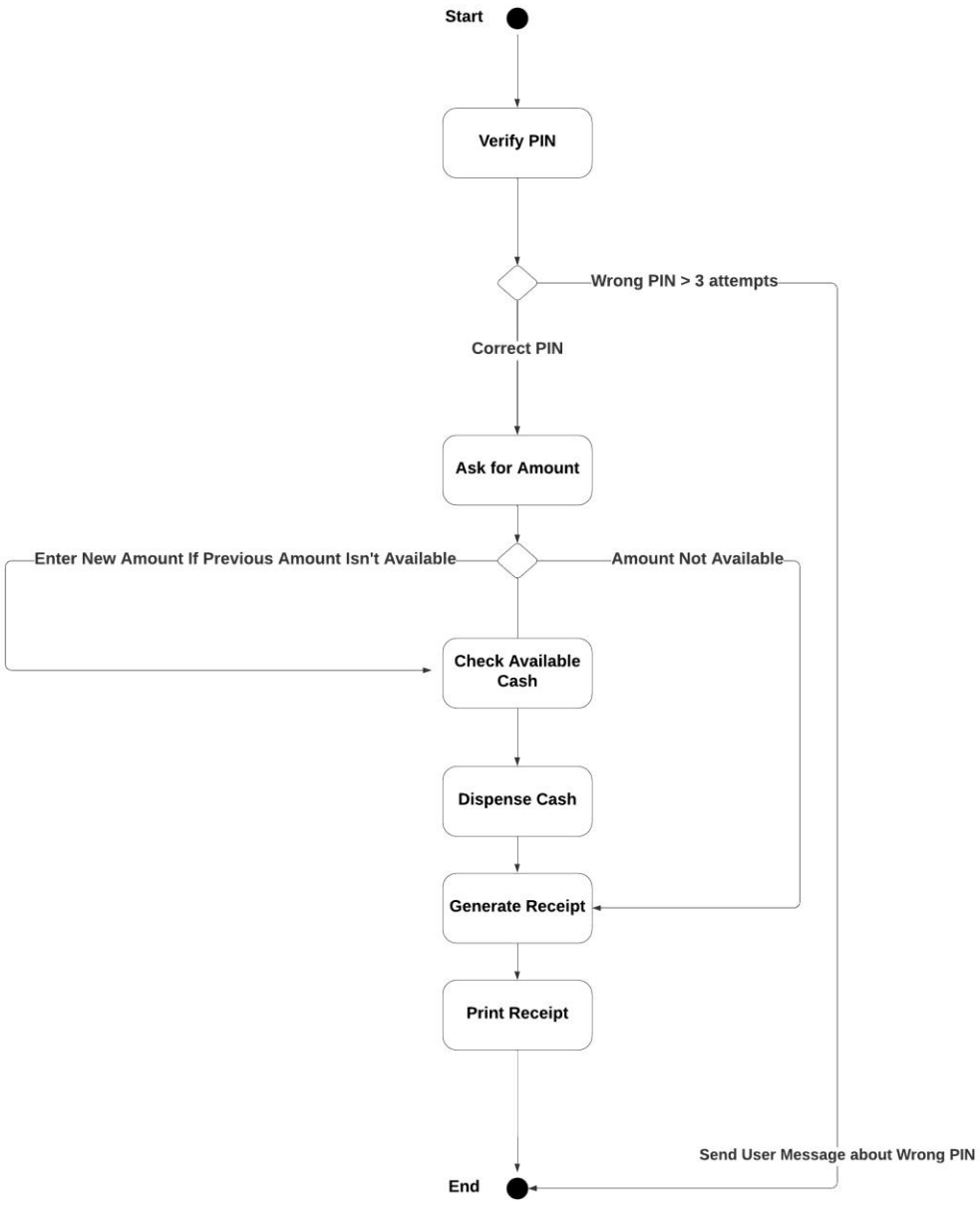
Southern New Hampshire University

CS 255 System Design Document Template

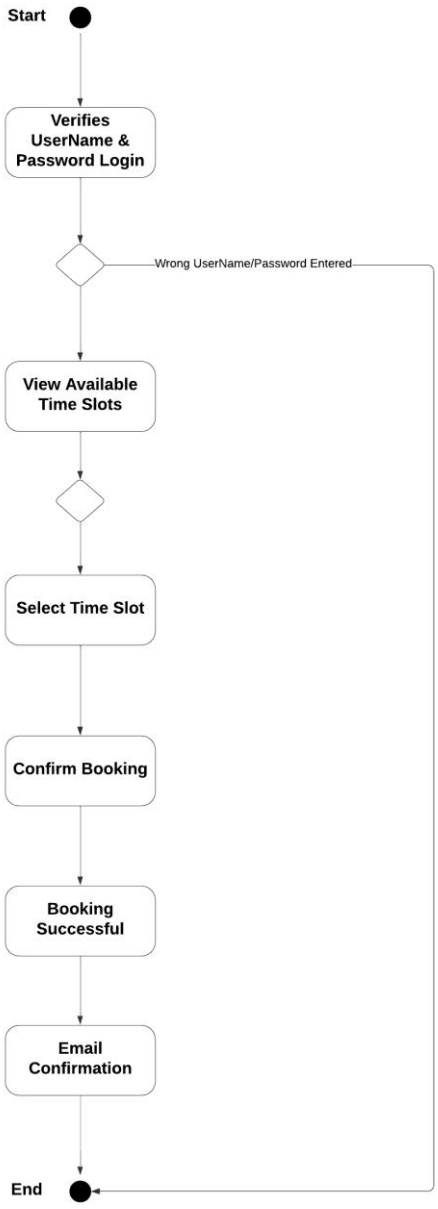
