3rd Software Engineering Group Project

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Project Name:
Self Service Checkout.

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Introduction:

With the number of Embedded Systems increasing greatly over the past few years, their use by the public on a day to day basis is also increasing. One of the areas in which is most visible to the public is their usage in the retail industry. An prime example of such a system, is that of the self-service checkout. Using this system an individual can enter a store, collect the items needed, then proceed to a checkout where they themselves will perform the majority of transactions usually performed by the cashier (scanning of items, placing them in bags and handling the monetary transactions.)

A large number of supermarket retailers employ some form of this system, especially for customers wishing to purchase a small number of items. This allows for a greater number of transactions to take over a shorter period of time and allows the company to employ less staff.

Overview:

Following a number of team meetings, we have decided to build a representation of a functional self-service checkout. This system will allow a customer/user to perform a transaction as if they were at an in-store self service checkout. The user will interact with the system to perform all the necessary functions required to complete their transactions. They will begin by placing their items on a USB weighing scales which will take the initial weight of their combined purchases. They will then proceed to scan items into the system using a USB barcode reader, and place the scanned items on a second USB weighing scales, which upon completion of the item scanning will take a weight of the combined purchases and compare this with the initial weight in order to verify that all items were scanned. As a further implementation of fraud protection, each items weight will be listed such that the total weight of all items scanned must equal the initially calculated weight as well as the weight just before payment. The user can then complete the transaction by selecting an option to pay for goods.

The interface to the system will be run through a laptop or PC, here all data generated by the transaction will be processed. The system will communicate with a MySQL database which will hold item data (item name, barcode, weight, price). An item can be retrieved from the database using its barcode to retrieve the necessary item data.

A benefit of using a database for item data storage is that it allows items to be added, removed and adjusted with relative ease. It also allows for items to be stored in a convenient fashion, with a number of base attributes to be assigned to a particular item. It also allows items to be grouped by a particular attribute which can be used to implement "promotions" and other such offers.

Requirements:

This project must:

- Provide a realistic representation of a self-service checkout as descibed above.
- Contain a simple, yet functional graphical interface for customer usage to provide information such as items purchased, total price and buttons to select options such as, call for assistance, complete purchase and pay.

Secondary goals of this project might include:

- The introduction of barcoded coupons such that a customer can scan a coupon and have the value of the coupon reduced from their total price.
- Implement a customer database such that frequent customers are provided with discounts on selected items.

This project will not:

- Produce recommendations for customers.
- Produce receipts.

Technology/Hardware Requirements:

PC/Laptop, 2x USB Weighing Scales, 1xUSB barcode reader, Java, MySQL.

Project Roles:

GUI Developer – To provide the customer with an interface to the system, allowing them to view prices and select various options such as payment, use of coupons.

Hardware Developer – To allow the system to communicate with its attached devices and present their output in an acceptable format such that all data is easily available.

Database Developer – To provide the system with an interface to the item database, also tasked with managing the database to ensure correctness of internal data.

System Developer – To provide the core methods used within the system, calculation of total prices, obtaining data from other parts of the system to implement methods central to the system.