

# Project Final Report

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# **1. Introduction**

This report discusses the result of the work done in development of independent student project: a web-based Content Management System (CMS). The project aims at the development of a mobile friendly CMS by using mainly Bootstrap (a front-end framework for designing mobile-first websites, which combines HTML, CSS, and JavaScript) and PHP (a server-side scripting language).

## **2. The Problem**

The Green Farm store sells products like vegetables, fruits, and grains. The store is in need of tool to manage records of their products, customers, and sales, as well as to make business decisions based on analyzing sales records.

## **3. The Solution**

A web based CMS can well suit the store needs. By supporting multiple users in a collaborative environment, the system can manage the creation and modification of all records for the farm store. It also provides tools for data visualization and analysis.

## **4. Scope of The Work**

- Khan Academy, W3Schools, and php.net were the main source of learning programming languages need;
- The HTTP server was built on a PC with an archetypal mode of LAPP (Debian 9.2, Apache 2.0, PostgreSQL 10.0, and PHP 7.0);

- The website scripting was written in HTML, CSS, and JavaScript by using Bootstrap 4.1.3 framework, and PHP 7.0 was used as server-side scripting language to connect HTML pages with the PostgreSQL database;
- Online jQuery library named *Data Tables* was used to generate various tables, and another online JavaScript and PHP library named *FusionCharts* was used to generate various charts;
- Visual Studio Code 1.29 was the main scripting editor, while Git 2.17.1 was used for version control, and GitHub was used as the cloud repository.

## 5. Summary

The object of designing a web-based CMS was fully achieved. The finished work can be used as a full functional website for the farm store. Future development may include adding more security functions and attractive web elements like photos, animations, and sound.

## Appendix A. Incomplete Task

The finished system should be able to defend itself from attacks like SQL injection. However, this feature was not able to deploy in time as the learning of programming languages and the developing of system main features consumed more time than expectation.