UML Diagrams

UML Use Case Diagram

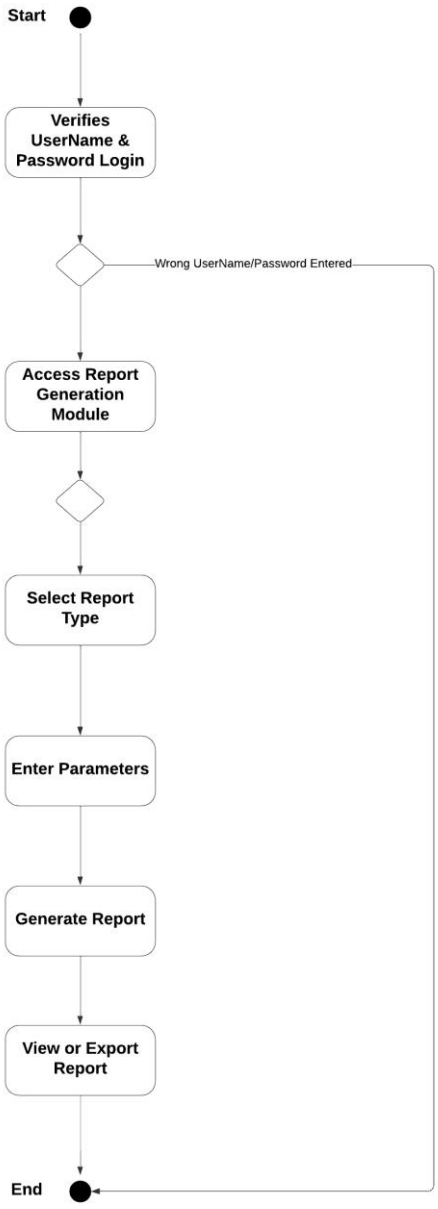


UML Activity Diagrams

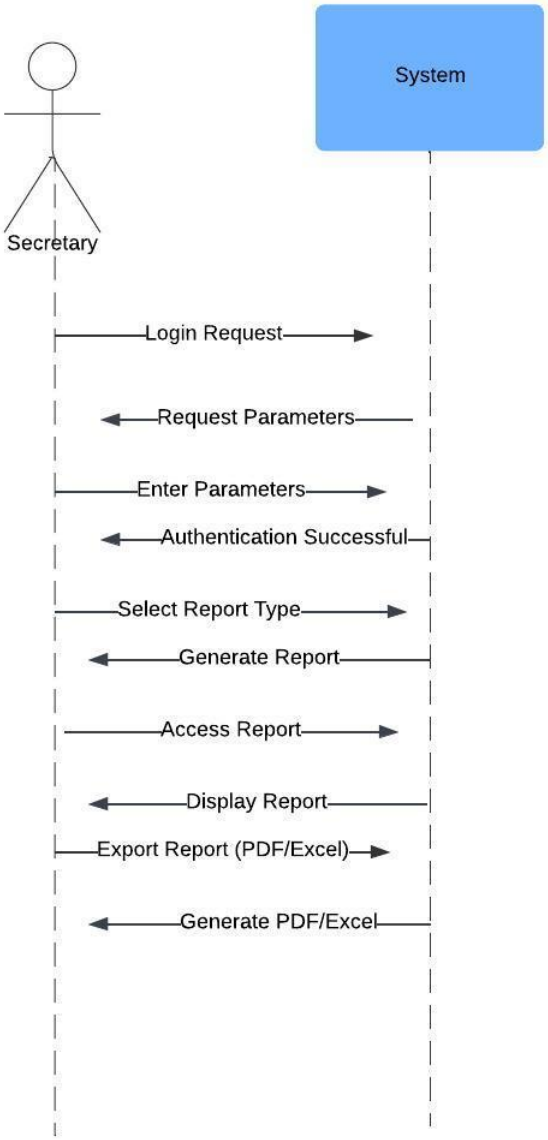
