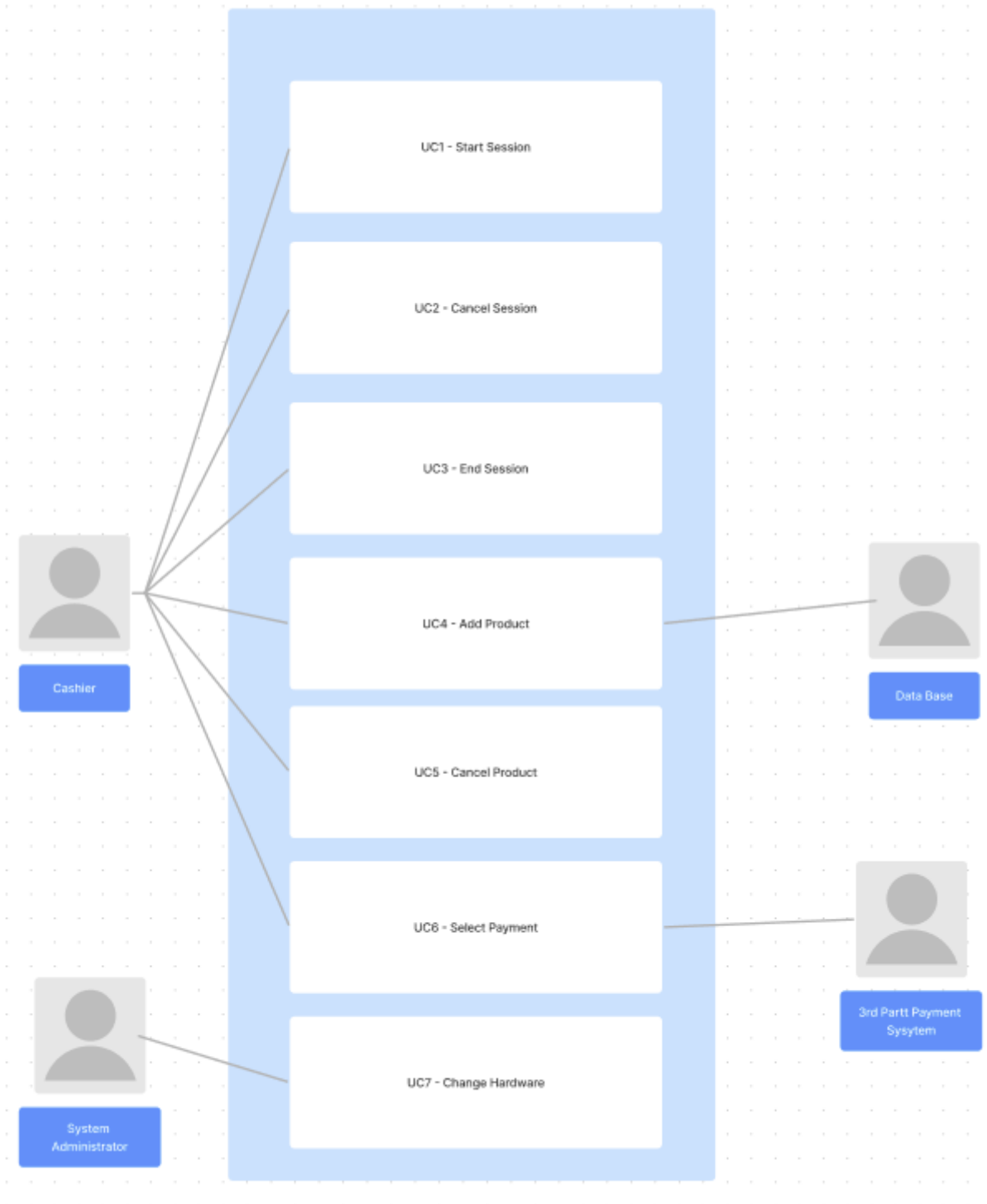
Exercise One

Use Case Model



Description of Use Cases

Use Case	Description
UC-1 - Start Session	A Cashier starts a product purchasing session through the keyboard prior to any products being read by the barcode scanner.
UC-2 - Cancel Session	A Cashier starts a purchasing session at any time during the session resulting in removing all items that have been scanned since the start of the session
UC-3 - End Session	Once a payment session is complete, the Cashier can end the product purchase session and a receipt will be printed including all the product selected, as well as the unit price, quantity and total price.
UC-4 - Add Product	A Cashier adds a product using the scanner or enters the product code on the keyboard. Once the product is added to the session, the name and price of the product will be displayed. If the product entered is unknown, then the message “Unknown product” will be displayed.
UC-5 - Cancel Product	A Cashier can cancel a product at any time during the session by selecting the product cancel button on the keyboard and scanning the product or entering in the barcode.
UC-6 - Select Payment	Once all the products have been added to the session, the Cashier will proceed by selecting one of the payment options on the keyboard: Cash, Credit or Debit.
UC-7 - Change Hardware	The System Administrator changes components of the the hardware platform.

