

## CSE278 Systems I

### Programming Assignment#4: Web Application with CGI and MySQL using C++

The objective of this assignment is to design and develop a fully functional web application with CGI and MySQL. In addition to HTML, the CGI programs and the code for connecting to MySQL must be written in C++; you are free to use stylesheets (CSS) and JavaScript if you wish for styling and client-side verification of form content. While the focus of the assignment is on functionality, make sure your application is well organized and presented....and not just a collection of buttons to perform random functions or services. **Design it with love!**

There are many front-end frameworks that are easy to use to develop nice web pages...you may use any front-end framework you wish, especially if you want your app to be mobile-friendly. However, using a front-end framework is not a requirement – just make sure your application is not just a collection of buttons on the same page.

#### The Task

Design and develop a novel, easy to use, and useful web application of your choice. It must accomplish something useful, has some novel features, and presents information in a nice format. Think about a web application that is needed on-campus, or ask family members if they need an app for their business or organization.

The application must allow users to:

- Register to create an account (first name, last name, email address, street address, city, state, zip or postal code, country – you may add other fields). While email confirmations are not required, feel free to integrate email support – there are many APIs for doing so.
- Login using username and password (password must be masked while being typed). You decide how to create a username and/or password. Think about the registration process (perhaps use the email address as the username and generate a random password...you decide).
- Once a user is successfully logged in, the application must provide at least 3 unique services nicely presented and not just three buttons. Think e-commerce, social apps, flight booking, hotel management, etc.

**Note:** *Applications with simple math functions, or a collection of random functions/services are not suitable for this programming assignment.*

*Please accept the assignment on Github (see link below) and note that I am not providing any starter code, but you are free to use any of the CGI and MySQL code we have developed in class as a starting point for your application.*

## Guidelines – Must...

- Use C++ for CGI programs. You will need a CGI program for each function/service (i.e. each submit button on a form needs to be handled by a different CGI program).
- Use C++ to connect to MySQL to perform create/read/update/delete queries.
- Have at least 3 tables in the MySQL database.
- Passwords must be saved in the MySQL database in a hashed or encrypted format.
- Have fully documented C++ code for CGI and MySQL programs.
- Provide a one-page Word or PDF document (readme) describing your Web application.
- Demo your completed application to the instructor (details below).

No need to submit your idea for approval, just make sure it satisfies the above criteria and it is not simple math calculations. The instructor is available during office hours to discuss and brainstorm your idea. If there is a particular HTML/CSS/JavaScript code or library you'd like to use in your application, please check with the instructor.

## Demo and Submission Guidelines

- **Demo (65%):** to avoid any misconfiguration issues when testing your application, every student must demo (in-person) their completed application to Dr.Q. In this demo (5-minutes – you may want to use one or two slides to show the architecture of your application) you will explain what you have designed and built, demo the application functionality and show the updates to the MySQL database tables. The demos will be scheduled during the lab times (using student last names for each lab section) on Monday & Tuesday (Nov 28 & 29).
- **Submit source code and documentation (35%):** submit your source code (C++, HTML, CSS, JavaScript), readme file, and any support files on Github **by 11:59pm on Wednesday, Nov 30** with eight-hour grace period (i.e. you can submit by 7:59am on Thursday, Dec 1 with no penalty). Submissions after that time must be made via Canvas email (to Zhewen and CC Dr.Q) and are subject to 10% penalty/day. Here is the Github assignment link – ensure you select the correct name if needed before you proceed:  
<https://classroom.github.com/a/9RFcYPNF>

## Grading Rubrics

The following rubrics will be used as a guideline:

Item (%)	Excellent (full mark)	Good (75%)	Satisfactory (50%)	Unsatisfactory (25%)	Zero (zero)
<b>Novelty, functionality, and app organization and</b>	Novel idea and fully functional, app is nicely organized and presented, no	Re-inventing the wheel with no value-added, not well organized or presented.	Basic idea and functionality, poor presentation and organization.	Nothing special, error messages or blank pages during runtime.	Doesn't work.

<b>presentation style (65%)</b>	errors when using functions/services.		The app is presented as a collection of buttons to perform each service.		
<b>Readme file (15%)</b>	Clear details about the objective of the application, its architecture and database organization. Includes an architecture diagram and database schemas.	Good details are provided about the application, its architecture and database organization.	minimal details on the purpose of the application, its architecture and database organization.	It is not clear what is the purpose of the application, how it is organized internally.	No readme file is provided.
<b>Source code and documentation (20%)</b>	Follows coding standards. Fully documented, including purpose of program.	Readable source code, doesn't follow coding standards, not everything is documented.	Spaghetti code, basic minimal documentation.	Code provided is incomplete or does not make sense, documentation does not help understand the code.	No source code provided or the source code is not accessible, no documentation.