## Appendix B. System Documentation

### B1) Listing of Programs

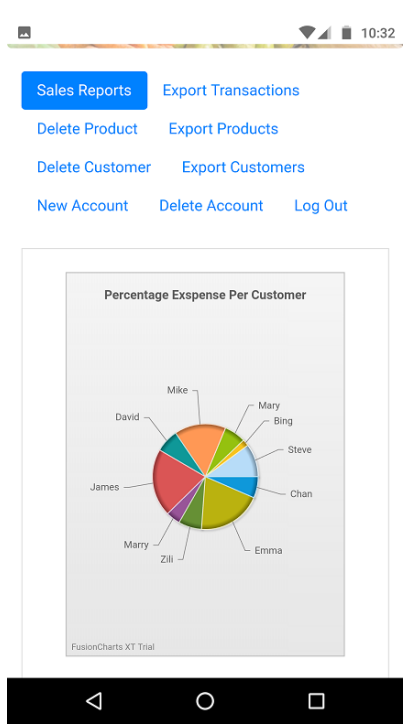
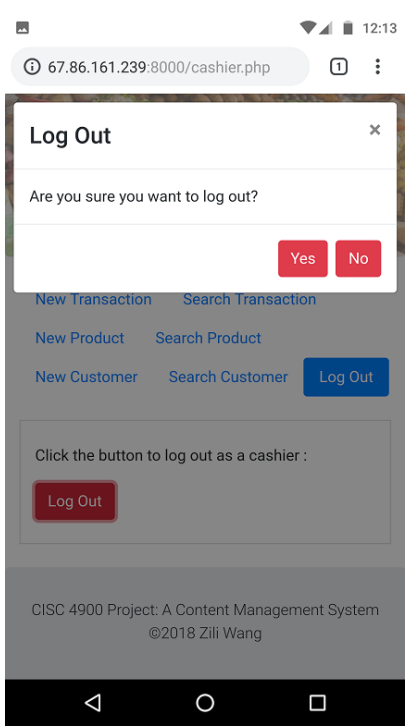
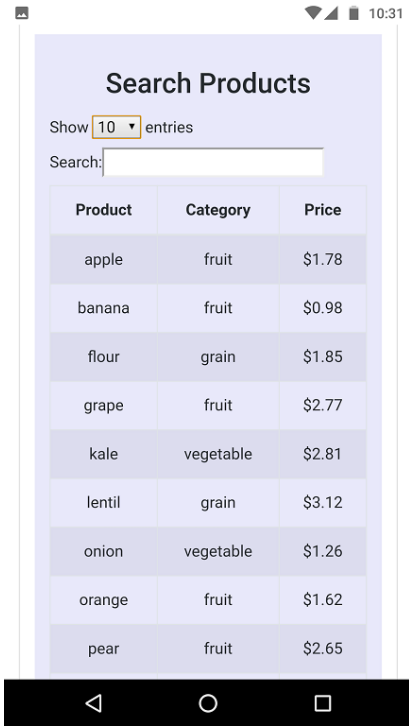
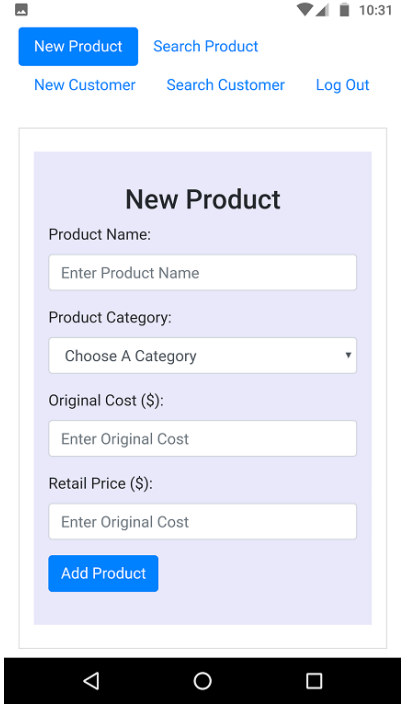
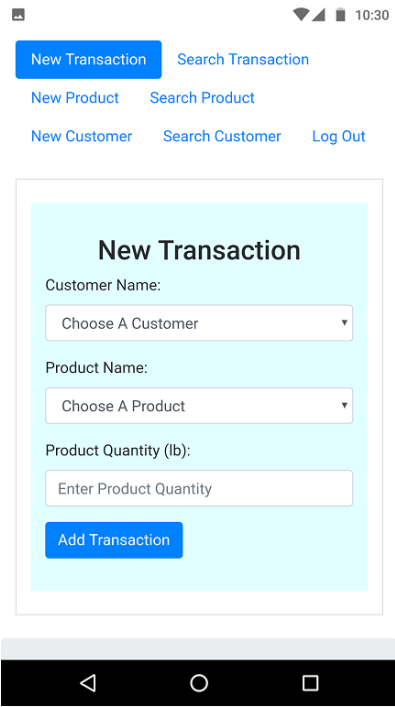
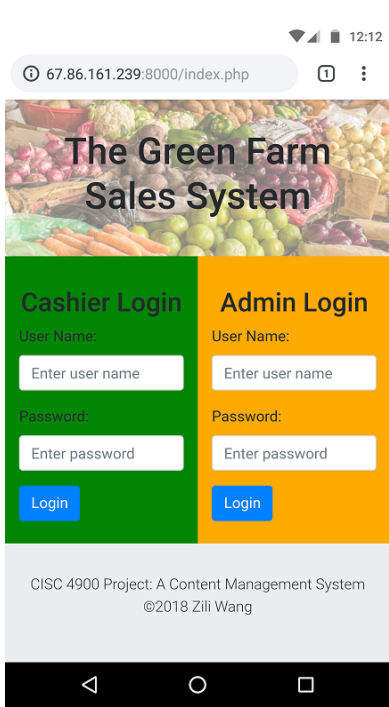
Complete code with comments can be access at <https://github.com/ziliwang912/CMS>.

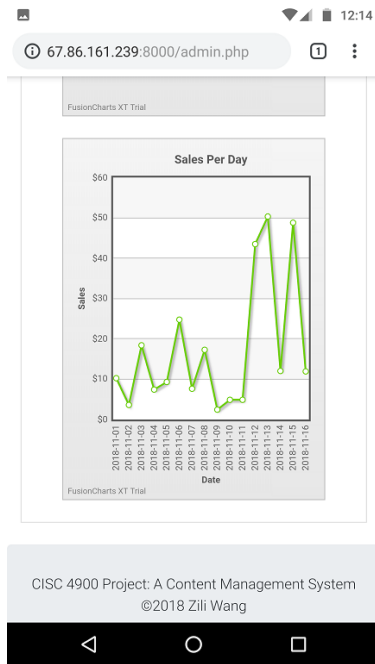
Here is the file tree of the program repository:

```

| README.md          -----> Repository Readme
|
|--- database
|   | data_import.sql -----> Scripting for import raw data into database
|   |--- data
|   |   customers.csv
|   |   products.csv
|   |   transactions.csv
|   |   users.csv
|
|--- html
|   | admin.php          -----> HTML and a little PHP scripting to show web
|   | cashier.php        -----> Admin interface
|   | index.php          -----> Cashier interface
|   |
|   |--- action
|   |   | add_acco.php
|   |   | add_cust.php
|   |   | add_prod.php
|   |   | add_trans.php
|   |   | check_admin.php
|   |   | check_cashier.php
|   |   | del_acco.php
|   |   | del_cust.php
|   |   | del_prod.php
|   |
|   |--- image
|   |   | farm.jpg        -----> Homepage, also login interface
|   |   |
|   |   |-----> Contains PHP scripting for interacting with database
|   |
|   |--- include
|   |   | fusioncharts.php -----> Backgroud image used in the web
|   |
|   |-----> Chart PHP library for show charts
```

