School of Science, Computing and Artificial Intelligence
The University of the West Indies, Five Islands

OBJECT ORIENTED PROGRAMMING (COMP2232)

PROJECT 1

Date: November 2, 2025

Deadline for Submission: November 23, 2025, 11:59 P.M.

50 MARKS

**This project is worth 15% of your coursework grade*

Consider a software system which performs inventory management for a retail shop. Items are classified as perishable (such as milk, bread, fruit) or non-perishable (such as electronics and stationery) and are saved in the system as with the following properties:

- Inventory Number
- Name
- Amount in Stock
- Unit Price
- Minimum Stock

Perishable Items further have an expiration date, while non-perishable items save the number of days for the warranty.

The Inventory system must provide services such as adding a new commodity, adding to the stock of a commodity, depleting stock, display item details, alert when a stock is low, alert when a perishable item has expired. The system also allows the user to input sales. Each sale has a date, a randomly generated invoice number, and a list of sale Items for that sale. Each sale item has an inventory number and name, corresponding to one of the commodities in stock, a unit price, a quantity and a total price.

You will provide a GUI-based solution for the inventory system using java awt and swing component. Your system must do the following:

1.) Provide a window with Two Tabs: **[3 Marks]**
    a. Inventory
    b. Sale
2.) The Inventory Tab must: **[16 Marks]**
    a. Show a toolbar along the top of the window, having the options:
        i. Add Item: Adds a mew Commodity to the System
        ii. Delete Item: Deletes a Commodity from the System
        iii. Add Stock (Increases the stock)
        iv. Deplete Stock (decreases the stock)
        v. Save (To save edited stock details)

b. Display a scrollable Items list below the toolbar showing all the items in the system.
c. Display a data panel below the list having fields catering to each data instance of the Item, to include: Inventory Number, Name, Amount in stock, Minimum Stock, Unit Price, Expiry Date and warranty days (expiry data will only be used for perishable items, while warranty days will only be used for non-perishable items).
d. When an item in the list is selected the details of the item should be filled into the fields of the data panel.
e. If the user changes any of these fields and clicks "Save" the Item should be updated. Inventory number and Amount in stock should NOT be editable in this way.
f. If, while an item is selected, the user clicks Add stock or Deplete Stock a box should pop up for the user to enter a number, and the stock should be increased or decreased accordingly.
g. If while an item is selected, the user clicks Delete Item, a confirmation box should appear asking if the user is sure he/she wants to delete the item. If yes the commodity is removed, if no, there is no change.
h. Allow the user to clear the data fields in order to Enter a new Item. When the user clicks Add Item a new commodity is created with the details in the fields. No two commodities should have the same Inventory number or name.

3.) The Sales Tab should: **[12 Marks]**
   a. Provide a panel at the top having
      i. a dropdown list of all items in the system that can be purchased
      ii. A text field for entering quantity.
      iii. An Add button for adding the selected sale item and its quantity.
      iv. A remove button form removing a selected line item
      v. A refresh button to reload the dropdown box if any items have been added, removed or updated.
   b. Display a list of line item sales below the panel. This should show columns: Inventory number, Item name, quantity, Unit Price, Line total. Every time the Add button is clicked the new line is added to the sales list along with its calculated line total.
   c. Display a prominent text field at the bottom of the page to show the running Total of the Sale. Every time a line item is added or removed the Sale total should be automatically updated.
   d. Display a prominent Complete button at the bottom of the page to save the new Sale and clear the sale items list and quantity field.
4.) The system should throw the following checked Exceptions: **[10 Marks]**
   a. NotEnoughStockException when there is not enough stock to successfully complete a deplete operation or a sale operation.
   b. InvalidEntryException when the user enters a negative number for Adding to stock, Depleting Stock, or inputting a sale quantity.
5.) Error Alert dialogs should be shown each time a checked exception occurs. **[5 Marks]**
6.) Warning Dialogs should also be shown if a stock is depleted and: **[4 Marks]**
   a. The item falls below its minimum stock
   b. The item is 5 days or closer to the expiry date.