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Summative Assessment 1: Systems Analysis and Design

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System Development Life Cycle for the Local Elderly Care Centre App

Investigation Phase

- Why is the system being designed?
- The system looks to better the quality of elderly care by providing caregivers with optimised management tools for scheduling, medication tracking, wellness activities and real-time health monitoring via wearable devices. It also supervises the family involvement aspect and ensures timely alerts for vital health events.

- Who will be using the system?
- Primary users include caregivers at the elderly care centre, elderly residents and family members. Secondary users may include the healthcare professionals and administrative staff.

- What capabilities will the system provide?
- The system will allow for elderly care management, appointment scheduling, medication tracking, integration with wearable health devices, real-time alerts for critical health events and family access for monitoring.

Feasibility Study

- Statement of the Problem:
- Elderly residents often need constant health monitoring and coordinated care, which is challenging with manual processes and is limited real-time data access. This allows for a delayed response to health emergencies and insufficient management.

- Preliminary Investigation and Summary of Findings:
- Paper-based systems and Manual record-keeping methods are insufficient and are prone to errors. Wearable health devices can allow for real-time data but are lacking integration and alert mechanisms. An integrated digital system can improve responsiveness and coordination.

Timeline/Gantt Chart:

Phase	Duration	Start Date	End Date
Requirements Gathering	2 weeks	01/02/2025	14/02/2025
System Design	3 weeks	15/02/2025	07/03/2025
Development & Testing	6 weeks	08/03/2025	18/04/2025
Deployment & Training	2 weeks	19/04/2025	02/05/2025

Analysis Phase

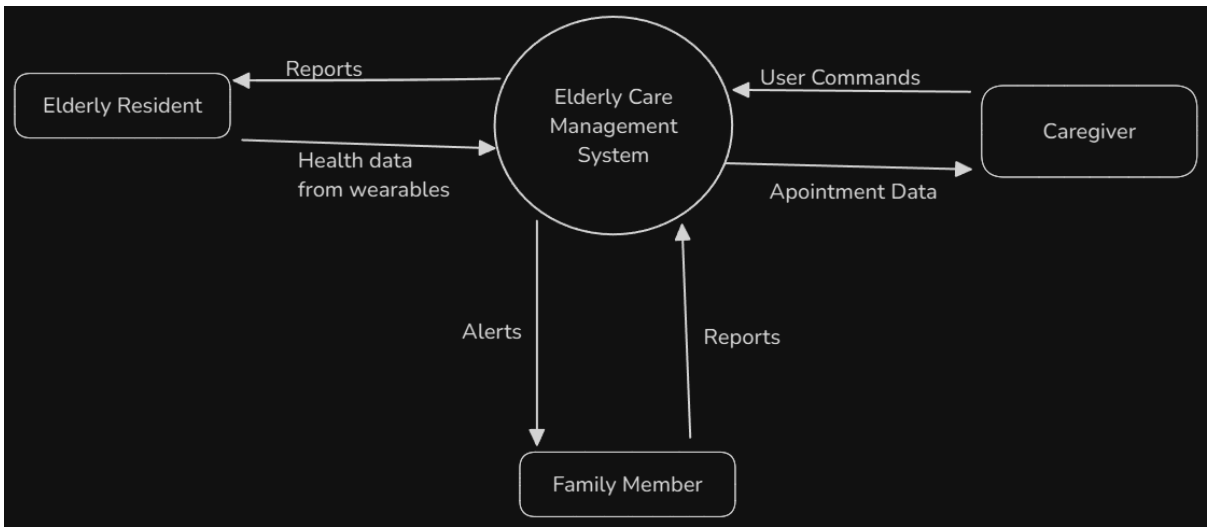
- Procedure for collecting data:
- Interviews with caregivers, elderly residents, and family members.
- Observation of current workflows.
- Review of existing health records and device data logs.

- Defining System Requirements:
- User authentication for caregivers, residents, and family members.
- Scheduling module for appointments and wellness activities.
- Medication management with reminder alerts.
- Integration with wearable health devices (heart rate, blood pressure, oxygen levels).
- Real-time alerts for abnormal health metrics.
- Dashboard for health data visualization.
- Secure access for family members to monitor elderly residents.

