# CS 255 System Design Document Template

This template lays out all the different sections that you need to complete for Project Two. Each section has guidance to prompt your thinking. You will need to continually reference the interview transcript as you work to make sure that you are addressing your client’s needs. There is no required length for the final document. Instead the goal is to complete each section based on what your client’s needs are. Remove this note when you are finished, and replace all bracketed text with the relevant information.

## UML Diagrams

### UML Use Case Diagram

### UML Activity Diagrams

### UML Sequence Diagram



### UML Class Diagram



## Technical Requirements

The system's hardware requirement includes a server. The server should be cloud based as preferred by the customer. This would also fulfill the automation of backing up the server and data and also to utilize the security system in place from the server provider. The server must be powerful enough to handle hosting the web application itself, manage the databases, and to process any information from any external systems in place quickly and smoothly as to not impact the end-user experience which also implies little server downtime. Those who work for DriverPass and will utilize the system(s) must have appropriate hardware and an internet connection to access the webapp to be able to access and modify relevant information.

The server should use some distribution of Linux that provides the speed, security, and maintainability required for smooth functionality. Linux is free to use, open source, light-weight, and has a lot of resources available online making it easy to design for and test on. Linux also supports a lot of services and applications necessary for running a headless server. Specifically, this webapp must use a webserver on the server itself to server the application's frontend. A popular choice is Nginx for its ability to handle high-traffic applications and security controls.

Databases are needed to store any persistent data like user data, reservations, lessons, test, etc. For the DriverPass system, an SQL databases like MySQL or PostgreSQL is recommended as it is based on the relational model where data is organized in tables with predefined relationships. The relational model is a great fit for this as user data and the other persistent data are all structured and related to one another. An SQL database supports scalability, flexibility, and data integrity with the tools it has for querying and manipulating data and the way it performs those actions ensures consistency and accuracy. There is the added benefit of an SQL database having high compatibility with different operating systems and languages making it easier to integrate and use components from external systems into DriverPass.

The tools required for this system include an IDE for the actual development and testing of the system and its components. The most popular choice is VS Code. While not an explicitly an IDE, it has a built in extensions page to download any needed tools and supports almost any programming language, high customizability, and has a large community making it easier to find support or resources. Another tool would be GitHub or GitLab for CI/CD to enable automating builds, tests, and deployment.

To ensure that the webapp has minimal downtime, a cloud based server was recommended. Specifically, a cloud platform that is reputable like AWS or Azure come with tools for scalability, and management that support reliability.

With the infrastructure, security is always a big concern when it comes to hosting something online and especially when it will store user's sensitive information like their password, address, or other personal information. This requires implementing security protocols like SSL/TLS for all incoming and outgoing connections for encryption of any communicated data.

The DriverPass system should take advantage of the cloud platform's tools for backing up and data recovery in the event of a cyberattack or corruption.