Clothing Store Point of Sale System

Team Members
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System Description

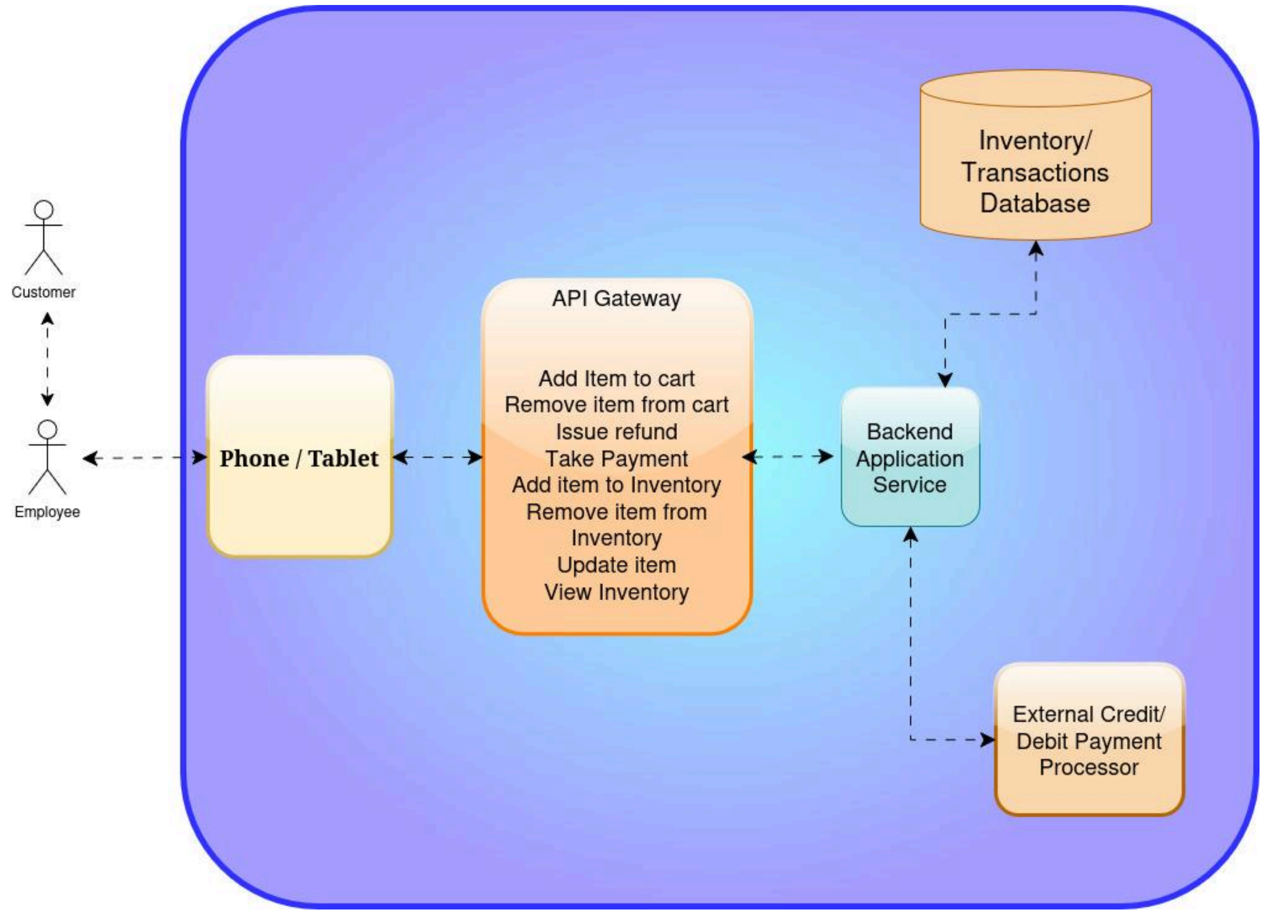
This POS system streamlines sales and inventory management for employees. It supports purchases, returns, and integrates with external processors for credit/debit card payments. Transactions can be completed using cash, card, or barcode scanning/manual entry of item IDs.

Key features include:

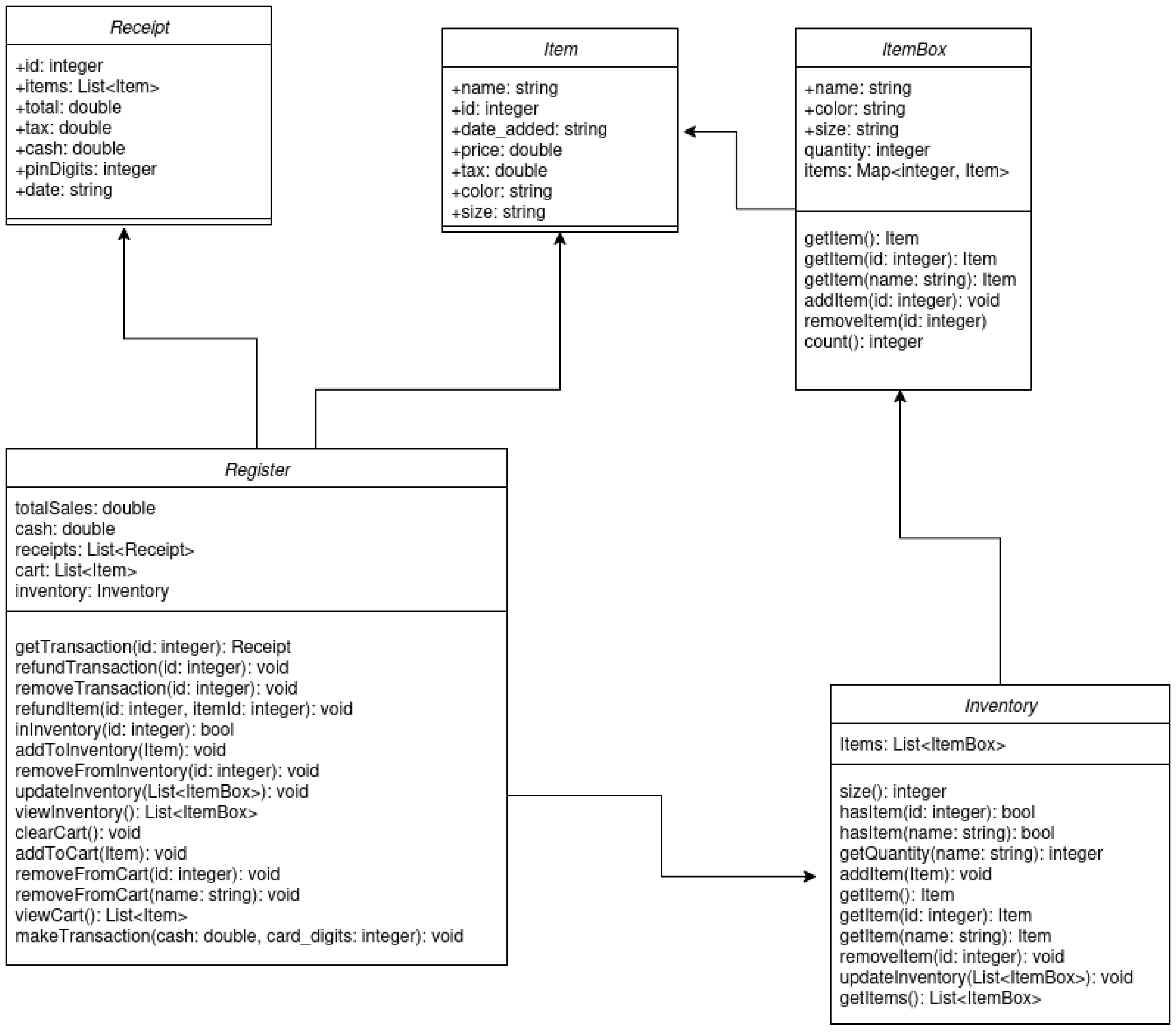
- Automatic calculation of totals with sales tax.
- Real-time inventory updates after sales or refunds.
- Refunds are issued in cash only.
- Employees can search inventory by item ID, name, or date added.
- Staff can add items with details like price, quantity, size, color, and ID.
- Data is stored securely in a cloud-synced database, accessible across store locations.
- Transaction history is securely stored and accessible only to administrators.
- The system works on iOS and Android phones or tablets with internet access and camera barcode scanning.

Software Architecture Overview

- Architectural diagram of all major components



- UML Class Diagram



Receipt
+id: integer
+items: List<Item>
+total: double
+tax: double
+cash: double
+pinDigits: integer
+date: string
Item
+name: string
+id: integer
+date_added: string
+price: double
+tax: double
+color: string
+size: string
ItemBox
+name: string
+color: string
+size: string
quantity: integer
items: Map<integer, Item>
getItem(): Item
getItem(id: integer): Item
getItem(name: string): Item
addItem(id: integer): void
removeItem(id: integer)
count(): integer
Register
totalSales: double
cash: double
receipts: List<Receipt>
cart: List<Item>
inventory: Inventory
getTransaction(id: integer): Receipt
refundTransaction(id: integer): void
removeTransaction(id: integer): void
refundItem(id: integer, itemId: integer): void
inInventory(id: integer): bool
addToInventory(Item): void
removeFromInventory(id: integer): void
updateInventory(List<ItemBox>): void
viewInventory(): List<ItemBox>
clearCart(): void
addToCart(Item): void
removeFromCart(id: integer): void
removeFromCart(name: string): void
viewCart(): List<Item>
makeTransaction(cash: double, card_digits: integer): void
Inventory
Items: List<ItemBox>
size(): integer
hasItem(id: integer): bool
hasItem(name: string): bool
getQuantity(name: string): integer
addItem(Item): void
getItem(): Item
getItem(id: integer): Item
getItem(name: string): Item
removeItem(id: integer): void
updateInventory(List<ItemBox>): void
getItems(): List<ItemBox>

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Receipt

Description:
Represents a completed transaction. Each receipt contains information about purchased items, payment details, and the date of the sale.

