**Capstone Database High Design: RFID Shopping**

**Purpose:**

The database supports the RFID Shopping application. The system allows customers to log in their accounts by RFID cards and passwords. Then customers are able to purchase products by themselves. Moreover, the application provides the functions, including what a list of products, prices, and total price which are token by a customer. What are ingredients of each product? What receipt history look like?

The application has the following screens:

* A portal for login customer account and supplies forget password function.
* Web page which allows users to reset passwords. The entry will send to users by their email.
* A dashboard for users to decide the functions, look up history, purchase groceries, and sign out.
* A screen to show a list of products, quantities, prices and total cost which customers want to purchase.
* A page for showing a product information including name, price, category. If it’s a food, then shows nutrition facts, and ingredients.
* Administrator page. The page which only allows highest privilege users to access, and the administrator can add, modify, and remove accounts.

**Technologies:**

The application uses RFID, desktop app and database technologies:

* Python 3.7
* Java SE 11
* MySQL 8.0.13
* RFID Reader
* RFID tag/card
* HTML 5
* Javascript ES6
* PHP 7.3

**Database:**

The data is stored in a MySQL database.

**Primary tables:**

* Customer
* Receipts
* Products
* NutritionFacts

**Lookup/Support tables**

* Categories
* Ways\_to\_pay

**Linking Tables**

* Customers\_to\_Receipts
* Receipts\_to\_Products

**Table Definitions:**

**Customers**

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Description | Notes |
| Customer\_Id | INT | Auto Incremented Primary Key | Primary Key; Auto Increment, Unique, Non Null |
| RFID\_ID | VARCHAR(45) | RFID ID | Non Null; Unique; |
| Password | VARBINARY(255) | Password (Encryption) | Non Null; Default ‘0000’(Before encode) |
| E\_mail | VARCHAR(128) | e-mail of customers | Nullable |
| phone\_number | VARCHAR(45) | Phone number of customers | Nullable |

**Receipts**

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Description | Notes |
| Receipt\_Id | INT | Auto Incremented Primary Key | Primary Key; Auto Increment, Unique; Non Null; Default 0 |
| Customer\_Id | INT | Customer Id from Customer table | Foreign Key join to Customer table; Non Null; Default 0 |
| sum\_of\_price | DECIMAL(9,2) | The balance needs to pay. | Non Null; Default 0.0 |
| payment\_way\_Id | INT | Payment way from Ways\_to\_pay table | Foreign Key join to Payment way table; Default 0 |
| date | DATE | A date when a receipt generated | Nullable |

**Products**

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Description | Notes |
| Product\_Id | INT | Auto Incremented Primary Key | Primary Key; Auto Increment, Unique, Non Null |
| product\_name | VARCHAR(128) | Product name | Non Null; Unique; Default concat( 'TBD' ,UUID()) |
| price | DECIMAL(9,2) | Product price | Non Null ; Default 0.00 |
| Ingredients | VARCHAR(1024) | Product ingredients | Nullable; |
| Category\_Id | INT | Category from categories table | Foreign Key join to categories table;Default 1 |
| NutritionFacts\_Id | INT | NutritionFacts\_Id from NutritionFacts table | Foreign Key join to NutritionFacts table; Nullable |

**NutritionFacts**

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Description | Notes |
| NutritionFacts\_Id | INT | Auto Incremented Primary Key | Primary Key; Auto Increment, Unique, Non Null |
| Serving\_size | DECIMAL(6,2) | A product serving size | Nullable; Unsigned; Default 0.0 |
| Serving\_per\_container | DECIMAL(6,2) | A product serving per container | Nullable; Unsigned; Default 0.0 |
| Calories | DECIMAL(6,2) | A product calorie | Nullable; Unsigned; Default 0.0 |
| Saturated\_fat | DECIMAL(6,2) | A product saturated fat | Nullable; Unsigned; Default 0.0 |
| Trans\_fat | DECIMAL(6,2) | A product trans fat | Nullable; Unsigned; Default 0.0 |
| Sodium | DECIMAL(6,2) | A product sodium | Nullable; Unsigned; Default 0.0 |
| potassium | DECIMAL(6,2) | A product potassium | Nullable; Unsigned; Default 0.0 |
| cholesterol | DECIMAL(6,2) | A product cholesterol | Nullable; Unsigned; Default 0.0 |
| Dietary\_fiber | DECIMAL(6,2) | A product dietary fiber | Nullable; Unsigned; Default 0.0 |
| sugars | DECIMAL(6,2) | A product sugar | Nullable; Unsigned; Default 0.0 |

**Categories**

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Description | Notes |
| Category\_Id | INT | Auto Incremented Primary Key | Primary Key; Auto Increment, Unique, Non Null |
| Category | VARCHAR(64) | Product categories | Non Null; Default ‘TBD’ |

**Ways\_to\_pay**

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Description | Notes |
| Payment\_way\_Id | INT | Auto Incremented Primary Key | Primary Key; Auto Increment, Unique, Non Null |
| Payment\_way | VARCHAR(32) | Product categories | Non Null; Default ‘Cash’ |

**Customers\_to\_Receipts**

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Description | Notes |
| CToR\_Id | INT | Auto Incremented Primary Key | Primary Key; Auto Increment, Unique, Non Null |
| Customer\_Id | INT | Customer Id from Customers table | Foreign Key join to Customers table, |
| Receipt\_Id | INT | Receipt Id from receipts table | Foreign Key join to Receipts table |

**Receipts\_to\_Products**

|  |  |  |  |
| --- | --- | --- | --- |
| Column Name | Data Type | Description | Notes |
| RToP\_Id | INT | Auto Incremented Primary Key | Primary Key; Auto Increment, Unique, Non Null |
| Receipt\_Id | INT | Receipt Id from receipts table | Foreign Key join to Receipts table |
| Product\_Id | INT | Product Id from Products table | Foreign Key join to Products table, |
| quantity | INT | An quantity of product | Non Null; Unsigned; Default 0 |