(1) Schedule Driving Lesson (Customer/Student)



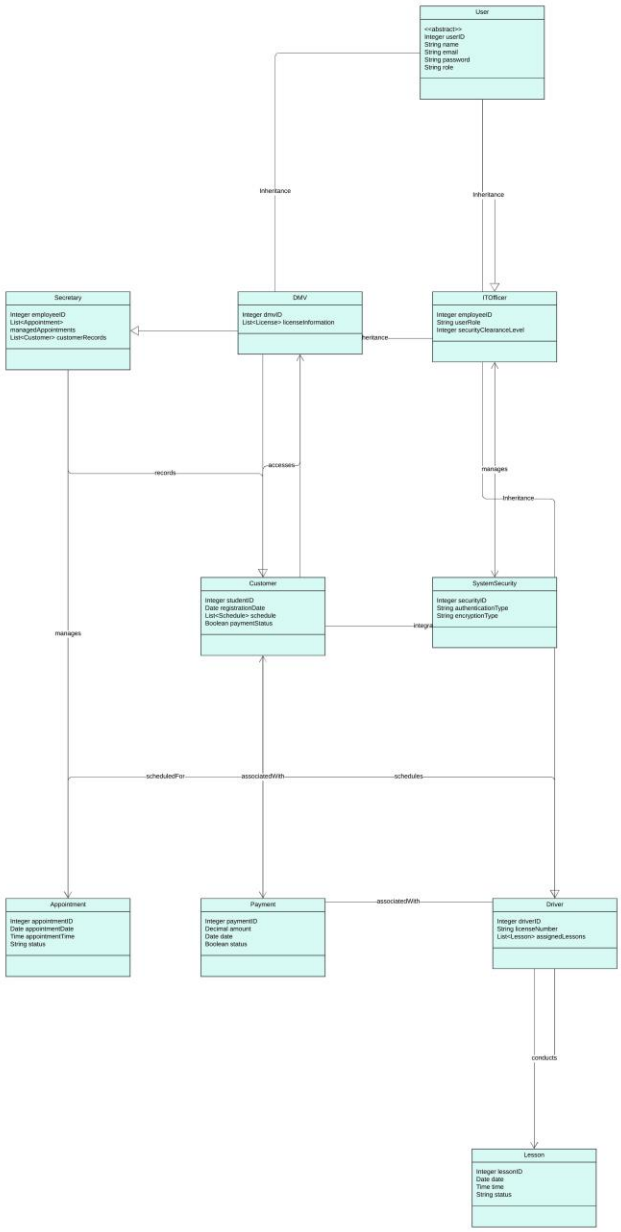
(2) Generate Report (Secretary)



