once the add button is clicked the information is then moved to the table and a discount is applied to certain items. Clicking the update button takes you to a new scene showing the same input fields as the add button but instead of adding to the table the update button will change the selected transaction information that has already been entered. To properly update something in the table, the user needs to use the correct item code or else this will not work, and an error message will appear on the screen. Clicking the remove button takes the user to a new scene and asks for an item code. If the correct item code is entered and the remove button is clicked, a message will appear on the screen and the transaction will be removed from the table. The print button calculates the final total for each transaction including tax and discounts if applicable.

**Conclusion**

The purpose of this Grocery billing system is its ease of use, simplicity, and functionality for any user. As soon as the application is opened, the user has everything they need to easily add, update, remove, or calculate customer transactions. There is nothing a user must figure out with this application. All the necessary tools are there as soon as the application is running. In the future I would like to use Scene Builder so I can make the GUI more appealing and organized.