# CS 255 System Design Document

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## UML Diagrams

### Diagram Description automatically generatedUML Use Case Diagram

Diagram

Description automatically generated

### UML Activity Diagrams

#### Student Actor, Modify Own Session Reservation Use Case

Note: All Session Reservations are displayed, but sessions within a time limit to be determined by the client are disabled from editing by students. The time to be determined is referred to as "in modification window" when they can be modified by students.

*Graphical user interface, diagram, application

Description automatically generated*

#### User Actor, Reset Own Password Use Case

Graphical user interface, application

Description automatically generated

### UML Sequence Diagram

*Diagram, text

Description automatically generated*

### UML Class Diagram

Timeline

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## Technical Requirements

### Development Tools

For the development phase of the application, the tools that the software engineers will need to develop the system are:

* Development machines per software engineer running an operating system compatible with the system specifications, and adequate memory, hard disk space, and processing power.
* Integrated Development Environment (IDE) such as Visual Studio (VS), VS Code, or the developer’s preferred IDE.
* Code repository hosting service such as GitHub or BitBucket.
* Ticket tracking system such as Atlassian Jira.
* Continuous Integration/Continuous Deployment (CI/CD) platform such as Azure Pipelines or Google Cloud Build.
* Other development tools as needed such as LinqPad, Postman, Telerik Fiddler, etc.
* Communication software such as Slack, Email, etc.

### Hosting Hardware

For the hardware of this system, it is recommended to use a Platform as a Service such as Microsoft Azure or Digital Ocean. The services required from the platform are:

* Web Hosting service such as Azure Web Applications or Digital Ocean App Platform.
* Durable Function orchestration such as Azure Functions of Google Cloud Functions. This will be used to orchestrate the Extract, Transform, and Load (ETL) pipeline to sync data from the Department of Motor Vehicles (DMV).
* Elasticsearch instance for data persistence.
* Redis service for caching and performance.

### Third-Party Services

These services are external connections that the application with interface with to provide specific services. The required third party services are”

* Email Service such as SendGrid or MailChimp.
* Payment processing service such as Stripe or PayPal.
* Authorization Service such as Auth0 or FusionAuth.