Attributes:

- `id: integer` — Unique identifier for the receipt.
- `items: List<Item>` — Collection of all items purchased in the transaction.
- `total: double` — Total cost including tax.
- `tax: double` — Total tax applied to the transaction.
- `cash: double` — Amount of cash paid by the customer (0 if card only).
- `pinDigits: integer` — Last few digits of the card number used for payment (0 if cash only).
- `date: string` — Date and time when the transaction occurred.

Operations:
(No explicit methods defined for this class; data container for Register operations.)

Item

Description:
Represents a single product in the store with its identifying details and pricing information.

Attributes:

- `name: string` — Name of the item.
- `id: integer` — Unique identifier for the item.

- `date_added: string` — Date when the item was added to the inventory.
- `price: double` — Price of one unit before tax.
- `tax: double` — Tax amount applied to a single unit.
- `color: string` — Color of the item.
- `size: string` — Size of the item.

Operations:
(No explicit methods defined for this class; serves as a data model for inventory and receipts.)

ItemBox

Description:
Stores a group of identical or related items (same name, color, and size). Tracks the quantity of each item variant and allows lookups and modifications.

Attributes:

- `name: string` — Name of the item type.
- `color: string` — Color of the variant.
- `size: string` — Size of the variant.
- `quantity: integer` — Number of items available.
- `items: Map<integer, Item>` — Map of item IDs to their corresponding `Item` objects.

Operations:

- `getItem(): Item` — Returns one available `Item` from the box.
- `getItem(id: integer): Item` — Returns the `Item` with the specified ID.
- `getItem(name: string): Item` — Returns an `Item` matching the given name.
- `addItem(id: integer): void` — Adds an `Item` with the given ID to the box and increases quantity.
- `removeItem(id: integer): void` — Removes the `Item` with the given ID and decreases quantity.
- `count(): integer` — Returns the current number of items in the box.

Inventory

Description:
Represents the store's entire stock of items. Contains multiple `ItemBox` objects and provides methods to search, add, remove, and update inventory data.

Attributes:

- `items: List<ItemBox>` — List of all item boxes currently in stock.

Operations:

- `size(): integer` — Returns the total number of `ItemBox` entries in inventory.
- `hasItem(id: integer): bool` — Checks if an item with the given ID exists in stock.
- `hasItem(name: string): bool` — Checks if an item with the given name exists in stock.

- `getQuantity(name: string): integer` — Returns the quantity of all items with the given name.
- `addItem(item: Item): void` — Adds an item to the appropriate `ItemBox`, creating a new one if needed.
- `getItem(): Item` — Returns an arbitrary or available `Item` from inventory.
- `getItem(id: integer): Item` — Returns the `Item` with the specified ID.
- `getItem(name: string): Item` — Returns an `Item` matching the specified name.
- `removeItem(id: integer): void` — Removes the `Item` with the specified ID from stock.
- `updateInventory(list: List<ItemBox>): void` — Updates or replaces the inventory with the provided list.
- `getItems(): List<ItemBox>` — Returns all `ItemBox` objects currently in inventory.

Register

Description:
Handles all sales operations, including managing the shopping cart, processing payments, handling refunds, and recording receipts.

Attributes:

- `totalSales: double` — Total revenue accumulated from all transactions.
- `cash: double` — Amount of cash currently available in the register.
- `receipts: List<Receipt>` — All completed transaction receipts.

- `cart: List<Item>` — Items currently being purchased in an ongoing transaction.
- `inventory: Inventory` — Reference to the store's inventory used for item operations.

Operations:

- `getTransaction(id: integer): Receipt` — Retrieves a receipt with the given ID.
- `refundTransaction(id: integer): void` — Issues a full refund for a transaction by ID and restores the inventory.
- `removeTransaction(id: integer): void` — Removes a transaction record from the system without processing a refund.
- `refundItem(id: integer): void` — Refunds a specific item by ID and restores it to inventory.
- `addItemToInventory(item: Item): void` — Adds a single item to inventory.
- `updateInventory(list: List<ItemBox>): void` — Updates inventory in bulk with the provided item boxes.
- `viewInventory(): List<ItemBox>` — Returns the current state of inventory.
- `clearCart(): void` — Empties all items currently in the shopping cart.
- `addToCart(item: Item): void` — Adds a specific item to the cart.
- `removeFromCart(id: integer): void` — Removes an item from the cart by ID.

- `removeFromCart(name: string): void` — Removes an item from the cart by name.
- `viewCart(): List<Item>` — Returns all items currently in the shopping cart.
- `makeTransaction(cash: double, card_digits: integer): void` — Completes a sale, generates a new receipt, updates total sales, adjusts cash balance, and clears the cart.

Team Member Tasks/Responsibilities

Drew Miller

- Partitioning members tasks, Architectural Diagram, UML Class Diagram

Caleb Thai

- System Description, Architectural Diagram

Jason Kao

- System Description, Architectural Diagram

Nathan Tran

- System Description, Architectural Diagram

Adarsh Shresth

- UML Class Diagram, Descriptions

Parleen Bagga

- UML Class Diagram, Descriptions