



Faculty of Engineering and Applied Science

SOFE3650

Software Design and Architecture

Assignment 2: Architectural Patterns

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Q1: Identifying Design Drivers

Table 1: Use Cases

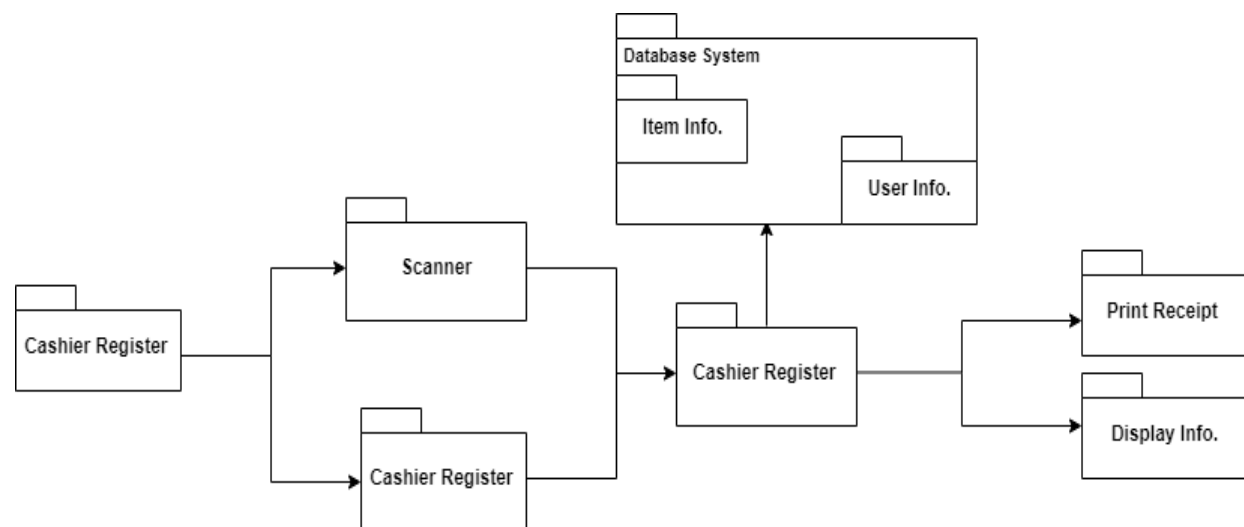
Use Case	Description
UC-1 Reads barcodes scanned by the customer	The cash register should have a scanner that allows the customer to read the barcodes attached to the products selected.
UC-2 Display the name and price of the product	The scanned product should display the names and prices of the products selected by the customer
UC-3 Allow manual user input	The cash register should allow the cashier to input, modify and cancel scanned products and products that are not able to be scanned by the customer.
UC-4 Effective payment options	The cash register should have several payment options for the customer to complete their transaction.
UC-5 Effective transaction calculation	The register should be able to calculate the total cost of the products selected by the user with every other applicable tax and discounts
UC-6 Display Receipt	The register should be effective enough to print out and display a well detailed receipt that contains the name of the products, prices, quantity and so on.

