CSE 316: Fundamentals of Software Development

Final Project [100 points]

Fall 2020

Due: 27-Nov -2020 : 11:59 PM

Overview

Stony Brook is preparing to start mass weekly COVID19 testing for all students, faculty and hospital employees (approximately 28K people) using saliva tests. Since they cannot test all 28K samples, multiple tests will be mixed together in the same "pool" to be tested at once. A lab employee will put this pool in a testing "well" once it becomes available. If the well turns out negative, all the tests are negative. If the well turns out positive, they have to continue testing the remaining saliva for all the participants (also in this binary testing fashion, that is, 50% in a separate well and 50% in another well, and the process continues until all positives are found). From 1 saliva sample, they can dilute it to a fixed maximum number of samples (3-5). Given that the positivity cases rate is 0.97-1.29%, at most 50 samples will be batched together in the first step.

We will develop the Web interface for this testing.

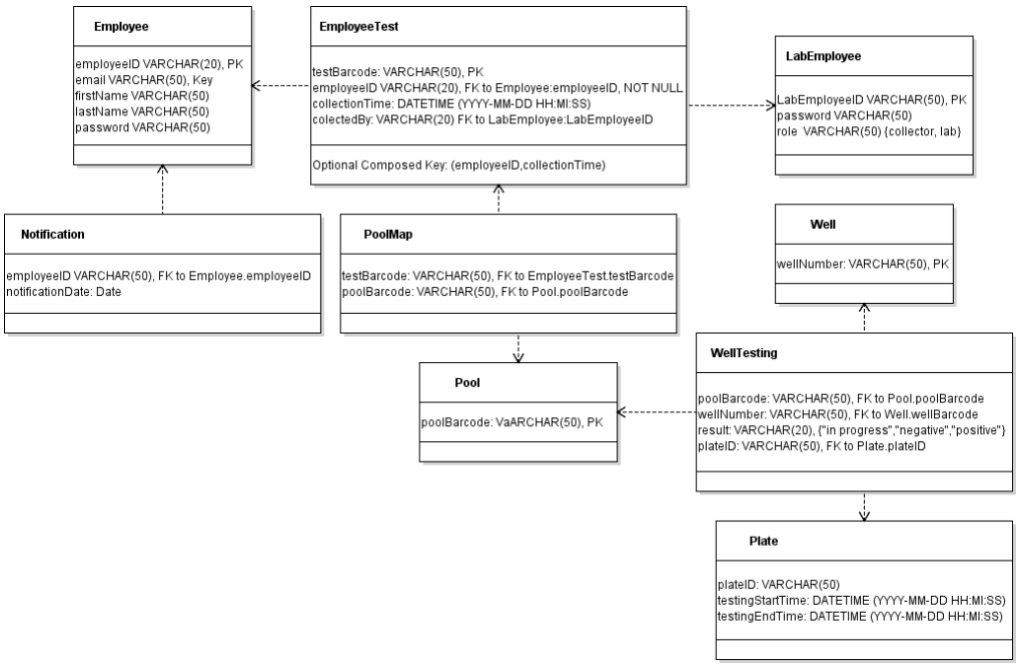
Development Teams

This project will be worked in teams of 2 students (in our class, there may be 1 group that will have 3 students since we have an odd number enrolled.) I will allow students to form their own teams. Please inform me of the teams as soon as possible.

Design Details

UML Database Schema

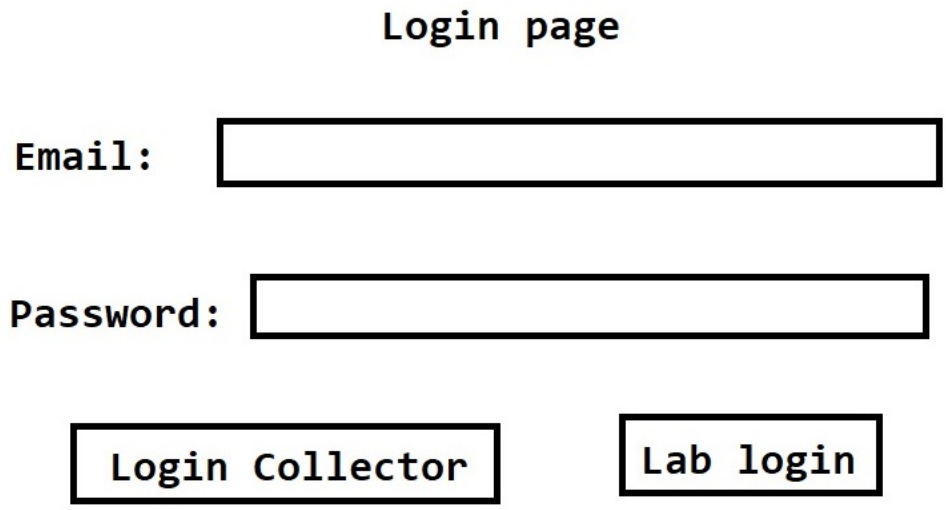
Following is a UML diagram showing the database schema:



Web Page Panels

Login page

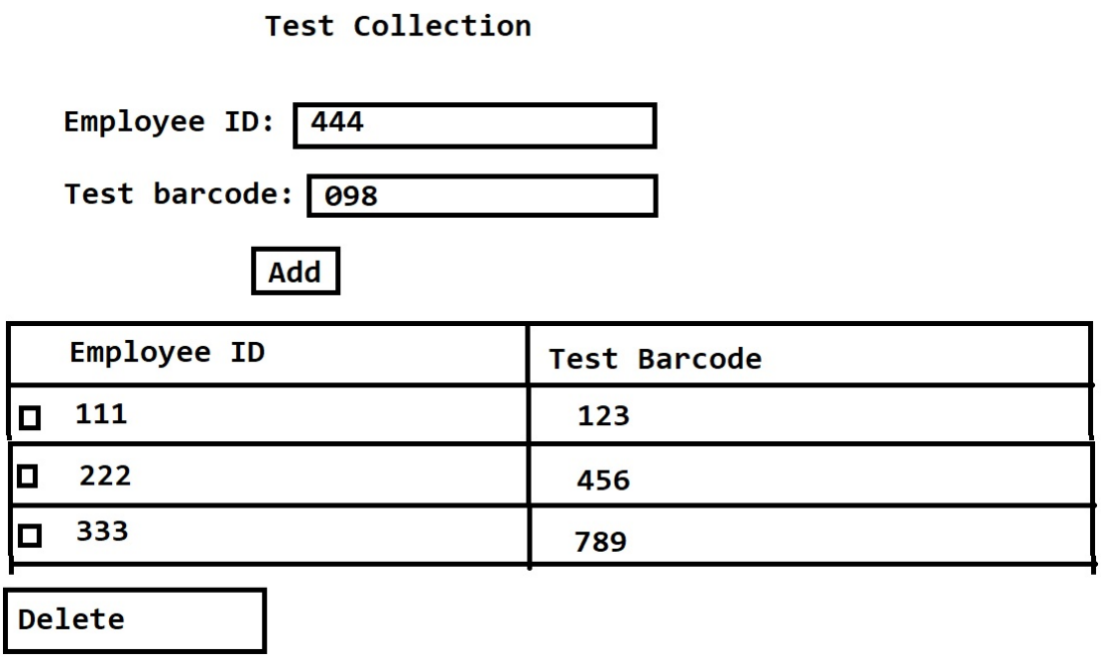
The application will support several panels. Some are for lab technicians to record collections being tested and record results of those tests. Some are for the Employee to check their results.



From the above login, the lab workder clicks ‘Login Collector’ or ‘Lab Login’ to determine the type of functionality they will get. The first opens the Test Collection page below. The second opens the ‘Lab Home’ page which is shown next.

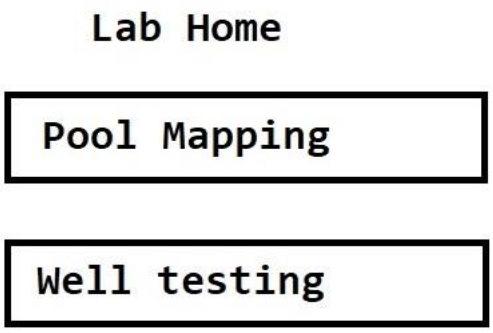
Test Collection Page

The Test Collection page is to register employees with their employee id and the current test barcode they are assigned (in a real world implementation, this would be read by a barcode scanner). Here we will just enter numbers. If an error is made, you can select the checkbox(s) and click 'Delete' to remove the entry.



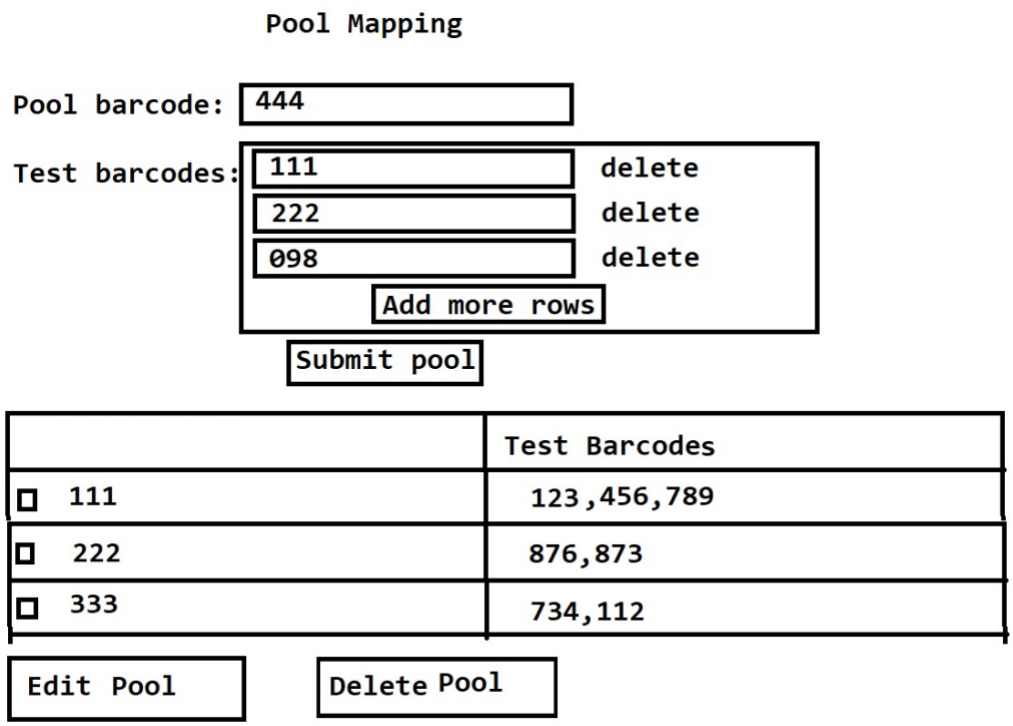
Lab Home Page

The Lab Home page provides access to the Pool Mapping and Well testing functions.



