

# COMP 3004 - Team Project

By: Daniel, Se Won, Ashwin, Hendry, Teja

## Schedule:

March 15th	Github setup
March 18th	Design Documentation
Apr 8th	Dumb GUI (No functionality) <ul style="list-style-type: none"><li>- Homescreen (should be able to access bolus and options)</li><li>- Bolus (dummy data)</li><li>- Options</li><li>- Logging (functional)</li></ul>
April 11th	Logic for single profile Reading data from hardware components. UI Interactions Control IQ technology
April 14th	Graphs, Configurable Profiles Complete, Error Handling
April 16th	Feature Complete, Traceability Matrix
Apr 20th	Due date, submit assignment

## Team Responsibilities:

### Design Documentation:

- **Use Cases:** Teja
- **UML Class Diagram:** Daniel
- **UML Sequence Diagrams:**
  - *Normal:* SeWon
    - Starting pump and administering insulin
    - Set personal profile
    - Manual bolus delivery
  - *Safety:* Ashwin
    - Low insulin before starting pump
    - CGM disconnected during pumping
- **UML State Machine Diagrams:** Hendry

## **Dumb GUI (No functionality)**

1. **Home** Screen: Hendry
  - a. Also external toggles like USB, power button, bolus button
2. **Bolus**: Se Won & Daniel
3. **Options** -> adding profiles and changing data within the profiles: Teja & Ashwin

**Logic For Single Profile**: Teja & Ashwin

**Reading data from hardware components**: Hendry

**UI Interactions**: ALL

**Logging(log screen)**: Se Won

- Log class with functions to send/retrieve logs. Handles exporting logs to file for historical data

**Control IQ technology**: Daniel

**Graphs**: Daniel

**Configurable Profiles Complete**: Ashwin

- Give users the option to alter their profile or other profiles on the device.

**Error Handling**:

Hendry (non-pumping related errors)

Se Won, Teja (errors during pumping)

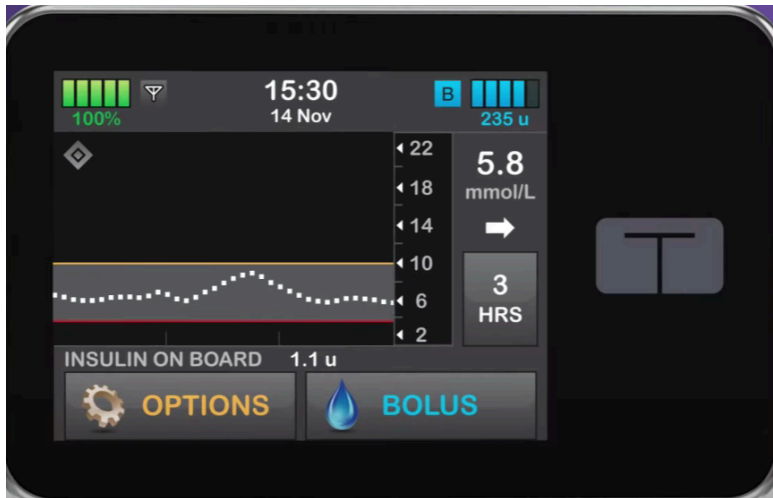
**Traceability Matrix**: ALL (while they are working on their own parts)

# Requirements:

## Project UI:

- Hardware (device)
- Software (Screen)
- These two are contained within group boxes within the QT GUI editor

## Home Screen



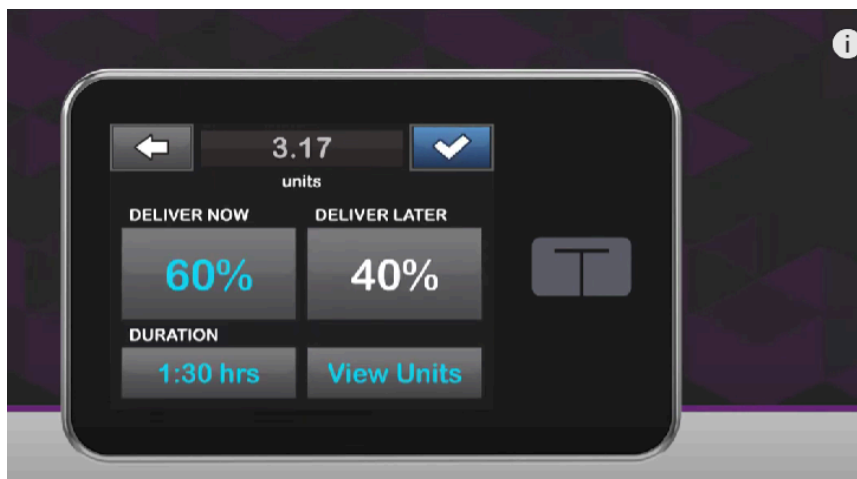
- *Monitor Insulin Delivery* (Upper Right Corner)
  - Remaining Insulin in 300-unit cartridge
  - Insulin active in body after previous bolus injections
- *Monitor Battery Life* (Upper left corner)
- *Continuous Glucose Monitoring* (CGM)
- *Navigation Buttons*
  - Bolus button
    - Directs to bolus calculator
  - Options button
    - Insulin delivery settings
- *Home button*

## Options Menu (Insulin Delivery Settings)



- Manage personal profiles (CRUD access)
  - a. Name
  - b. Basal rate
  - c. Carb ratios
  - d. Correction factors
  - e. Target glucose levels
-

## Bolus Calculator:



- Input boxes (Automatically populate input boxes when opening “bolus” from home screen and can be changed manually)
  - Carbohydrate intake
  - Current blood glucose
- Calculator suggests appropriate dose based on programmed settings (insulin sensitivity, target glucose levels)
- User can adjust dosage and delivery time
  - Quick delivery for immediate correction of high glucose
- User can cancel or stop bolus delivery if needed

## LOGGING:

The system logs information such as

1. basal rates,

2. bolus injections
3. insulin duration
4. correction factors
5. *Common issues such as low battery, low insulin, or CGM disconnection trigger alerts*

## **Classes**

1. Profile (class)
2. MainWindow (class)
  - a. QStackedWidget
    - i. BolusUI
    - ii. HomeUI
    - iii. OptionsUI
  - b. Profiles (vector containing Profile)
3. ControllQ (static class)
4. Logger (static class)
  - a. getLogs (function)
  - b. addLog (function)
  - c. saveLog (function)
5. Bolus (static class)