CS 255 System Design Document

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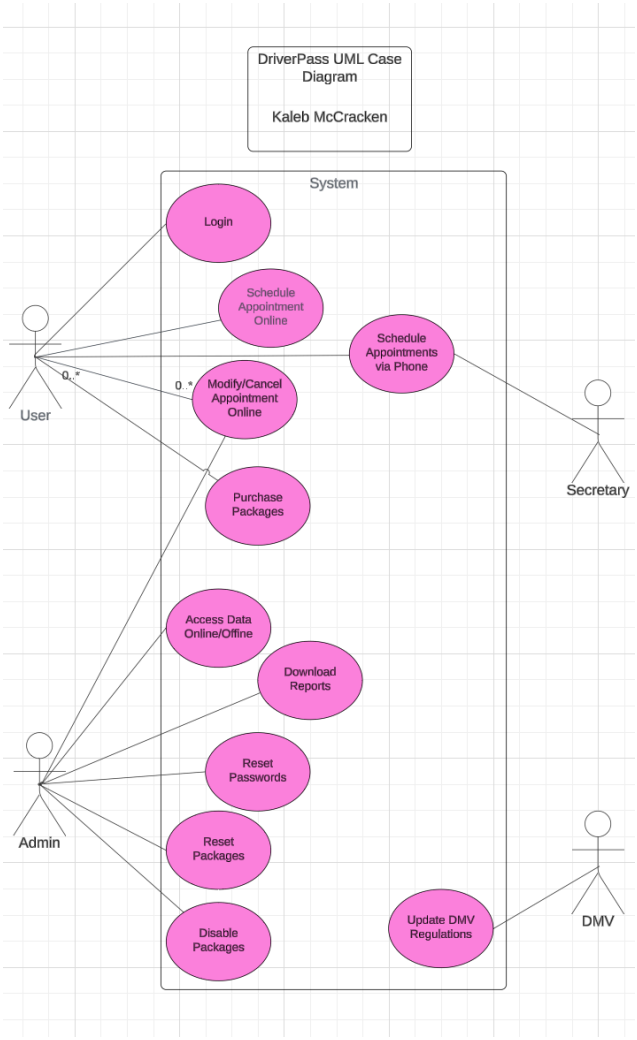
