Group 22 Final Project Report:

Project Name: STEM Kids NYC

Project Contributors: Asha Owens, Katie Liu (SW), Gregory Cho (SW), Daniel Chimes, Aditya Bathla

Purpose of Web Application:

The stated purpose of this application is to provide a website that serves as a distribution platform for STEM materials to supplement the learning of underprivileged individuals in the New York City area as well as to disseminate interest in STEM fields to people with minimal prior exposure. The application additionally serves as a data collection tool for Yvonne and her team to use for research purposes.

Group Implemented Elements:

The Group was given the responsibility of implementing the application’s independently named “Learning Management System” hereafter known as LMS. The LMS maintains data storage qualities that are analogous to a traditional DBMS’s but handles information on individual student progress in terms of courses and lectures. Regarding application functionality, as per the requests of the project beneficiary, Yvonne, the final product maintains a fully functioning database (in third normal form), UI to supplement course and class database insertions, a fully functioning profile page, lecture and course displays, functioning lecture quizzes, and encryption of essential personal information. In addition, the group implemented certain elements that were not mandated by the beneficiary, such as a minimally functioning admin page for individuals with privileged access to add courses and respective lectures.

Project Implementation Stages:

Due to the relatively large scope and scale of the project as well as our own collective ambitions having obfuscated the actual viability of the initially exacting requirements, a significant and comprehensive negation period was necessary to moderate the expectations of the beneficiary, Yvonne, and to reassess group objectives. Upon agreeing on a set of requirements the group members responsible for front end development created mockups, in collaboration with and to the satisfaction of the beneficiary, and developed front end (i.e. UI/UEx) templates and elements pertaining to all necessary program aspects. The full list of front end elements can be found in the updated\_html folder of the project.

Backend development, rather unfortunately, started rather late (with two weeks left) as difficulties regarding effective means of communication and personal incidents on the part of the beneficiary impeded overall progress. Individuals who were responsible for software/backend development maintained the arduous task of developing a database schema and programming practically all backend elements as well as some front-end aspects to ensure overall functionality. The primary files of concern are the loader, which contains the database schema, and the server which handles all front-end/backend interactions. The database schema was designed to be in third normal form to avoid redundancy and ensure effective queries. Further details regarding the server can be found in the project README.

Project Concerns:

Unfortunately, as a result of the groups relative nascency regarding large project software engineering, and an unavoidable lack of communication between parties, it would be hubris to not assume it likely that some edge cases have been left unaccounted for. While the project has met all necessary requirements and even surpassed expectations regarding functionality, the group maintains that it is probable that there are significant bugs which were not found during the testing and programming process.

Testing:

Early stage testing of the UI and UEx elements were conducted during the testing lab done prior to the projects presentation (findings may be found in the corresponding report). In terms of security, the program is effective at encrypting all important personal information utilizing salting methods and node’s built in RSA encryption algorithms. Further functionality related testing was conducted shortly after backend development was completed.

Beneficiary Feedback:

While communicating with Yvonne and her web developer they expressed their excitement and content with the progress the team has made. Further suggestions on functionality were made to make future development relatively easy for the beneficiary of the project.

Suggested Elements to Implementation (not elements that were required):

* logout function for the admin pages
* UI to supplement course and lecture updates (DB insertion and presentation already handled)
* limited course presentation on the user profile page
* improve method of keeping track of logged in individuals (currently a server side array)

Conclusion:

Given the initial prodigious task of developing an entire learning platform and application, the group has managed to exceed required functionality. Despite minor setbacks, we, as a group, can honestly state (with much apprehension and pride) that this functioning web application will, at the very minimum, serve as a strong foundation on which anybody can continue to build. All aspects regarding functionality have been met and we have even implemented elements that go beyond what was deemed necessary.