Quality Attribute Scenarios

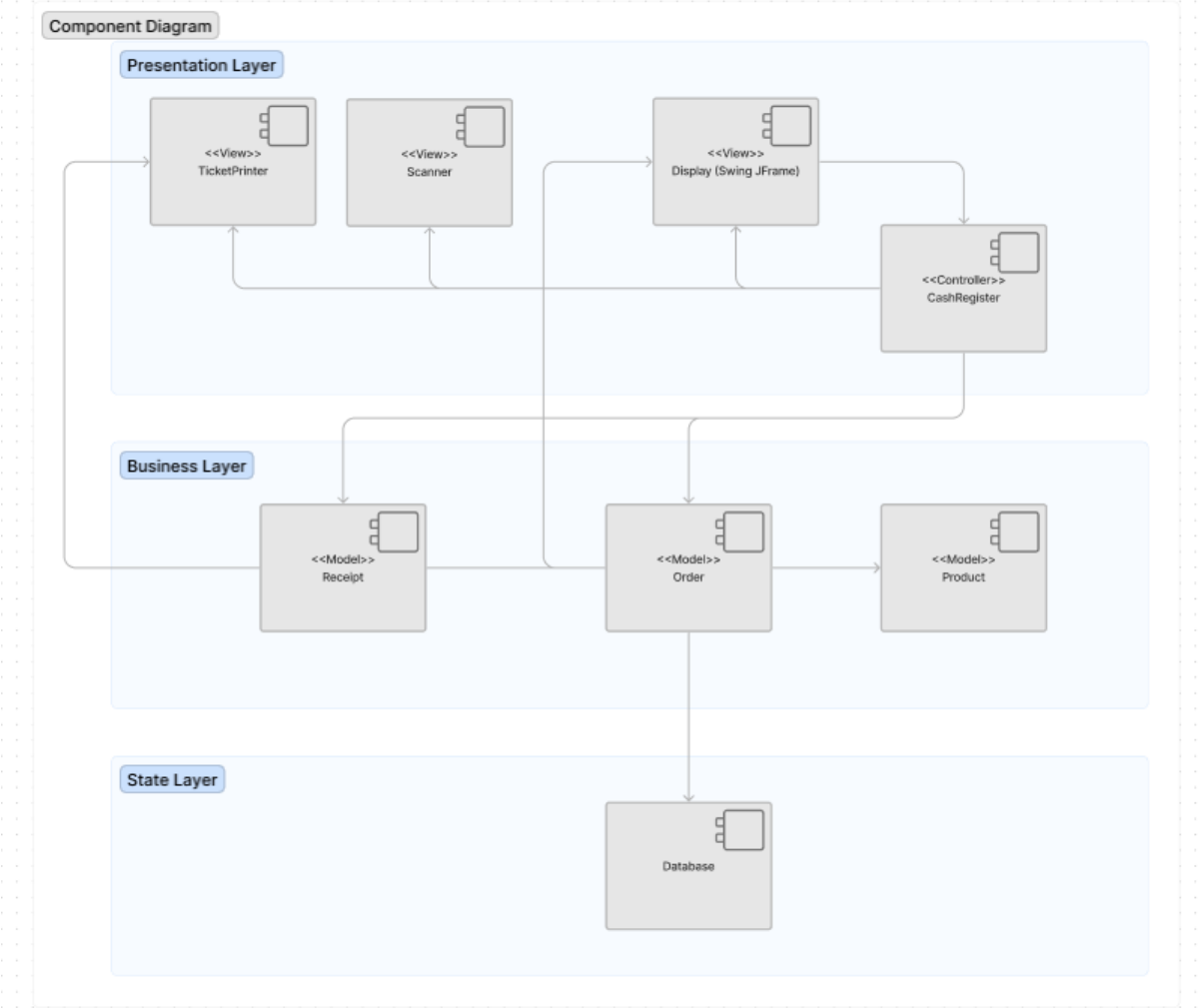
ID	Quality Attribute	Scenario	Associated Use Case
QA-1	Modifiability	It is expected that in the future new hardware components can be added to the hardware platform.	UC7 - Change Hardware
QA-2	Performance	Cash Register should be responsive with queries and load time on average being under 3 seconds	UC-1-2-3-4-5-6
QA-3	Modifiability	Cashier should be able to add and remove items as the session is active.	UC-4-5
QA-4	Availability	Cash Register should be highly reliable	UC-1-2-3-4-5-6
QA-5	Security	3rd party payment system is used to complete Credit and Debit payment	UC-6
QA-6	Modifiability	Cashier should be able to start session, cancel session, and end session	UC-1-2-3