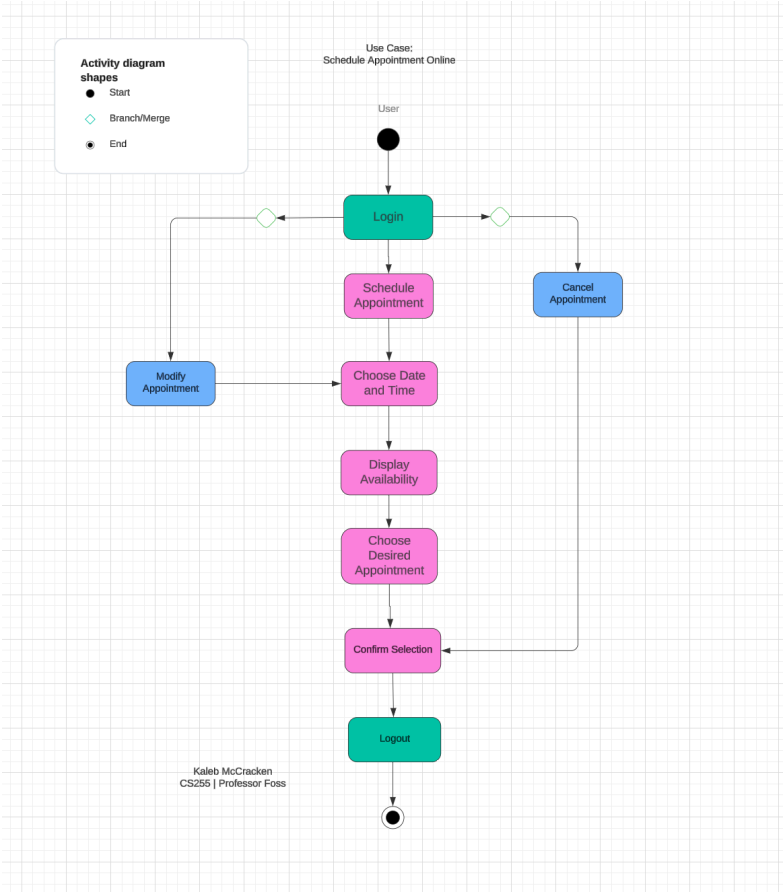
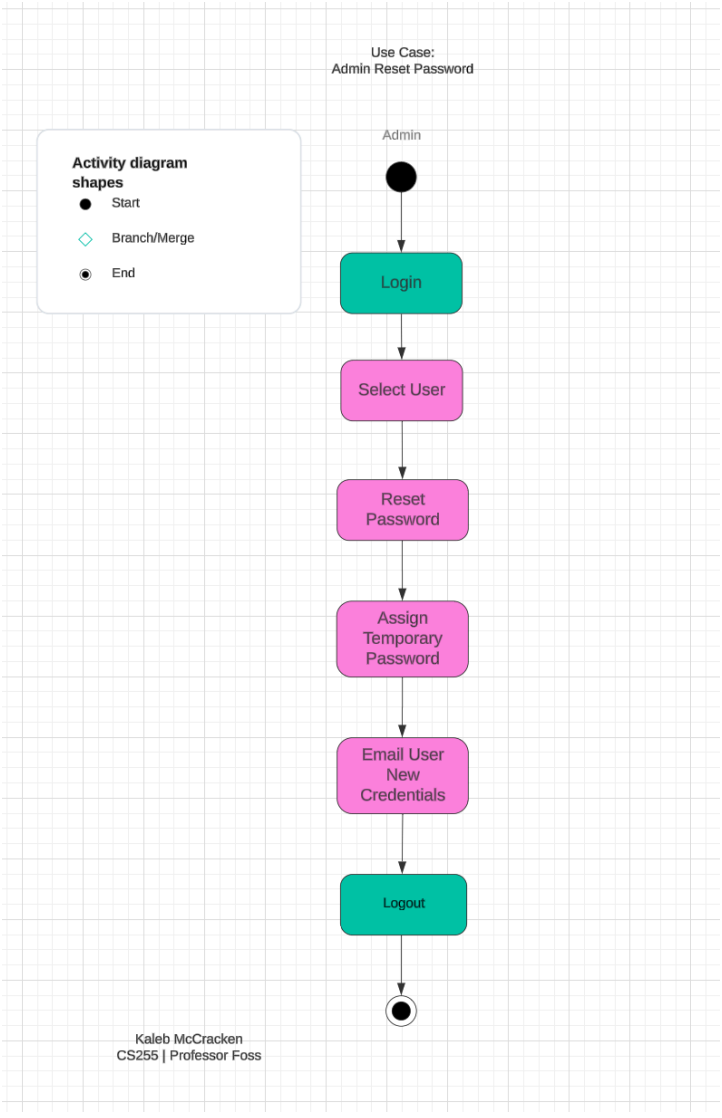
UML Diagrams