UC-7 Local Database	A local database should be available for the products
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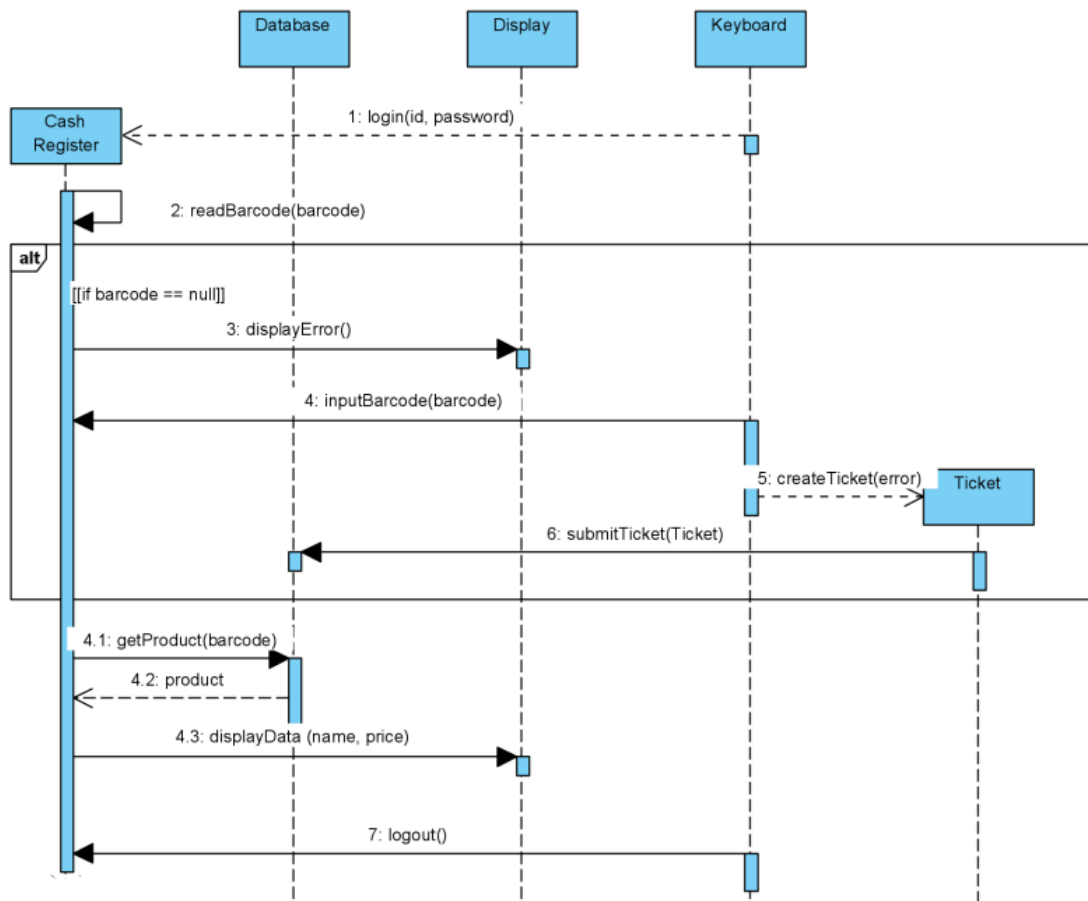
Table 2: Quality Attributes and Constraints

ID	Quality Attribute	Scenario	Associated Use Case	Constraints
QA-1	Performance	Too many products scanned may overload the system and cause the system to crash and must be reset	Reads barcodes scanned by the customer	The database system keeps track of scan history being overwhelmed not being able to hold it in the provided memory
QA-2	Performance	A failure to print out a well detailed receipt	Display Receipt	The printing machine system is facing hardware or systematic malfunctions
QA-3	Availability	A connection problem may arise with the third-party banking system and so customers may not be able to use that specific payment option	Effective payment options	Customers may not have available options on them.

Q2: Component Diagram

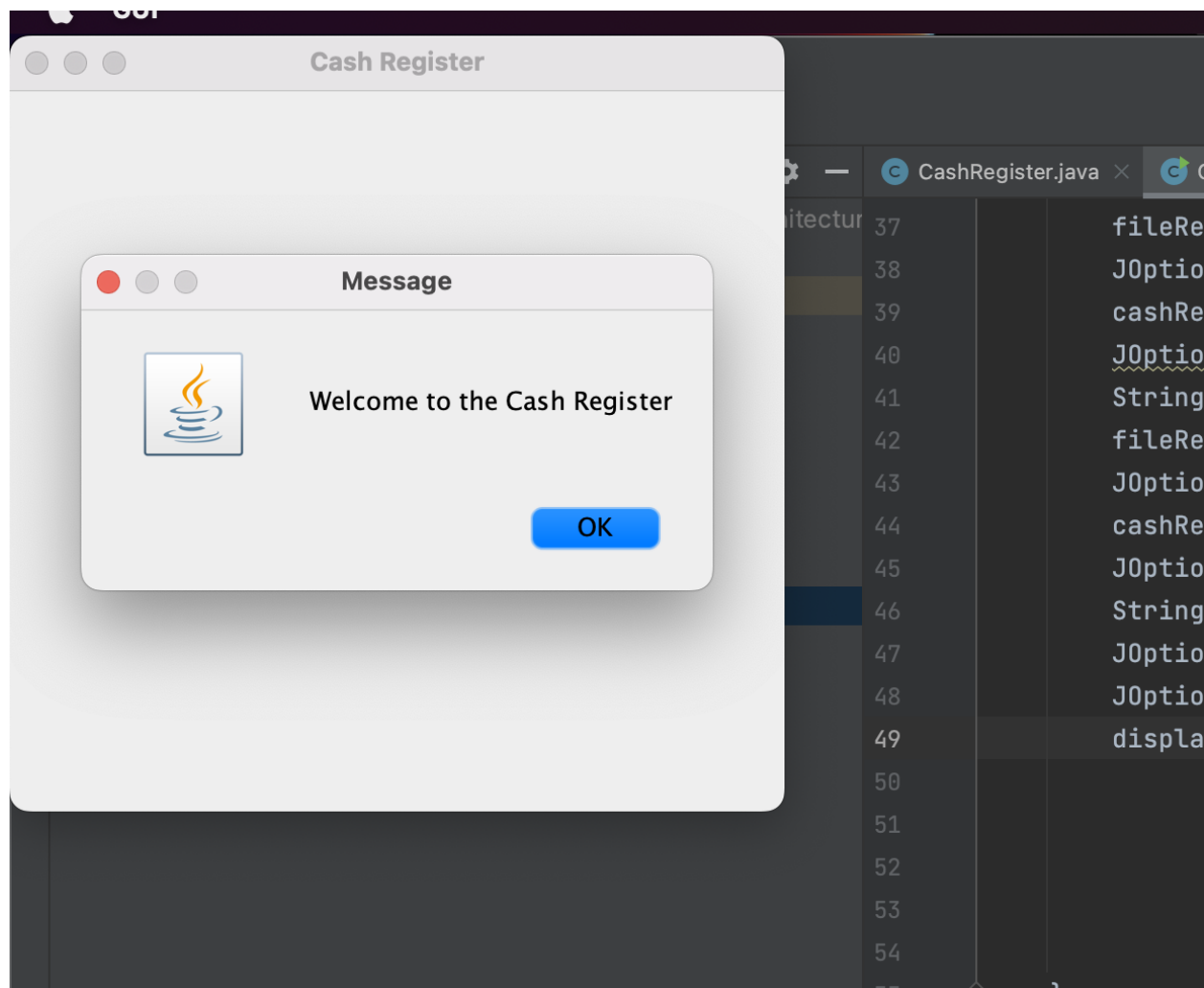