Constraints

ID	Constraint
CON-1	A maximum of 1 Session can be in process at a time, per register
CON-2	A maximum of 1 user can be supported at a time, per register
CON-3	The system requires a connection to one or more MySQL relational DB's for operation
CON-4	A maximum of 5000 products per session can be supported by the system
CON-5	All transactions must be stored in the database
CON-6	The network connection to the registers can have low bandwidth but is generally reliable

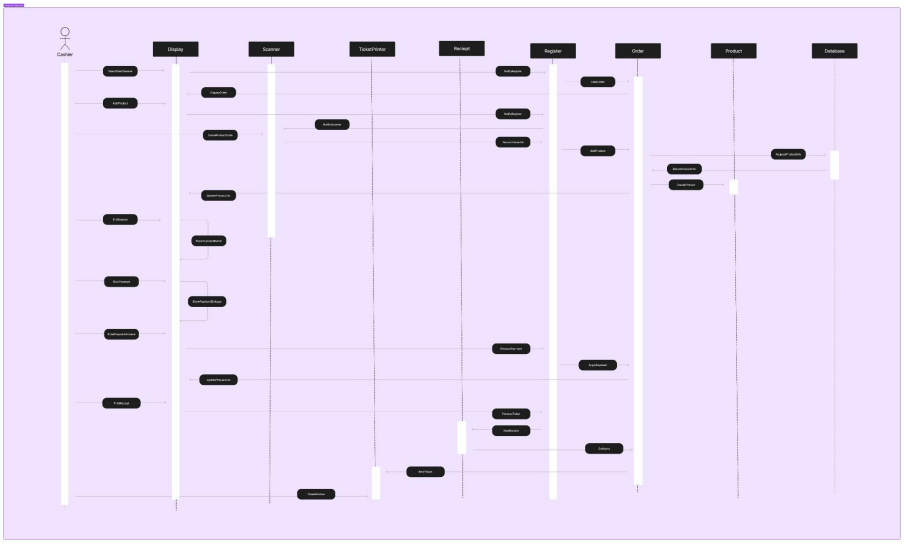
Exercise Two

Component Dependency Diagram



Exercise Three

Sequence Diagram

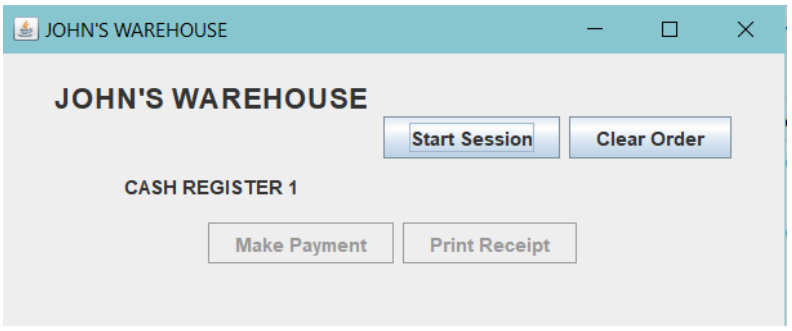


Exercise Four

Program Instructions

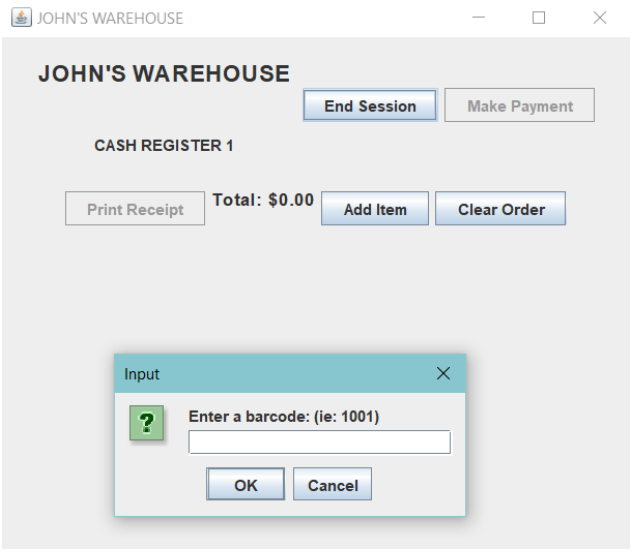
The main class used to execute the program is CashRegister. Running this class will load the display GUI for the cashier to interact with.

