

LEO - Learning and Educating Online

For this project, I chose option 2 because I felt this option would provide the flexibility needed to directly tackle a new social issue. In this case, I wanted to tackle an issue that addresses access to educational resources. This issue is significant to me because I have directly benefited from programs which aim to provide educational resources. This issue is of great concern as it has led to ever increasing racial and economic disparities in education and STEM across the country. Here in New Jersey, these disparities predominate.

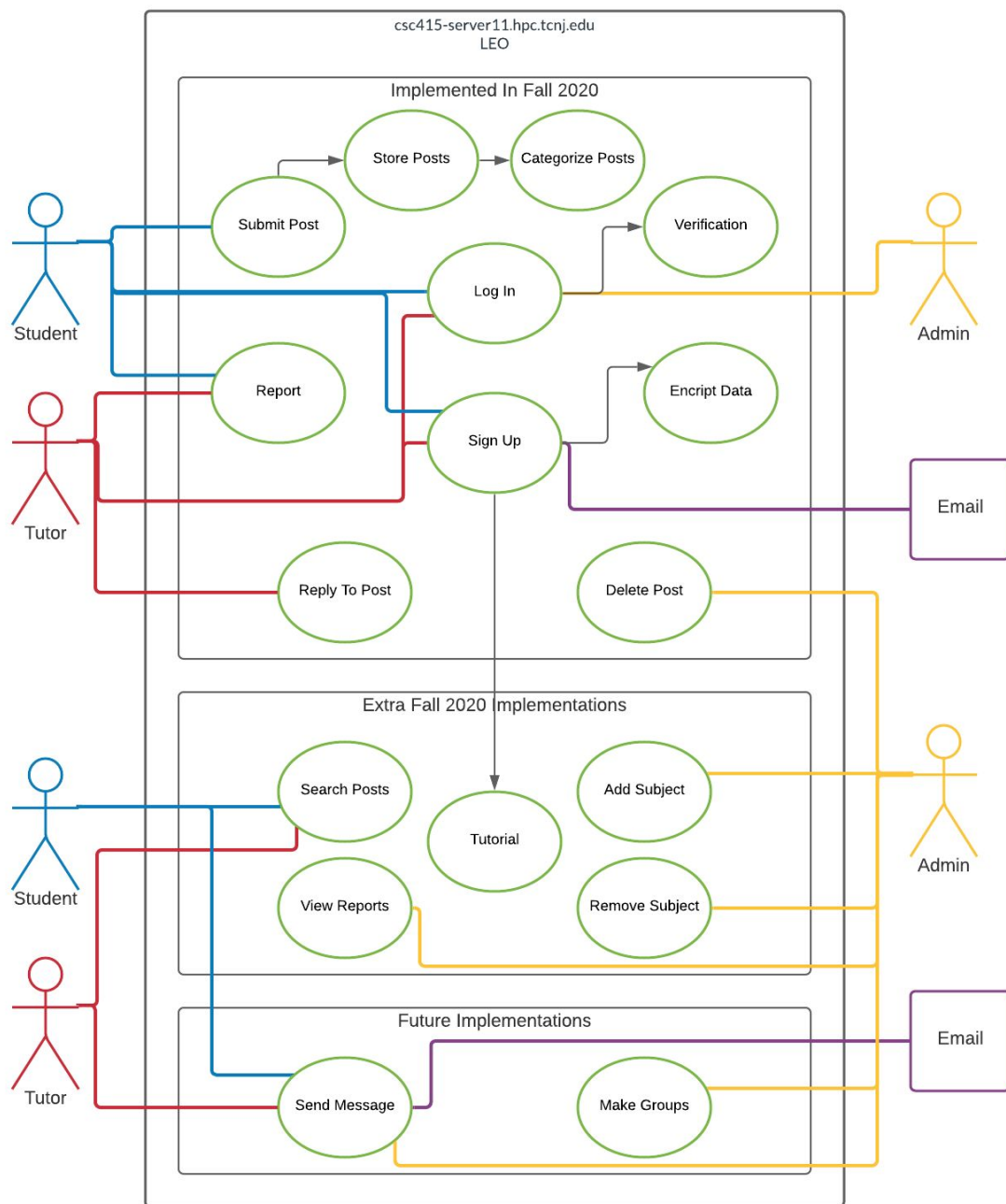
Although New Jersey ranks among the top states in education, it has one of the largest racial educational gaps due to the segregatory nature of its laws regarding school assignments to districts. In New Jersey, students must attend schools located in their district. This means that students living in poor districts will lack access to adequate resources. This problem is very prominent that the state faced a recent lawsuit regarding this issue^{[1][2]}. However, this educational gap will likely take years to dissipate regardless of this recent lawsuit.