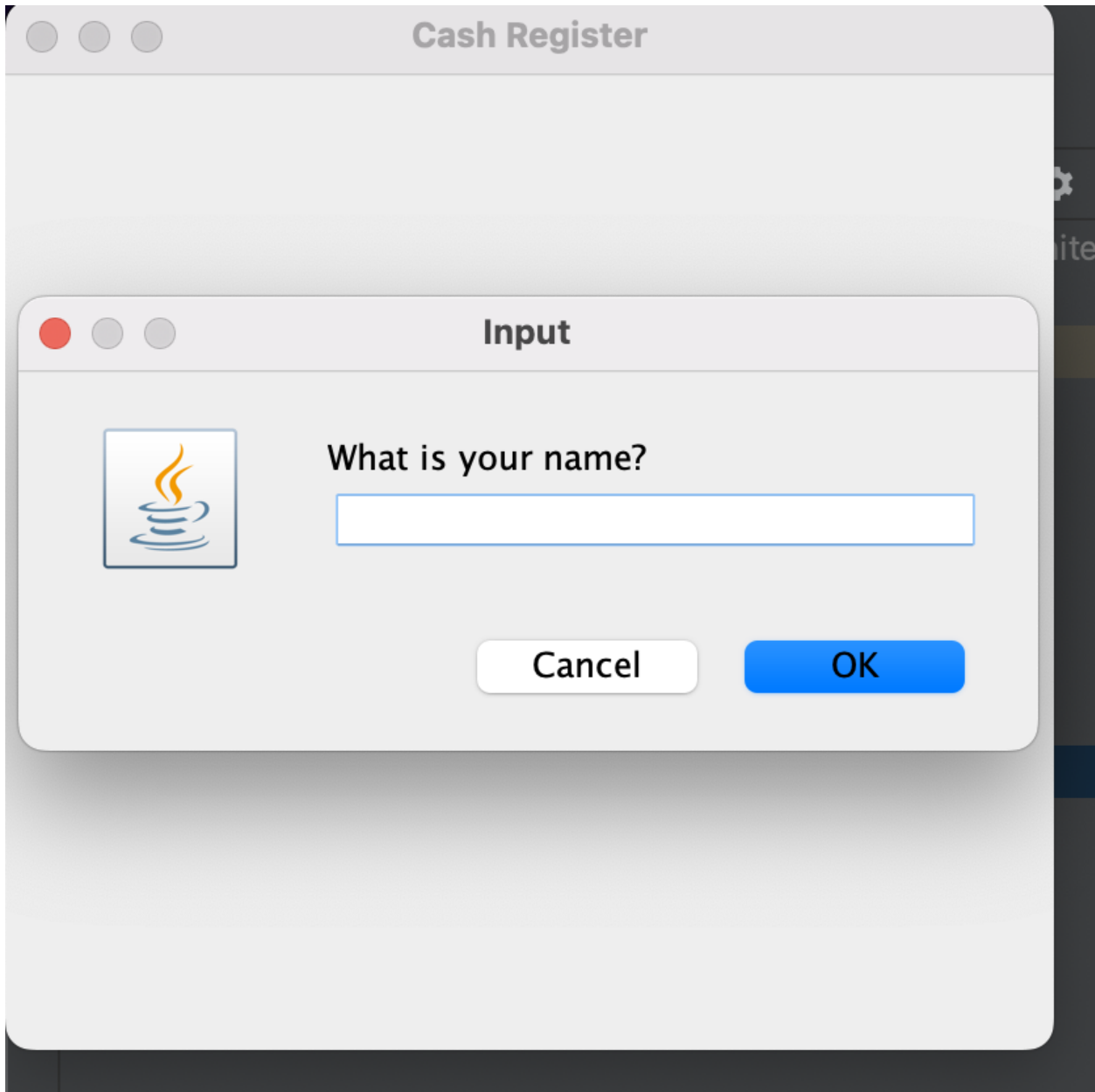
Q3: Sequence Diagram

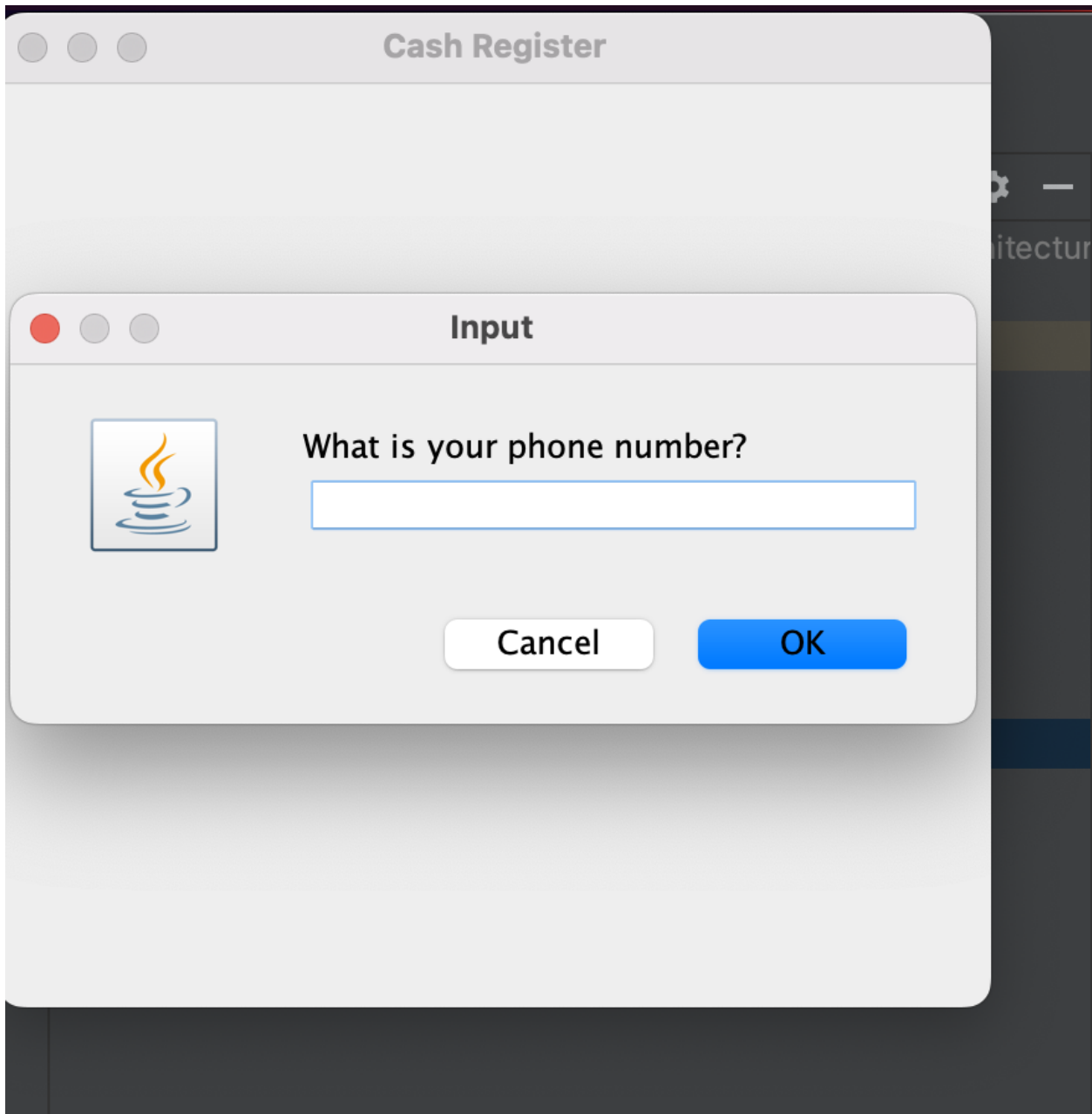