CashRegister Display

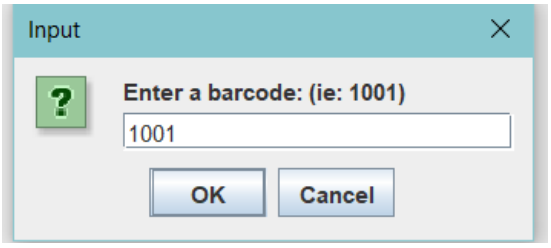


Starting a session allows the cashier to add items to the order using the Scanner class. The cashier presses the “Add Item” button which brings up a separate GUI for inputting the product barcode.

Adding an Item

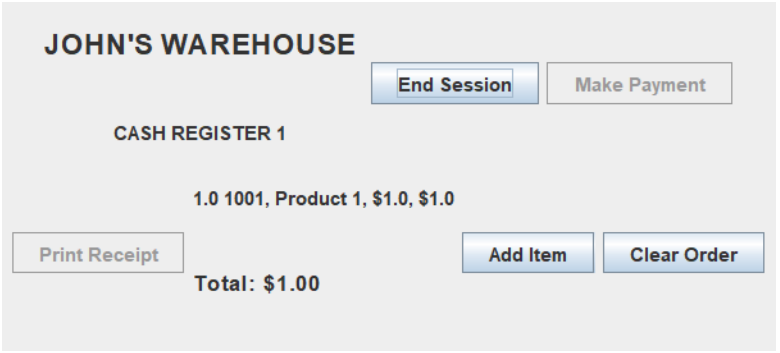


Entering a Barcode

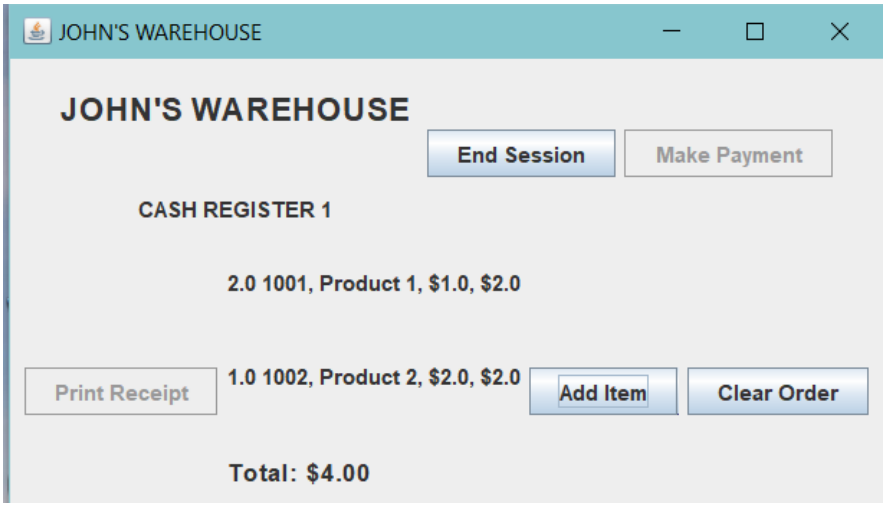


Entering a valid barcode will add the product's quantity, barcode number, name, unit price, and total price per quantity to the display. The order total will also be shown.