B2) Website Preview





## B3) User Documentation

### B3a) Index Page

Users (cashiers or admins) can use mainstream web browsers on PC or mobile device to visit the CMS website. The address is <http://67.86.161.239:8000/index.php>. The index page is basically a login interface. The credentials are as following:

<i>User Type</i>	<i>User Name</i>	<i>User Password</i>
cashier	tom	tom123
admin	admin	admin123

### B3b) Cashier Page

Once login-ed in as a cashier, one can add new “Transaction”, “Product”, or “Customer”, as well as view/search individual record of the three. The transaction pages contain info about sales records; the product pages contain info about product, such as product category, price; the customer pages contains

the list of customers who are already registered in the store. The “Log Out” button will lead one back to Index page.

### **B3c) Admin Page**

Once login-ed in as an admin, one can delete individual record of product, customer, as well as website account. She can also views and exports all records in form of CSV, PDF, or directly printing. She has the privilege to register new account of cashier or admin. The default view of Admin page provides two charts of analytic data visualization: percentage expense per customer and sales per day.

## **Appendix C. Project Log**

<b>Date</b>	<b>Hours</b>	<b>Activity</b>
06/05/18	1	Meet Prof. Augenstein and talk about project supervisor
06/06/18	4	Talk about project proposal with Prof. Goetz over phone and through emails
06/07/18	5	Do research about project problem and solution
06/08/18	4	Write and Revise project proposal
06/09/18	7	Setting up virtual server
06/10/18	6	Learn the very basic of Bootstrap; Install VS Code and Git
06/12/18	3	Reconfigure Git as it didn't work properly with GitHub
08/02/18	4	Initial price database in PostgreSQL
08/03/18	4	Continue working on database and learning HTML/CSS on Khan Academy
08/07/18	6	Make self-defined homepage run on Apache2 server
08/08/18	5	Learn intro to HTML/CSS, HTML tags, CSS rules on Khan Academy
08/11/18	4	Learn web development tools, CSS layouts, and more on Khan Academy
08/12/18	5	Learn CSS selectors, text properties, and ways to embed CSS on Khan Academy
08/13/18	4	Learn intro to JavaScript on Khan Academy
08/20/18	4	Learn JavaScript interactive, variables, and text on Khan Academy
08/22/18	4	Learn Object-Oriented JavaScript on Khan Academy
08/22/18	4	Learn interactive HTML/JS on Khan Academy
08/26/18	4	Learn JS and DOM on Khan Academy
08/28/18	4	Learn jQuery on Khan Academy

Date	Hours	Activity
08/29/18	3	Learn how to making web-pages interactive with jQuery on Khan Academy
08/30/18	3	Learn Bootstrap 4 basic on w3schools
08/31/18	4	Learn Bootstrap 4 grid, typography on w3schools
09/02/18	3	Learn Bootstrap 4 table, button on w3schools
09/03/18	3	Learn Bootstrap 4 dropdown menu on w3schools
09/04/18	2	Learn Bootstrap 4 form on w3schools
10/22/18	7	Learn Bootstrap 4 input form, JS modal on w3schools
10/23/18	8	Learn Bootstrap 4 templates on w3schools and Google
10/24/18	5	Learn more Bootstrap 4 templates on w3schools and Google
10/25/18	5	Learn PHP basic on w3schools and php.net
10/26/18	3	Learn more PHP basic on w3schools and php.net
10/27/18	8	Learn PHP and PostgreSQL interaction on php.net
10/28/18	6	Start to design web pages
10/30/18	6	Redesign database and import new data into PostgreSQL database
10/31/18	2	Modify data in the database
11/01/18	3	Build main page
11/02/18	6	Make PHP connected with database
11/05/18	4	Finish main page by adding user authentication
11/06/18	6	Design cashier page
11/07/18	7	Build cashier page, adding input forms
11/08/18	10	Finish cashier page by adding log out and dynamic tables
11/09/18	5	Design admin page and start adding features
11/11/18	8	Build admin page, adding input forms and other features
11/12/18	12	Build admin page, trying to add charts
11/13/18	10	Make changes to the whole website
11/14/18	12	Add charts to admin page, make small changes to the whole website
11/15/18	8	Finish the final report

Total logged study time: **241 hours**.



## **Appendix D. Personal Evaluation**

Through the development of the project, I learned at least four new programming languages: HTML, CSS, JavaScript, and PHP. I also gained a lot of chances to practice my skills at Linux, SQL, VS Code editor, and Git version control. The most import of all, I designed and deployed my first actually useful website from scratch.

There are some disappointments as well. I couldn't add too many security features to my website. Features like input validation, md5 encoding for password, PHP session login, and prevention of SQL injection, are all vital to real life web service. The lacking of attractive web elements, like pictures and animations, is also a downside.

Nevertheless, I am grateful for being able to accomplish the main objectives of the project.