ELEC3225 Applied Programming Concepts

Assignment #2

Regis Lach

**Incremental Development Timeline:**

If the software development cycle uses the incremental development system, the primary objective is to allow students to view and register for courses and allow faculty and admin to also view and modify this data. As a result, the basic functionality will be the main priority, and additional improvements to the user experience will be implemented in future releases.

Stage 1 – Simple system:

* A simple database to store class information and user details for students, faculty and admins, as well as course information
* A table for each user type (student, faculty, admin), with first and last names and ID as the main attributes. Additionally, there will be some unique attributes/functionality depending on the user type.
  + Student
    - Registered courses and schedule
    - View and search courses
    - Add/drop courses
  + Faculty
    - View course roster and available courses
    - Print their schedules
  + Admin
    - Add/remove users
    - Search and print rosters/courses.
* A table to store the course catalogue and additional information.
  + Course name
  + CRN
  + Course dates/times
  + Professors associated with the course
* A login interface that requires the correct credentials to login. In the initial release, there are no additional features such as 2-factor authentication or overriding student restrictions. There will be an option to reset a password in case the user forgets their password.

With this simple system developed and tested, it would then be released for utilization by the school, with continuous observation of user feedback as additional features are designed for future releases.

Stage 2 – Additional Features:

* Add functionality to create multiple schedules, make printouts for schedules, and create preferences for schedules.
* Add course restrictions and prerequisites, which will prevent a student from registering for a course if they do not meet these.
* Add student count for each course.
* Allow admin to add/remove students from courses regardless of requirements and prerequisites met.
* Design an aesthetically pleasing user interface for users to interact with.
* Add 2-factor authentication to the login.
* Any additional feedback received by the users of the system. This will not take precedence over the other planned features unless it is an issue that cannot be ignored

**Integration and Configuration Timeline:**

Under this development model, we could take a wide range of routes. One is to start by integrating a more generalized tool and building most of the infrastructure from that. The other would be to look into a more complete system to integrate- one that has a database, and user system already set up. While the latter would likely be the quickest to configure and deploy, it would be the most expensive option. So instead, we will choose a more bare-bones system to integrate and configure.

Stage 1 – Research:

Stage 1 of this development model is a bit different from the first two. Here we would invest time in looking for the database model that would best suit our needs in terms of feature set and pricing. One popular option is Amazon Web Services (AWS), which offers an entire suite of tools to create both our database and user interface. This would be my option to use, as I have experience using this service to create and manage a database.

Stage 2 - Integration and Configuration:

Database:

With AWS, the tools to set up are readily available for use. Here the database and tables are created, and column names are specified according to the outlined requirements. AWS has two databases to choose from- dynamoDB and Timestream. As timestream is designed for time-based applications, we will choose dynamoDB for the school database.

UI:

While we are already in the AWS ecosystem, a possible option to use is [AWS Amplify](https://aws.amazon.com/amplify/), which offers a streamlined way to design and configure our UI. With this application our interface would be designed, and our user functions developed. This would follow the same schema as the waterfall timeline.

Stage 3 - Deployment and feedback:

With the database and UI configured, the next step is to deploy the system for use by the school. As part of AWS’s system, the process for setting up users is as simple as giving the administrator access to the framework of the system, where they can provide account details and add users to the system. Once the system is set up, we will be continuously monitoring user feedback and making any necessary fixes if they are discovered after release.