Product Added to the Current Order Session

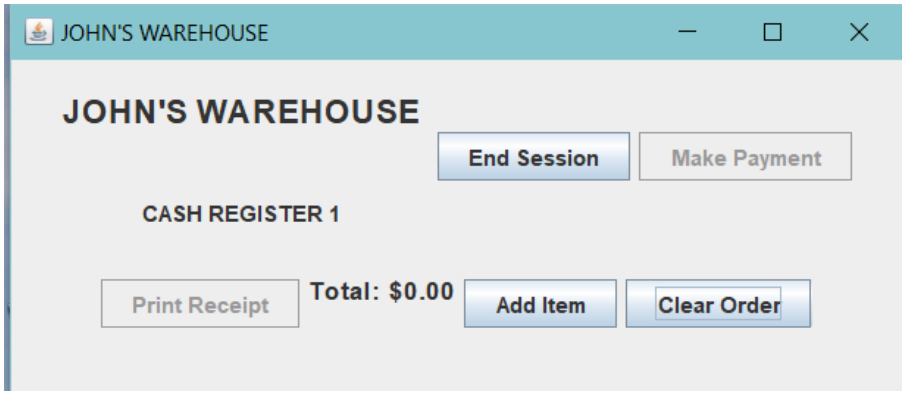


Multiple Products Added to the Current Order Session



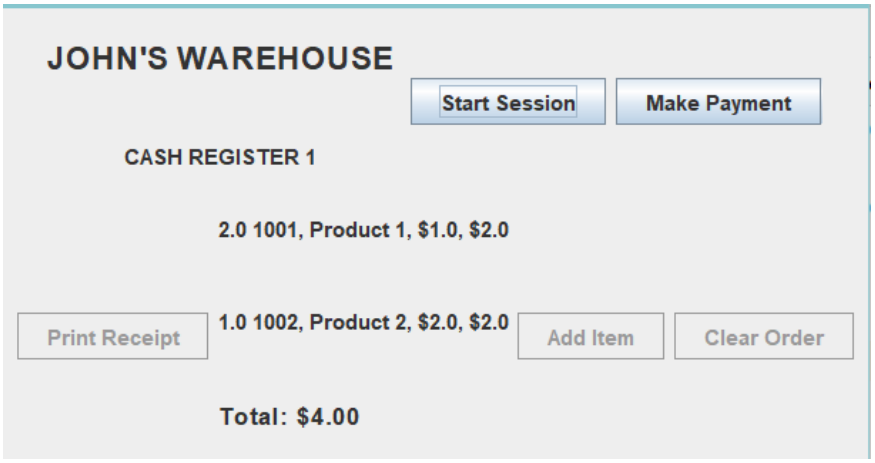
The cashier can also select the “Clear Order” button to clear the current order.

Order Cleared

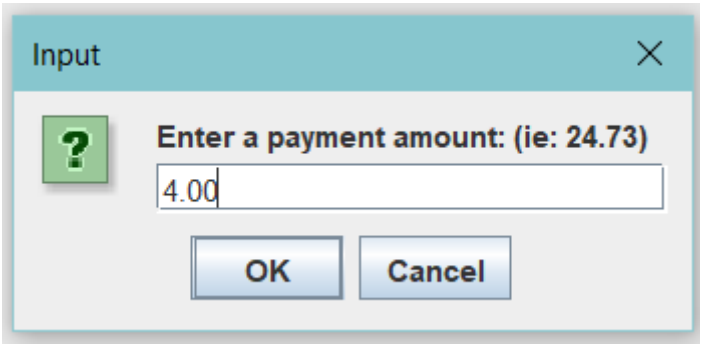


Once all items have been added, the cashier can select the “End Product” button. Now the “Make Payment” button becomes accessible. Selecting this button opens a new GUI for inputting the money paid. For the sake of this program, the cashier can enter a payment less than or equal to the order total.

Session Ended

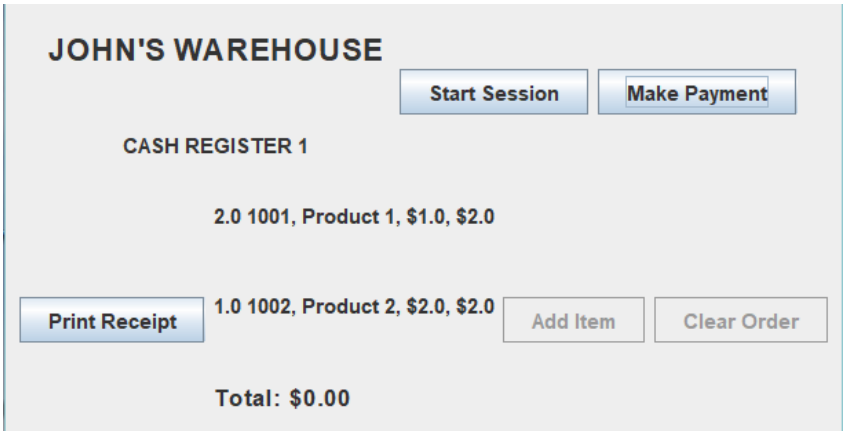


Entering a Payment Amount



After entering a payment, the display is updated to reflect the new total remaining. Finally, the cashier can select the “Print Receipt” button to print a receipt from the Ticket Printer.

Display After Receiving a Payment



Order Receipt