UML State Machine Diagram
COMP 3004 Final Project
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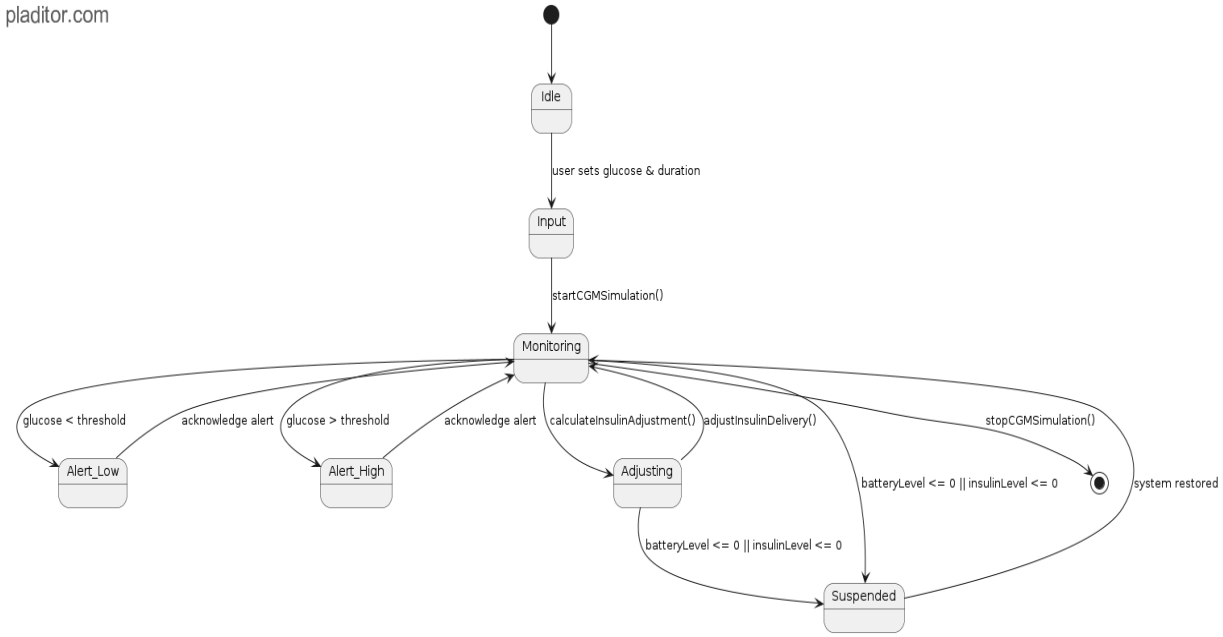
CGM State Machine Diagram:
The Continuous Glucose Monitoring (CGM) system begins in the Idle state, where the user inputs the initial glucose level and simulation duration. After starting the simulation via startCGMSimulation(), the system transitions to the monitoring state, where glucose values are continuously simulated. If a glucose reading drops below the defined threshold, the system enters the Alert_Low state; if it rises above, it transitions to Alert_High. In either case, user acknowledgment is required before returning to Monitoring. If glucose levels require intervention, the system calls calculateInsulinAdjustment() and transitions to Adjusting. After delivering insulin via adjustInsulinDelivery(), it returns to monitoring. If a critical condition arises (e.g., battery level ≤ 0 or insulin is depleted), the system transitions to the Suspended state. Once the issue is resolved, the system resumes monitoring. The simulation continues until the user explicitly stops it using stopCGMSimulation(), leading to the final state.



Manual Bolus Delivery State Machine Diagram:
The manual bolus delivery process begins in the Idle state. When the user initiates a manual bolus, the system transitions to the calculating state where insulin dosage is computed using entered inputs and profile values. The system then moves to the Confirming state, where the calculated dose is presented to the user. The user can either confirm (transitioning to Delivering) or cancel (transitioning to Cancelled). Upon confirmation, the system delivers the immediate bolus in the ImmediateDelivery state. If an extended bolus is also selected, the system enters ExtendedScheduled to prepare the dose and then moves into DeliveringExtended for scheduled delivery over time. The process can be completed successfully (Delivered), be interrupted by a user-initiated cancellation (Cancelled), or be

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suspended due to a critical condition like low battery or empty insulin. If suspended, the system transitions to Suspended, halting delivery. Once the issue is resolved (recharge/refill), it returns to the idle state, ready for a new bolus request.