UML Sequence Diagram



UML Class Diagram



Technical Requirements

The **technical requirements** for the system supporting the DriverPass project includes several elements across hardware, software, tools, and infrastructure:

1. Hardware Requirements:

- **Servers:**
  - **Application Server**: To handle the business logic and interactions (reports generation, user authentication, scheduling, etc.).
  - **Database Server**: To store user data, reports, schedules, and other system information.

- **Backup Server**: To maintain data redundancy and disaster recovery.

- **End-user Devices:**
  - Devices like desktop computers, laptops, or mobile devices that users (Secretary, Customer, Drivers, IT Officers) will use to interact with the system.

- **Network Infrastructure:**
  - **Secure network connections** (such as VPN or encrypted connections) to support safe access to the system.

2. Software Requirements:

- **Operating Systems**:
  - The system should be compatible with major operating systems such as **Windows**, **Linux**, and **macOS**.

- **Database Management System (DBMS)**:
  - A reliable DBMS like **MySQL**, **PostgreSQL**, or **Oracle** to store and manage data.

- **Web Server**:
  - The system should use a web server like **Apache** or **Nginx** to serve web-based interfaces and support requests.

- **Application Framework**:
  - A robust backend framework such as **Java Spring**, **Django** (Python), or **Node.js** to manage application logic.

- **Authentication and Security Tools**:
  - **OAuth** or **LDAP** for secure login and role-based access.
  - **SSL/TLS** encryption for secure communication between users and the system.

- **PDF/Excel Export Libraries**:
  - Tools like **Apache POI** for Excel export and **iText** for PDF generation.

- **Logging & Monitoring**:
  - Use tools like **Splunk** or **Elasticsearch** for system performance monitoring, logging user actions, and identifying issues.

3. Tools:

- **Integrated Development Environment (IDE):**
  - Tools like **Eclipse**, **Visual Studio Code**, or **IntelliJ** for development.

- **Version Control System**:
  - **Git** for source code management and collaboration between developers.

- **CASE Tools**:
  - Use **Lucidchart** or **Microsoft Visio** to create and maintain UML diagrams such as sequence and activity diagrams.

- **Testing Tools**:
  - Automated testing tools like **JUnit** (for Java), **Selenium** (for web UI testing), and **Postman** (for API testing).

4. Infrastructure Requirements:

- **Cloud Infrastructure** (if applicable):
  - Use cloud services such as **AWS**, **Microsoft Azure**, or **Google Cloud Platform** for hosting, scalability, and distributed systems management.

- **Load Balancing and Scalability**:
  - Ensure scalability by deploying load balancers (e.g., **HAProxy**) and auto-scaling mechanisms to handle increasing user traffic or data.

- **Backup and Recovery Systems**:
  - Regular automated backups and disaster recovery plans should be in place for the system's data and infrastructure.

5. Security Requirements:

- **Authentication & Authorization**:
  - Use multi-factor authentication (MFA) for sensitive roles like IT Officers and Administrators.
  - Role-based access control (RBAC) to ensure appropriate access rights for different users (e.g., Students, Secretary, IT Officer).

- **Encryption**:
  - Data should be encrypted both at rest and in transit to safeguard sensitive information, such as customer data and reports.

- **Audit Logging**:
  - Implement detailed logging and audit trails to track system access and modifications.

This infrastructure ensures the system can perform DriverPass' requirements efficiently while also maintaining data security, handling future growth, and providing a seamless user experience across the various actors in the system (Customer, Secretary, IT Officer, Drivers, and DMV).