**UNIVERSITY OF CAPE COAST**

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**

**CSC 319: DATA STRUCTURES**

**FIRST SEMESTER 2023**

**GROUP PROJECT**

**DEADLINE DATE: 4th April 2022.**

**PRESENTATION DATE: 7th April 2022.**

In this semester project, students are expected to use the data structures (lists, stacks, arrays, queues, trees, sets, maps, hashmaps, hash tables, and graphs) to implement the application described below. Students are also expected to use appropriate searching and sorting algorithms or techniques to search through the database for specific items and sort some items in alphabetical order.

**Tasks**

Create an inventory management system for a provision store that allows the store owner to add goods, view vendors, view goods, view bills, issued goods and view issued goods, as shown in Figure 1. You are at liberty to include any other functionality in your application for extra points.

Graphical user interface, application

Description automatically generated

**Figure 1: Sample interface for the store inventory management system**

**Item Category**

Here are some of the categories that are useful in the store.

1. **Beverages** – coffee/tea, juice, soda
2. **Bread/Bakery** – sandwich loaves, dinner rolls, tortillas, bagels
3. **Canned/Jarred Goods** – vegetables, spaghetti sauce, ketchup
4. **Dairy** – cheeses, eggs, milk, yoghurt, butter
5. **Dry/Baking Goods** – cereals, flour, sugar, pasta, mixes
6. **Frozen Foods** – waffles, vegetables, individual meals, ice cream
7. **Meat** – lunch meat, poultry, beef, pork
8. **Produce** – fruits, vegetables
9. **Cleaners** – all-purpose, laundry detergent, dishwashing liquid/detergent
10. **Paper Goods** – paper towels, toilet paper, aluminium foil, sandwich bags
11. **Personal Care** – shampoo, soap, hand soap, shaving cream

**You should add more items in each category. The above is just a sample.**

**Data structure implementation**

1. Implement stacks when adding and removing items in categories 1 to 4.

2. Implement queues when adding and removing items in categories 5 to 7.

3. Implement lists when adding and removing items in categories 8 to 11.

4. You can use iterators, recursion, stack and queue implementations of the list and other techniques to best for the issued goods and viewing goods and bills.

5. Use maps to keep track of product sales (note, each time a product is sold, its product code should be entered into a sales file)

6. Use HashMaps to store information about the vendors

**Other Requirements**

1. Maintain the balance between too high and too low stock

2. Generate reports to show how the data structure implementation

3. Generate or view reports shown in Figure 1.

4. Creativity will attract extra marks

5. Implement searching and sorting algorithms on items in categories 6 to 11

6. Analyze and report on the performance of your algorithm using Big O Notation

**Rate the group members**

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| **Name** | **Activities** | **%Contribution** |
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**NOTE**

Implement in Java

Design a nice UI

Use MySQL or MSSQL as the database. Connecting to Microsoft Access is not suitable for this project.