Nowhere are the effects of this issue better witnessed than in Mercer County New Jersey. Mercer County has some of the lowest graduation rates; high school graduation rates among black and hispanic students are about 66% and 73%, respectively^[3]. One of the high schools in this county, Trenton Central High, has a student population that is predominantly made up of racial minorities with 75% of the total student population being eligible for free lunch; in this public school, the average SAT score was 828 in 2016.

The idea for this project is to create an online platform (LEO) that would offer the means for New Jersey college students to tutor high school students from low performing New Jersey counties in an effective and efficient manner. Tutoring is an effective resource for students to succeed in their academics, and in some cases, it can be a tide-turner for students. Tutoring can also make students interested and receptive to hard subjects such as STEM. From my countless experiences as a tutor, I have witnessed its effectiveness first hand. However, for tutoring to be effective, it must occur regularly and allow for a feedback loop to exist between tutor and tutee. This project offers exactly that to willing college student organizations seeking to do outreach to disadvantaged high school students. The program allows for time efficiency and regularity by offering an online platform. Additionally, this program offers tools to make the implementation of online tutoring effective at engagement, and specifically targets underprivileged students.

In this project, a sort-and-store algorithm will be needed to categorize the questions posted by users based on subject matter. This will allow the users to easily access specific subject questions. A searching algorithm will also be implemented, this would allow for quick access to any posted question. This algorithm can also be used by administrators to find specific accounts and access their activities. An algorithm for verifying users's login and signup information will also be of use to ensure that only targeted users can utilize the application. An algorithm for posting questions and replies would also be needed to ensure proper functionality of the application. This web application will use a PostgreSQL database to store, manage, and organize user activities, user posts, and subject matter. For this project, concepts such as abstraction, life cycle, and hierarchy will be reinforced. Encryption will be a new concept that will have to be learned to successfully implement this project.

Project Use Case Diagram



Project Timeline

- October 1 - Learn Javascript and HTML
- October 3 - Understand the domain & talking to tutors
- October 5 - Learn encryption
- October 8 - Understand the domain & talk to tutees and school admins/teachers
- October 7 - Study Rails & start imp. sign up, log in, and verification
- October 10 - Study Postgres & start imp. submit post, store post, and categorize post
- October 15 - (Assignment 3) Analysis and Design
- October 17 - Imp. report, delete post, and reply to post
- October 23 - Study encryption & imp. encryption
- October 26 - Imp. search post
- October 31 - Imp. add subject and remove subject
- November 5 - Imp. view reports and tutorial
- November 12 - (Assignment 4) Final Implementation

Sources

- [1] Hanna, Maddie. "N.J. School Segregation Lawsuit Inches toward Trial after Negotiations Stall." <https://www.inquirer.com>, The Philadelphia Inquirer, 30 May 2019, www.inquirer.com/news/school-segregation-new-jersey-lawsuit-phil-murphy-20190530.html.
- [2] Latino Action Network et al. v. The State of New Jersey et al.
- [3] Kilic, Fatih. "New Jersey graduation rates amongst minorities in different counties." (2017).