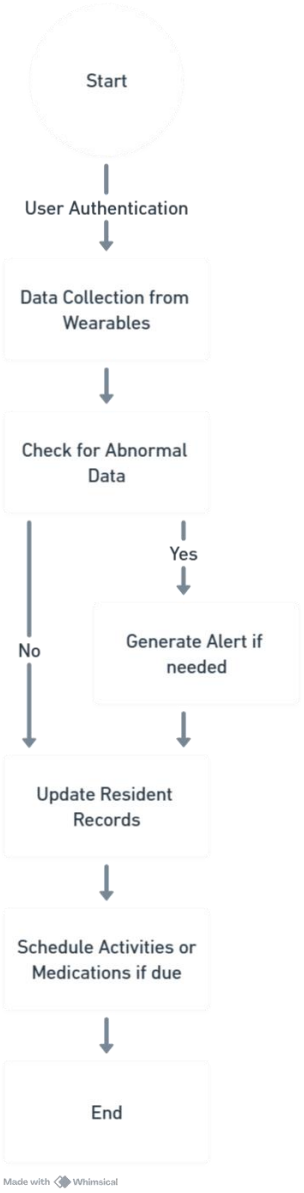
- Prioritization of Requirements:
- High Priority: Real-time health monitoring, alerts, caregiver management.
- Medium Priority: Scheduling and medication management.
- Low Priority: Advanced analytics and reporting.

Design Phase

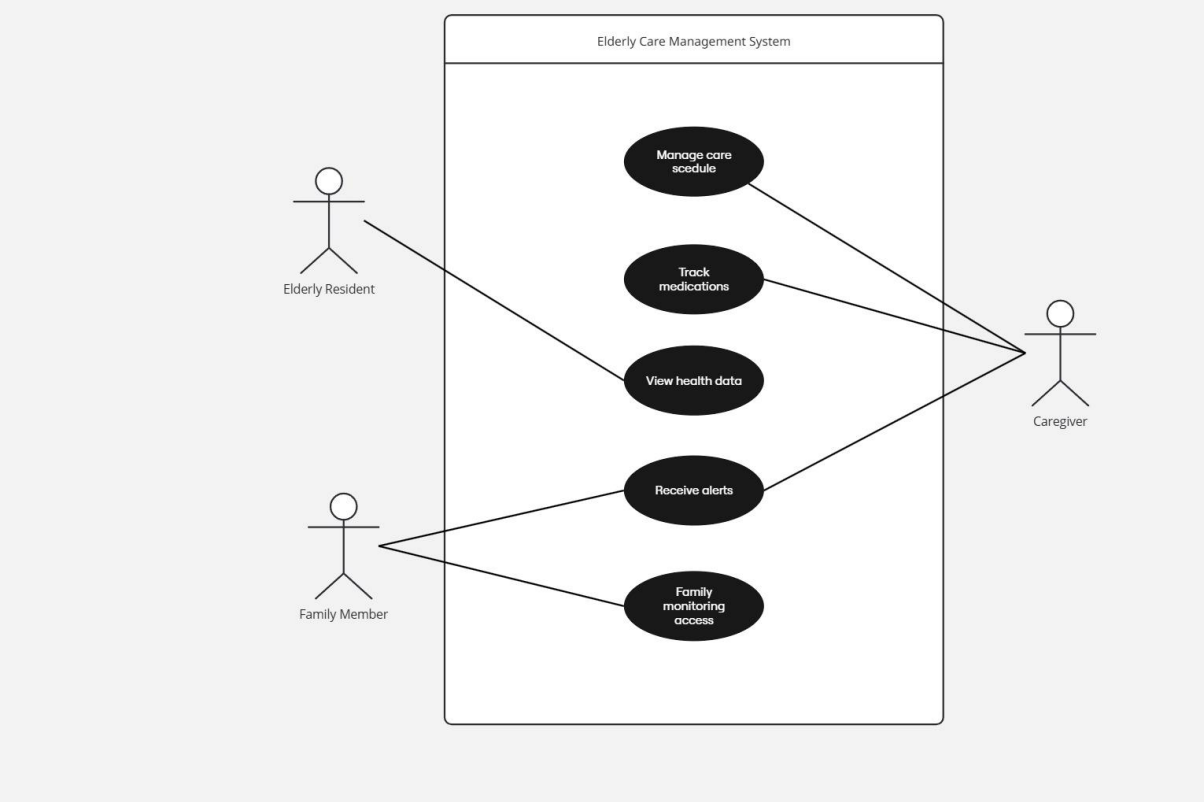
Context Diagram:



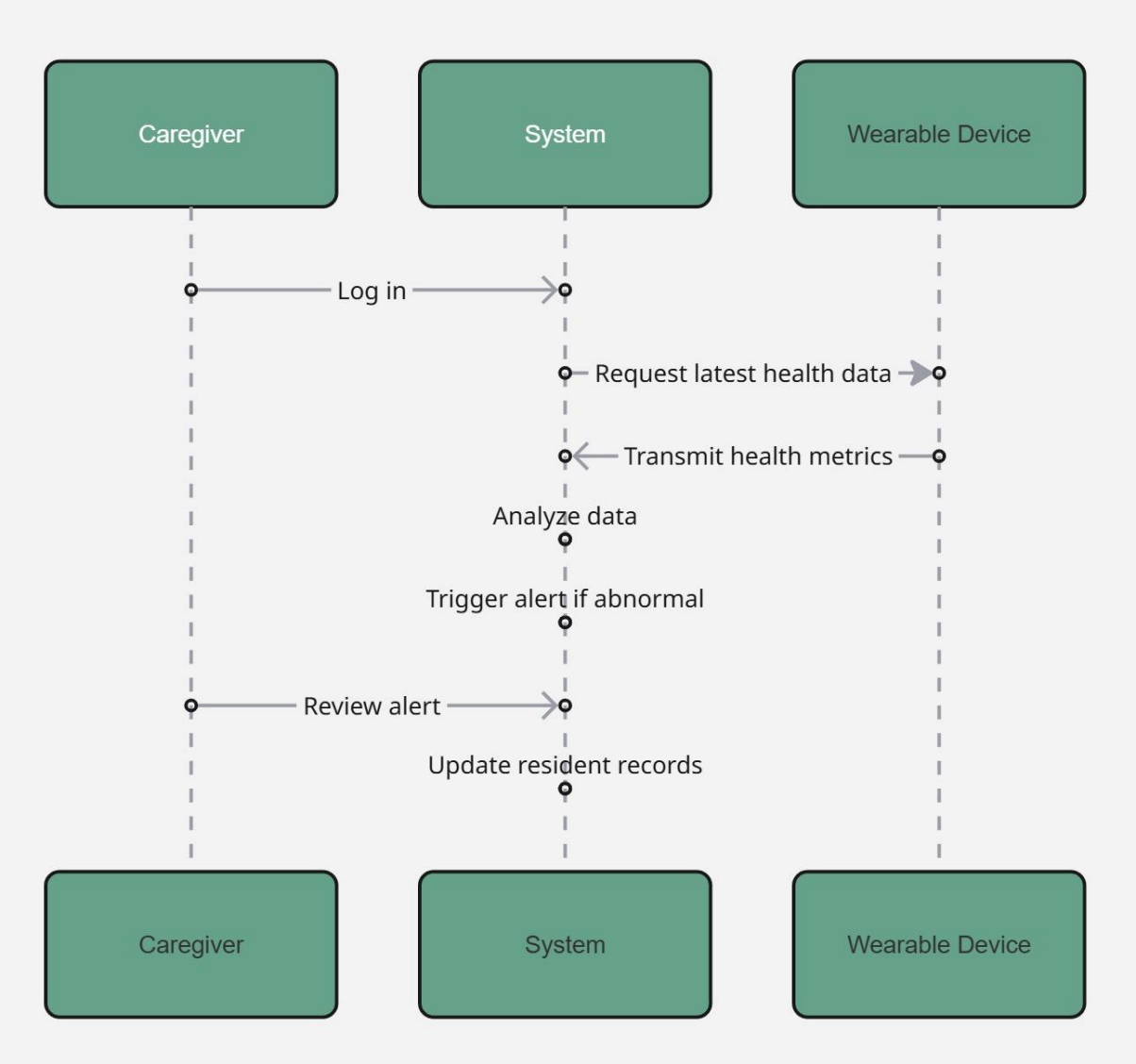
Flow Chart:


Start
User Authentication
Data Collection from Wearables
Check for Abnormal Data
Yes
No
Generate Alert if needed
Update Resident Records
Schedule Activities or Medications if due
End
Made with Whimsical

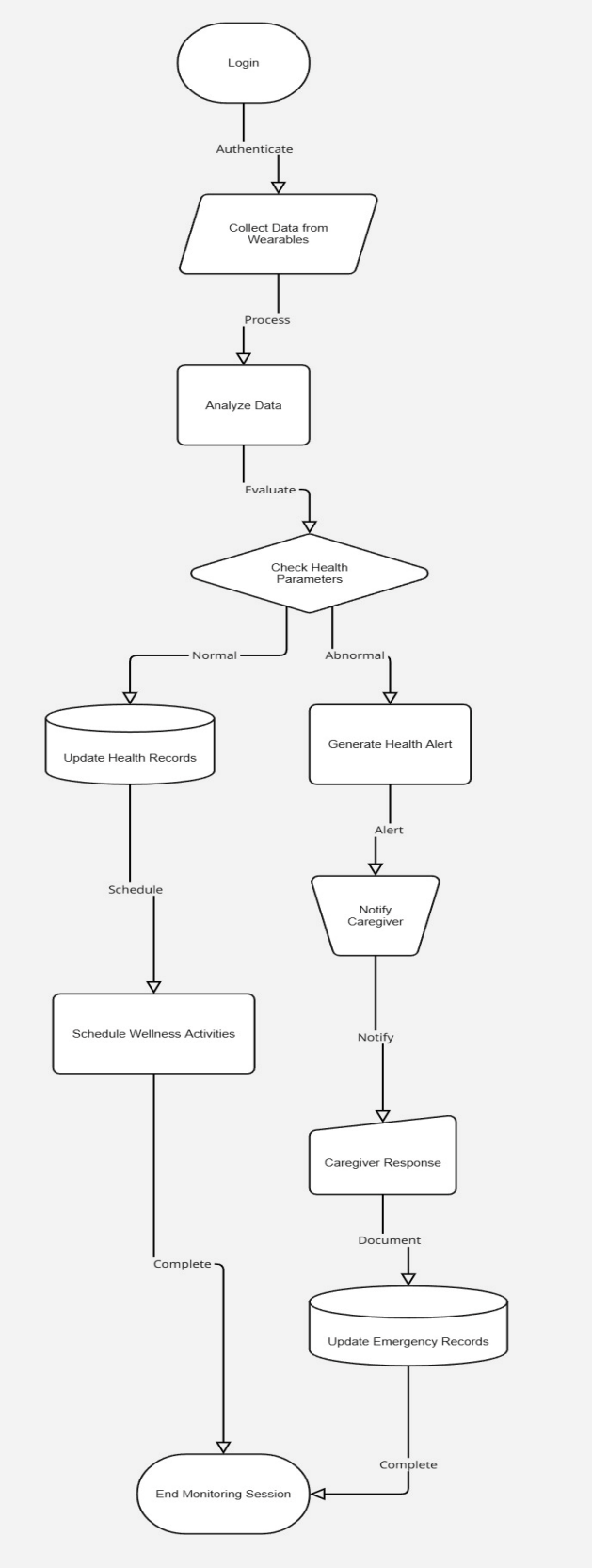
Use Case Diagram:



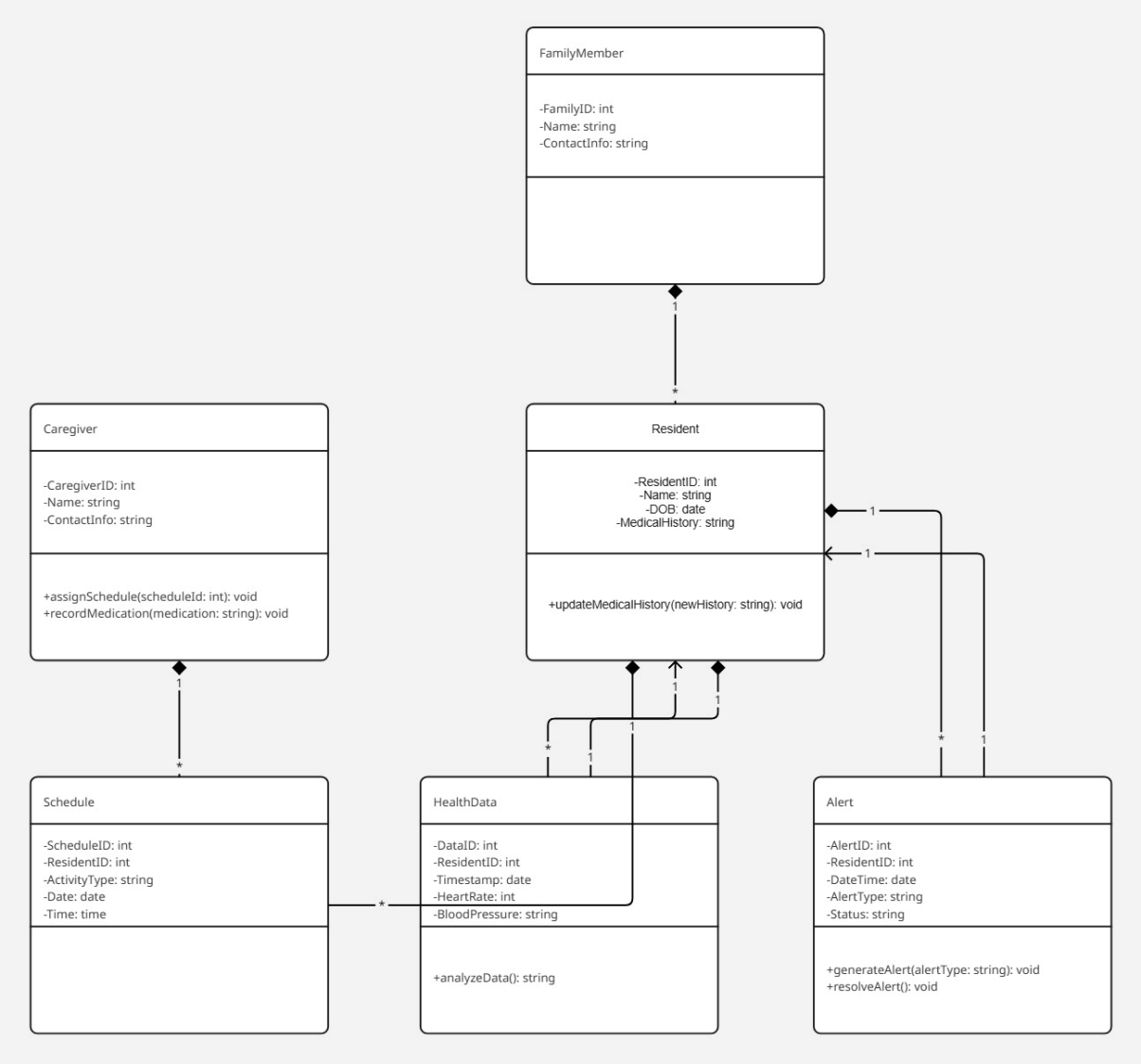
Sequence Diagram:



Activity Diagram:



Class Diagram:



- UI Design:

- Home screen with various login options for caregiver, resident and family.
- Dashboard showing health metrics, alerts, and schedules.
- Data entry methods for medication and activity management.
- Notification panel for alerts.

- Design Considerations:

- Simple, intuitive navigation for elderly users.
- Secure login with multi-factor authentication.
- Responsive interface for various devices and operating systems.

Implementation Phase

Technology:

- Frontend - React.js for responsive and dynamic user interfaces.
- Backend - Node.js with Express.js for the server-side logics.
- Database – MySQL or MongoDB for flexible data storage.
- Wearable Device Integration - RESTful APIs for device data tracking.
- Security - OAuth 2.0 for authentication, SSL/TLS for data transmission.
- Alerts & Notifications - Firebase Cloud Messaging for real-time alerts.
- Hosting - Cloud services like AWS or Azure for scalability when needed.

Summary:

This well-structured SDLC plan allows for the development of an effective, secure and user-friendly elderly care management system that uses modern technologies and integrates real-time health monitoring to improve elderly residents' well-being and family involvement.