**A Simple Point-of-Sale (POS) System**

**1. OBJECTIVE**

The objective of this assignment is to get you familiar with all (mostly) Java basics and some advance concepts, which include the syntax, Java input/output, arrays, lists, classes, objects, inheritance and interfaces utilizing polymorphism. After performing this assignment, you should be able to master these Java concepts. You need to use Eclipse for this assignment.

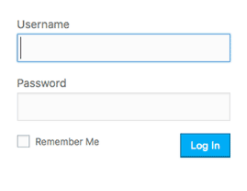
**2. TASK**

In this assignment, the overall task is to develop an application that records sales and

handle payments as in a retail store.  Study the **POS Project Requirements** below. You are recommended to use a GUI for your application; it could be web if you like. Your team will come up with a UX design for your product.

In this POS system, a cashier will be asked to log in the system using his/her user id and password. (There are no limits on the maximum tries of incorrect passwords or users). The system logs in the cashier if proper credentials are provided otherwise a message is displayed to reenter the credentials. (If the user id or password is wrong, the cashier will be asked to re-enter as follows).

Welcome to the Point-Of-Sale Registration System



Please enter your user name: alinaqvi

Please enter your password: thisismypassword

**POS Project Requirements**

Point of Sale System is developed to support supermarket-type store operations. In particular software shall:

Authentication:

**UI**

* 1. Allow the cashier to start a new sale and allow add/remove items to a new sale.
* **UI, backend,** 
  1. Once all items are added to the sale the cashier will request for cash to finalize the sale.

**UI, backend**

* 1. The system will keep track of the amount of sales ($) at each register for each cashier. (This can be managed if you have unique identifiers assigned to each cashier)
* **Backend**
  1. Registers will record the register number, the user (cashier), the dates and times of sale, sale items, and the amount of sales.
* **UI (enter register id, item id and qty (should be 1 or more)), backend.**
* **Validate item and available quantity (rename to onhands). Allow only what we can sell.** 
  1. For returns - Support cancellation of the entire sale as well as return of an individual item.
* UI (saleid, register id, item id, qty(1+). Backend: Just update the quantity and refund amount.
  1. Keep track of the inventory, including quantity, price, supplier, and outstanding backroom inventory orders.

Example of inventory: subtract number of items sold from the master file which should contain items on hand.

**Item to supplier 1 to 1. 1 supplier to many items.**

* 1. Support inventory management (add/remove item to/from inventory, setting threshold for re-ordering. Threshold is when the system should signal the management to order a product if on hand count goes below the threshold.)

**Order to supplier when threshold reached on each sale.**

**Rename outstanding to pending.**

**One more field for re-order quantity**

* 1. Support report generation:
* Inventory report (listing off al inventory items with name, quantity, threshold, supplier, and quantity of items in pending orders. Pending orders mean – the order has been placed however the items have not been received as yet to be put on the shelves or backroom)

**UI**

* Cashier report (X and Z reading: X reading-All sales activities pertaining to a particular cashier for a particular shift, Z reading-All aggregated sales activities pertaining to a All cashier for all shifts in a day)

**UI**

1) First design the system and use UML. -

2) Then divide up the work between team members

3) Make sure you wrote algorithms before you start coding.

4) Write Tests

5) Complete coding.

**Add tax.  
Use file system (no database).  
No coupons no discounts  
No credit cards  
No rest API expected.**

**TODO:**Java docs  
UML diagram

1. Log in: invalid sales id/password on POS system

Echo: Invalid userid and password combination..please re-enter credentials!!!

1. during sale: Invalid item id on POS system., invalid register

FIXED

no invalid register reminder! The register id should be in a range like 01-10, because the register is limited. However, when input 99999 it still works.

1. Options output twice after logging in.

FIXED

1. During adding item into inventory

when the price/quantity/tax.... format is not numeric, like input string by mistake, java.lang.NumberFormatException: comes out. Didn’t catch the exception.

**Nice to have**

1. During deleting items

when item id is invalided in inventory, after deleting item, no reminder comes out. Should reminder cashier no this item id in inventory.

**Nice to have**

1. No item id found during sale. Enter 9999 item id or do not allow to add?

Echo: Item: 999 does not exist...Please enter valid item

It works great but reminder pops out after input the id and quantity. I think the reminder shows after input id is better, no need to input the quantity any more.

1. During sale:

* When operation “press X to finalize POS or C to enter next item id”

If input other string not x, the sale restart, the current sale item info has waved. And restart to sale. Can we add reminder to tell the cashier, “input X or C” and continue to execute the sale processing?

**Nice to have**

* When the item quantity less than the threshold, no reminder appears

**Not an issue. System will order inventory after reaching threshold. Pending column will indicate reorder happened**

* Need to tell the cashier to trigger the reorder from supplier, like “the item is out of stock or less than threshold, how many quantities do you want to order?”

**Cashier should not know re-order. Not an issue. System will order inventory after reaching threshold. Pending column will indicate reorder happened**

1. during return:

* validate if sales id is valid, qty is less or equal to sold item qty, avoid

Echo “return id: 8f19c19b sales id: Xcashier id: sun04877 shift: DAY level: 1 Register: 1 refund amt: 0.0 refund tax: 0.0 total refund amt: 0.0 return time:”

Sales id is X? FIXED

the refund amt repeat

refund total is not valid

* return twice (return same sale id repeatedly)

Echo” item-3 aggregated return quantity 8 is higher than sales quantity 4 please re-enter transaction. Thanks..return transaction is done..”

output “This order has returned at XXX (time)” is better.

* Input item which is not in the sale transaction

Echo “Item:5 is not associated with sales: bbfac978 Please re-enter transaction

Thanks..return transaction is done..”

The reminder appears immediately after typing the wrong item id, no need to input price anymore.

**Fixed. Need to re-validate.**

1. Add some welcome header, store name, etc  
   **Fix sonalint issues**

**TODO**:

* 1. Junit testing
  2. Validate report X issue.
  3. Validation of entire system
  4. Have around 40 items in inventory
  5. Fix sales exception (validation pending)
  6. UI integration