Analysis

Assignment 3 tasks us to design and develop a Java application that emulates a shopping cart that will take a file input by the user and do operations on the cart depending on what operations the user specified. The program should take the file from args, parse each line as an operation, perform the operation on the cart, printing feedback about each operation along the way, then lastly output a cart receipt/summary then terminate. If a user enters an invalid operation in the file, our program should output an error message, skip the invalid operation, and continue performing operations.

There are 5 different types of operations the user can perform: insert, search, update, delete, print. Insert adds an item to the shopping cart. Search counts the total quantity of items in the user’s cart with the specified name. Update changes the quantity value of the first instance of an item with the specified name. Delete removes all items with the specified name from the user’s cart, returning the total quantity deleted. Print outputs a cart receipt/summary to the standard output screen.

Each item in the cart can be of 3 types (clothing, groceries, or electronics) and each type has its own special features. Clothing has no premium shipping option. Groceries can be perishable or nonperishable; premium shipping is required if perishable. Also, sales tax isn’t applied to groceries. Electronics can be fragile or not, premium shipping is required when fragile, and the electronics must be shipped to a valid state. Certain states don’t apply sales tax on electronics: TX, NM, VA, AZ, and AK.

The design phase needs to include a system-level use case diagram, a UML model, ADT descriptions for every class, a functional block diagram showing calling relationships, and the algorithm for the main driver.

The code itself should also follow the coding style guidelines specified on Canvas, have understandable (and commented) logic, and be efficiently modifiable with encapsulated functionality.

Design

Use Case Diagram:



Main Algorithm Pseudocode:

Get file path from args.

Initialize a new Shopping Cart object

Read file one line at a time. For each line:

Is line empty or just whitespace?

If so:

Do nothing.

If not:

Initialize an Operation object from the line in the file.

If the operation entered is invalid, display the error to the user.

Otherwise, Perform the operation on the shopping cart using performOperation(op)

Display the results of the operation to the user.

After reading all lines from the file, print a cart receipt/summary.

UML Diagram:

