Traceability Matrix

ID	Requirement	Related Use Case	Fulfilled by	Test	Description	Implemented by	Tested by
1	Power ON/OFF with secure PIN entry	UC1	main.cpp	PumpSimulatorMainWidget::onPowerToggled()	User sets PIN on first power-on; verifies PIN on subsequent power-ons; powers off to hide UI.	Shirley Huang	- Whole Group
2	Home screen with pump status and CGM graph	UC2	main.cpp	HomeScreenWidget constructor + updateStatus()	Shows battery, insulin, IOB, and CGM graph; visible after successful login.	Shirley Huang	- Whole Group
3	Create, update, and delete personal insulin profiles	UC3	main.cpp	ProfileManager, onCreateProfile, onEditProfile	Users can create/update/delete profiles with basal, carb ratio, etc.	Shirley Huang	- Whole Group
4	Manual bolus administration based on user input or CGM	UC4	main.cpp	BolusCalculationDialog, BolusManager::computeFinalBolus()	User enters carbs/BG manually or uses CGM; bolus is calculated using formula.	Niket Rathod	- Whole Group
5	Extended bolus delivery over time	UC5	main.cpp	BolusManager::computeExtendedBolus(), QTimer loop	Splits dose into immediate and extended parts, logs each tick over duration.	Gloria Li	- Whole Group
6	Start/Stop/Resume Basal Insulin with ControlIQ adjustments	UC6	main.cpp	BasalManager::startBasalDelivery()	Delivers basal insulin at profile rate; adjusts rate via ControlIQ; pauses if CGM < 3.9.	Gloria Li	- Whole Group
7	View insulin delivery history (bolus, basal, errors)	UC7	main.cpp	DataManager, addLog(), updateHistory()	Each event is logged with a timestamp; viewable from the History screen.	Niket Rathod	- Whole Group
8	Display real-time graphed glucose data	UC8	main.cpp	HomeScreenWidget::updateGraph()	Shows glucose history and predictions using Qt Charts.	Alex Bon	- Whole Group
9	Handle pump errors (low battery, CGM disconnect, occlusion)	UC9	main.cpp	BasalManager, error buttons in HomeScreenWidget	Alerts user and halts delivery if sensor disconnect or occlusion is detected.	Niket Rathod	- Whole Group
10	Adjust insulin delivery using ControlIQ	UC10	main.cpp	ControlIQ::adjustDelivery(), used in BasalManager	Dynamically changes basal rate depending on CGM value.	Alex Bon	- Whole Group
11	Navigate between screens (Home, Options, History, Bolus)	UC11	main.cpp	NavigationManager::navigateTo()	Controlled via QStackedWidget; user can move between all views.	Shirley Huang	- Whole Group
12	Battery charging	UC12	main.cpp	onCharge(), ChargingDisplayDialog::onTi	Simulates real-time charging; updates battery and UI status.	Gloria Li	- Whole Group

			meout()		