UML Use Case Diagram

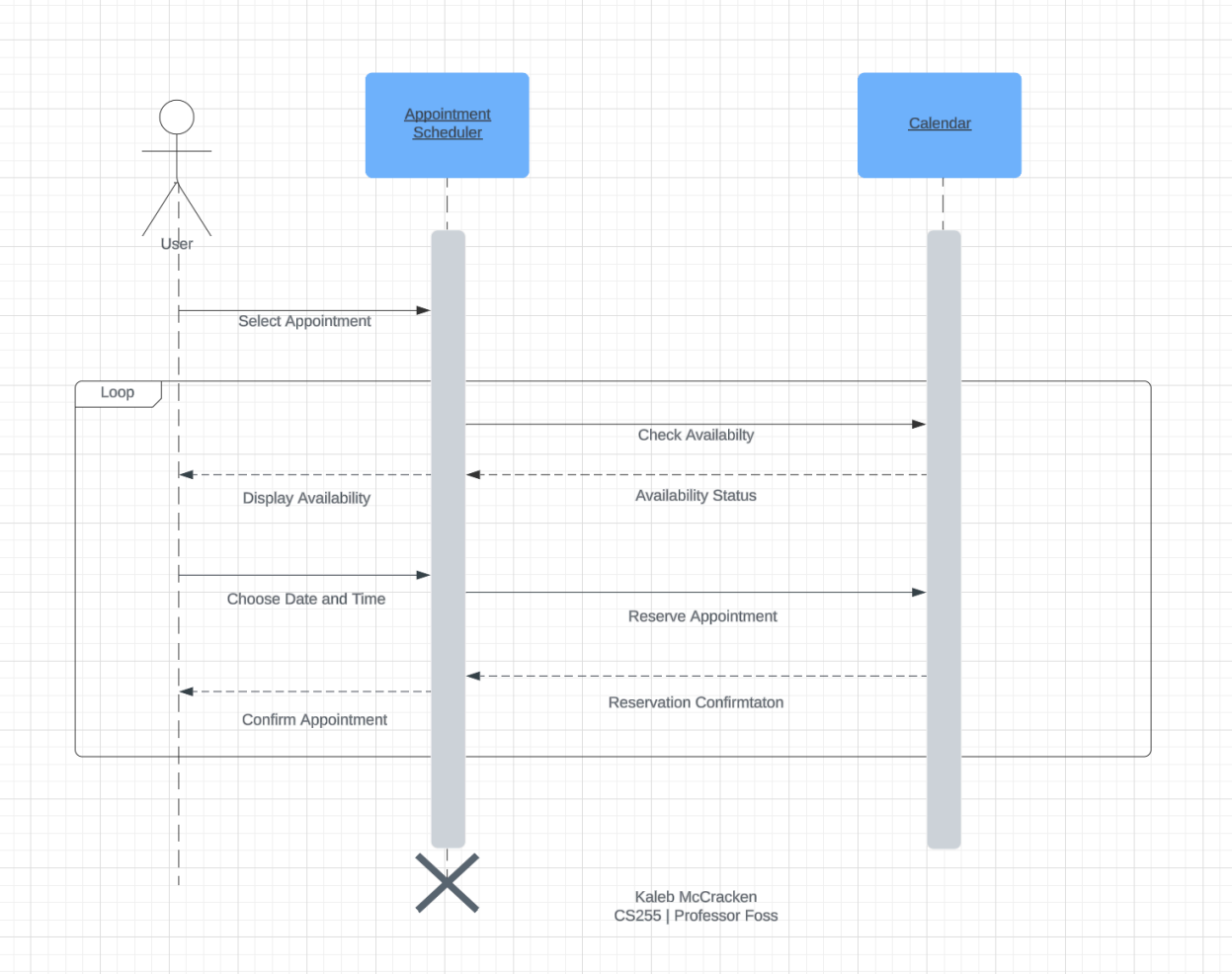


UML Activity Diagrams

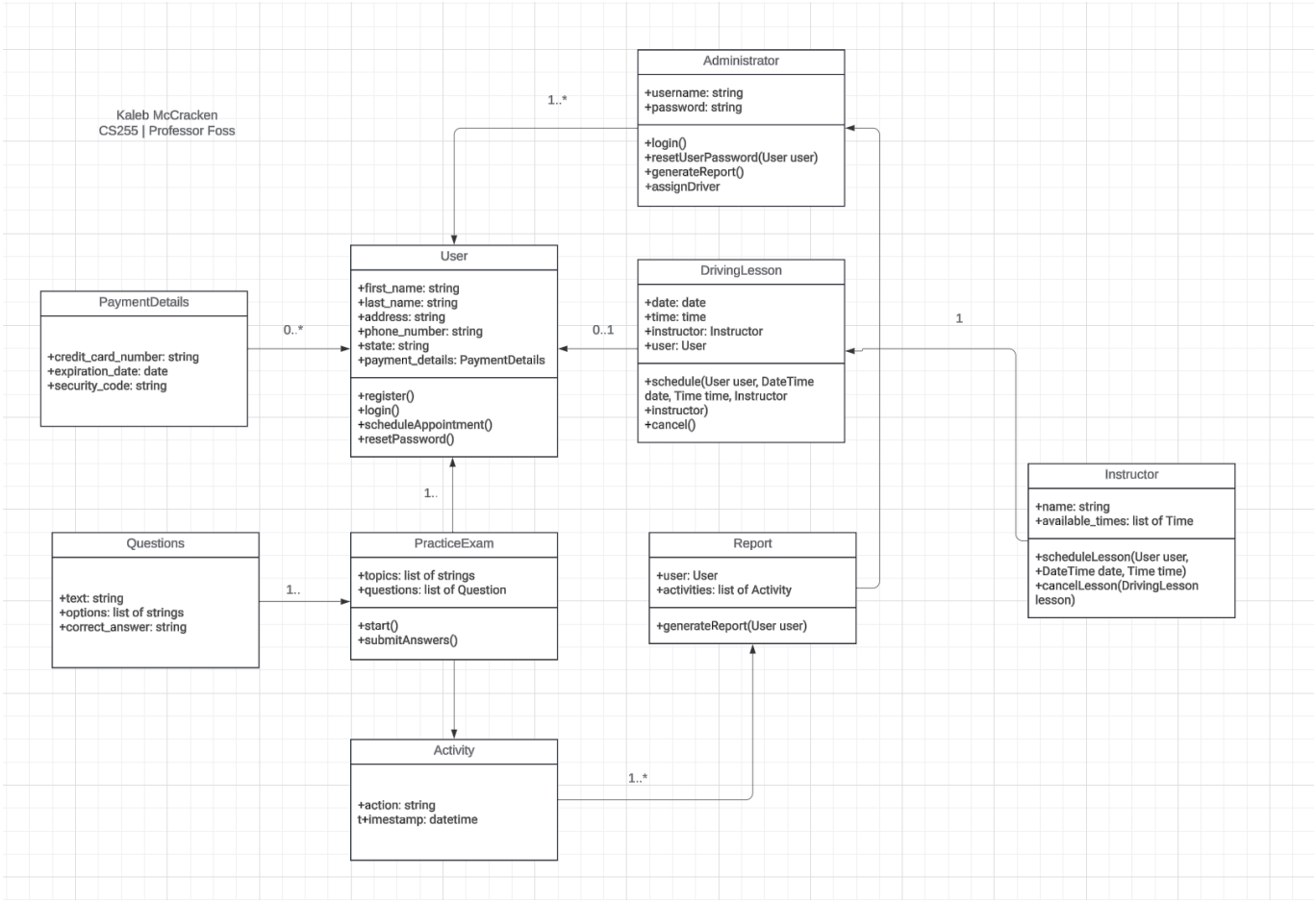




UML Sequence Diagram



UML Class Diagram



Technical Requirements

Based on the business requirements and system design outlined above, the technical requirements for the DriverPass system can be described as follows:

Hardware Requirements:

- Servers: Robust servers capable of handling web traffic, storing data, and running the application logic.
- Storage: Adequate storage capacity to store user data, practice exams, downloadable materials, and reports.
- Networking Equipment: Reliable networking equipment to ensure seamless communication between clients and servers.

Software Requirements:

- Operating System: The servers should run on stable and secure operating systems suitable for web applications.

- Web Server: A web server software to serve web pages and manage web application components.
- Database Management System: A DBMS to store and manage user data, practice exams, and system-related information.
- Programming Languages: Backend and frontend programming languages for development.
- Development Frameworks: Frameworks to streamline development and provide common functionalities.
- CASE Tools: Tools like Lucidchart for creating and maintaining UML diagrams.

Tools and Infrastructure:

- Integrated Development Environment (IDE): Developers need IDEs for writing, testing, and debugging code.
- Version Control System (VCS): A VCS like Git for collaborative development and version control.
- CI/CD Tools: Tools for automating the development pipeline, including building, testing, and deployment.
- Monitoring and Logging Tools: Tools for monitoring system performance and troubleshooting issues.
- Security Tools: Measures like encryption, SSL certificates, and firewalls to protect user data.

Infrastructure:

- Cloud Infrastructure: Leveraging cloud services for scalability, reliability, and flexibility.
- Load Balancing: Load balancers to distribute web traffic across multiple servers.
- Disaster Recovery and Backup: Backup strategies and disaster recovery plans to minimize downtime and data loss.

Security Requirements:

- Secure Login Mechanisms: Implementing secure login mechanisms to authenticate users.
- Data Encryption: Encrypting sensitive user information to protect it from unauthorized access.
- User Role Management: Defining user roles with varying levels of access rights.
- Brute Force Protection: Implementing measures to prevent brute force hacking attempts.
- Password Recovery Mechanism: Providing a mechanism for users to reset their passwords.

By meeting these technical requirements, the DriverPass system can be developed, deployed, and maintained effectively, ensuring reliability, scalability, security, and performance for its users.