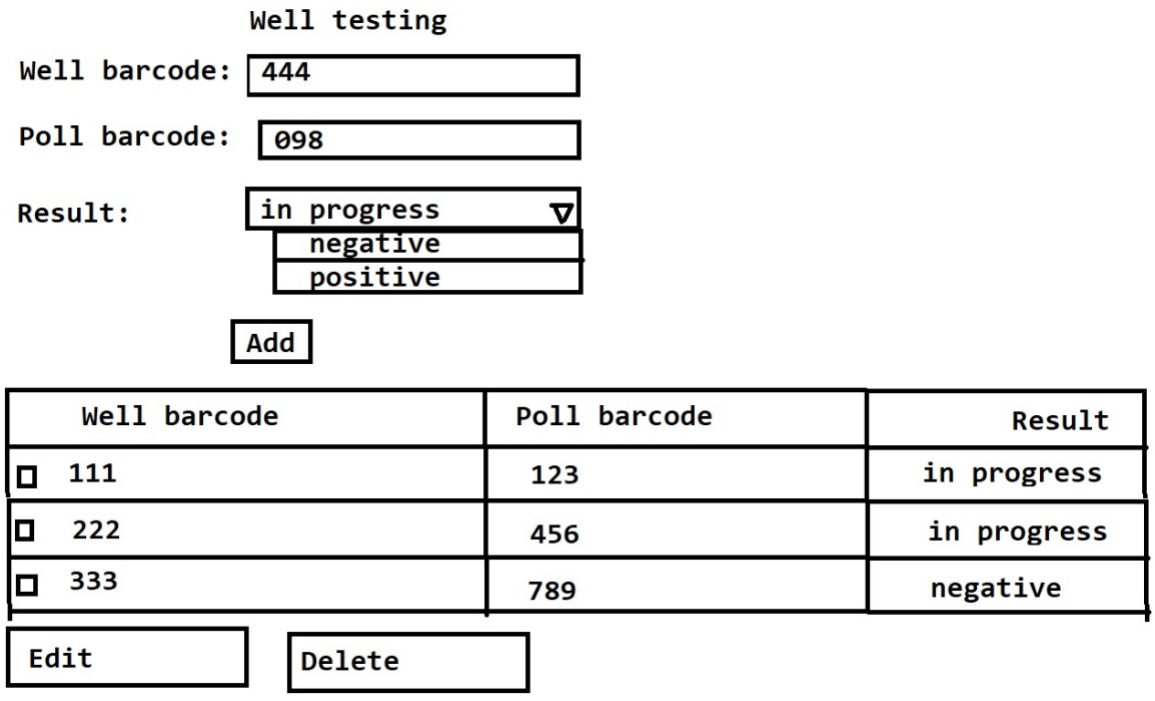
Pool Mapping Page

Pool mapping is performed to create a group of samples to test. The test barcode is used to identify the specimen. You can add as many tests as needed to a pool and then submit the pool for testing. The panel at the bottom shows the current pools with the list of associated test barcodes.



Well Testing Page

The Well testing page, the lab tech selects a well to set results. The default value is 'in progress'. A test is selected, and 'Edit' is clicked. This moves the data to the panel at the top of the page. They then use the drop down to change 'in progress' to the actual test result.



Employee Login Page

Finally, there is a login page for employees. When the employee logs in, they can access the results for each week's tests. That panel is shown below the login page.

Employee Login page for Results

Email:

Password:

Login

Employee Results Page

Employee home

Collection Date	Result
10/20/2020	negative
10/27/2020	negative
11/07/2020	in progress

Project Objectives

Build a complete web application which supports the use of a mysql database to track test collections and results.

The application will allow entering data for test pools and wells in addition to posting test results. It will also allow employees and students being tested to log in and check the results of tests on their samples.

The application will implement the functionality using Node-JS/Express/React and MySQL.

Requirements

1. The application **shall** support the panels shown above
2. The application **shall** use Express routes to direct the user to the appropriate login page.
3. The application **shall** direct the user to the lab tech login page when accessed with the url: <host:port>/labtech
4. The application **shall** direct the user to the employee login page when accessed with the url: <host:port>/employee
5. The application **shall** allow lab techs control over entry of test information and results using the lab related screens in the previous section
6. The application **shall** display accurate test results to employees who login with the employee login page.

Additional Implementation Notes

You will be working in very small teams. Mostly 2 students per team (due to enrollment count, one group may be 3 students.)

You will need to maintain a database on the backend. This database should be built with MySQL

You may style the panels of the application as you wish.

Submitting the File

Place all of the files for your project into a single directory tree.

Do NOT include node_modules! This contains a huge amount of code from packages installed to support the application. If you include it, 5 points will be lost from grade.

Zip up the files of the project into a file. Give that file the name <groupName>_covidTestingSite.zip. ‘groupName’ is the name or designation given to your team.

Upload your zip file to the **FinalProject** dropbox.