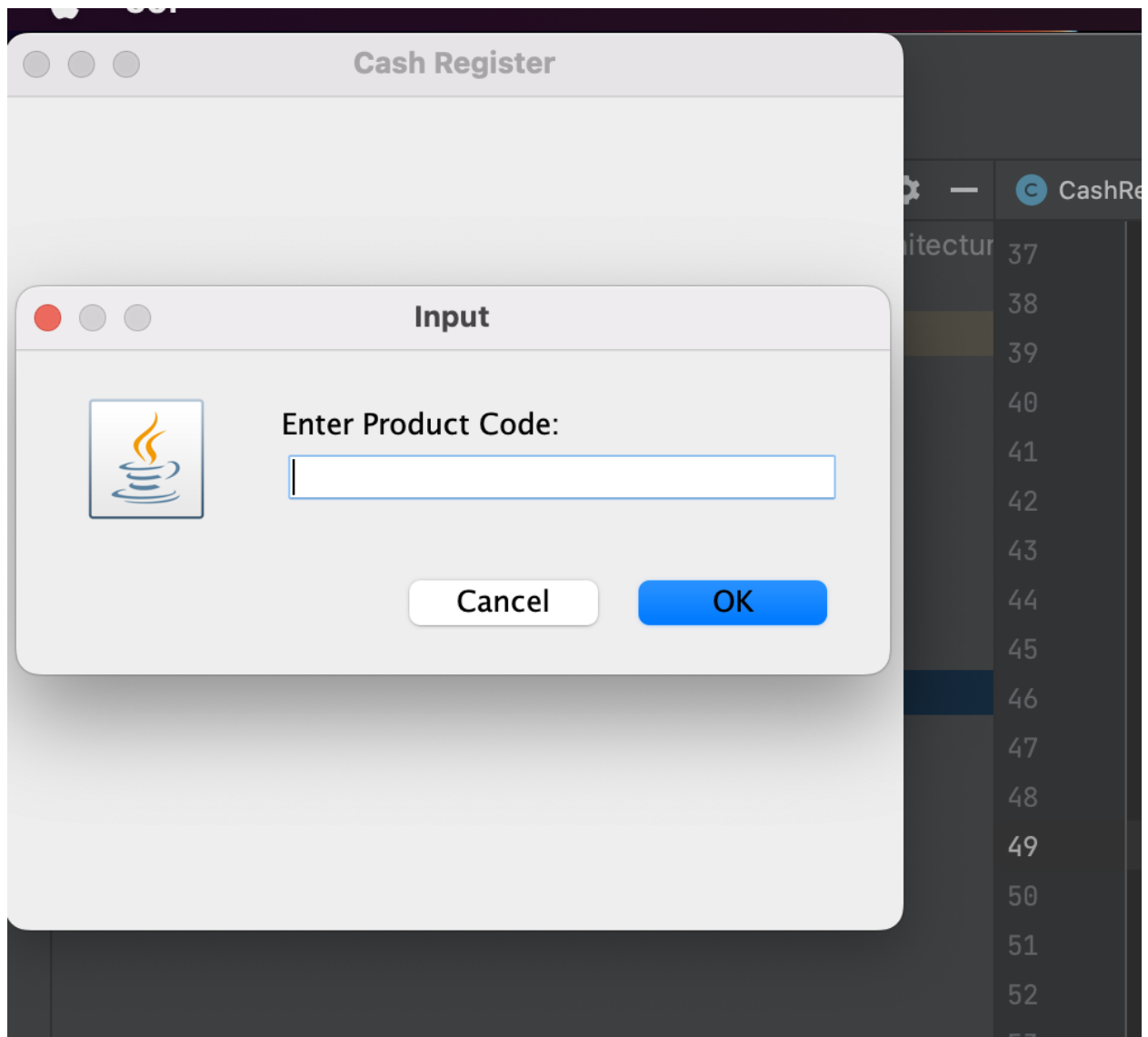
Q4: Implementation

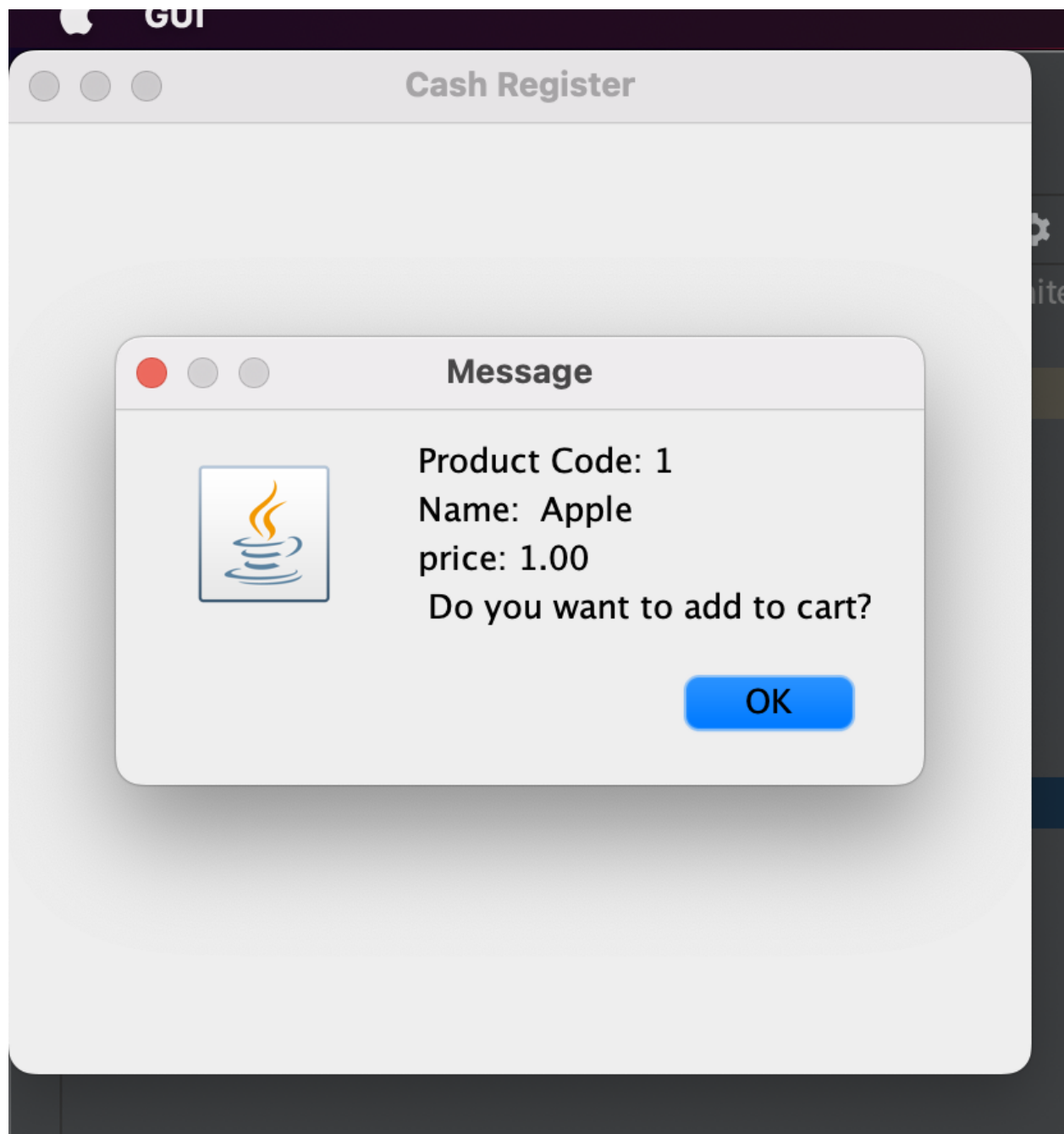
Screenshots of code output:













GUI

Cash Register

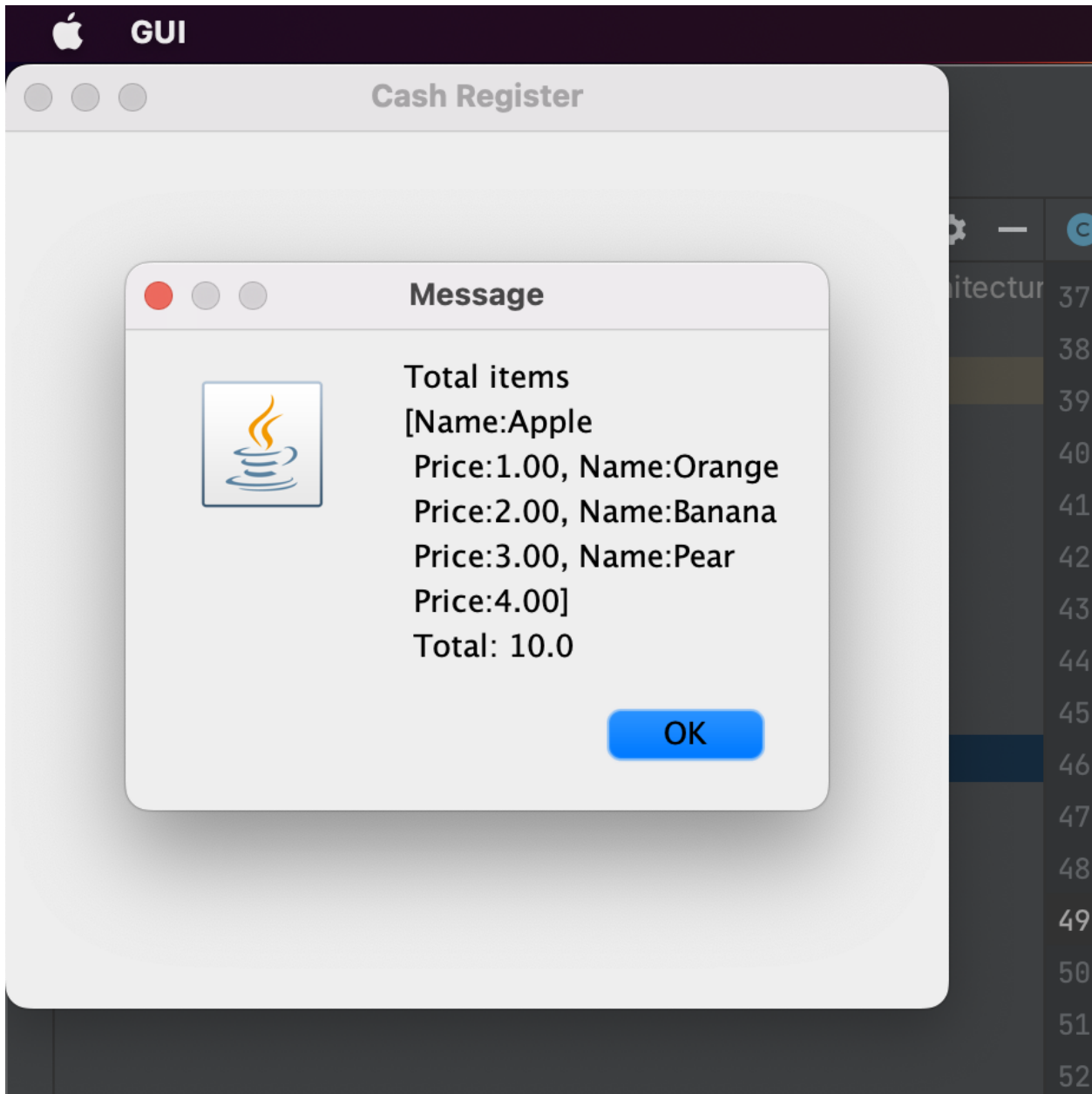


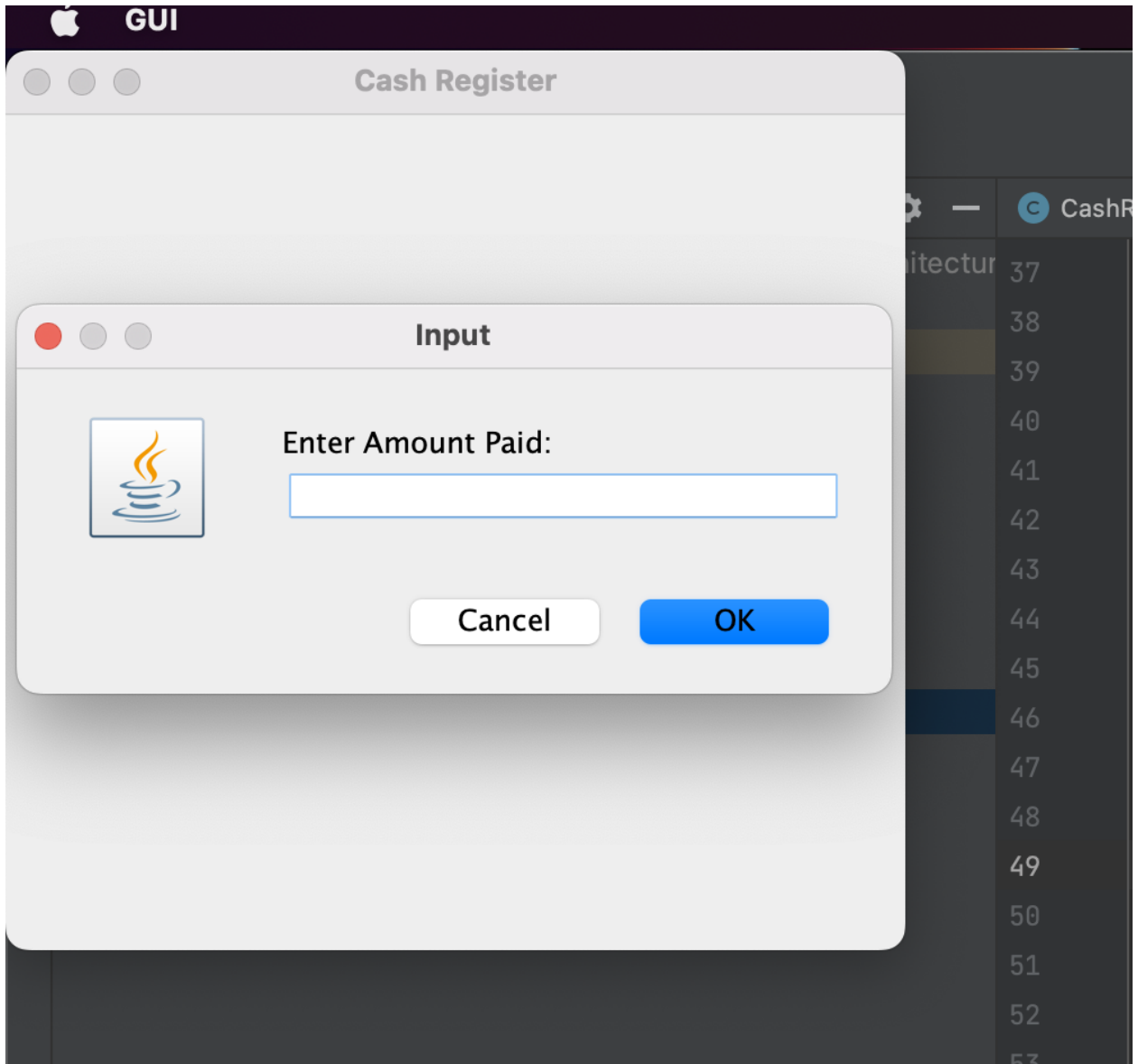
Message



Do you want to add more items to cart?

OK





Cash Register

Message



Receipt[Name:Apple
Price:1.00, Name:Orange
Price:2.00, Name:Banana
Price:3.00, Name:Pear
Price:4.00]
Change: 9
Name: Nabeega
Phone: 9059038646

OK

