**Course Assignment 1**

**• Derive UC-1 (Unlock) and UC-4 (RetireUser)**

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| **Initiator** | **Initiator’s Goal** | **Participants** | **Use Case Name** |
| Tenant | Bluetooth signal of a user’s phone detected, the door unlocks and the user enters home. | Lock, Household Devices, Database, Phone Bluetooth | Unlock  (UC-1) |
| Landlord | After an existing user account is retired, Bluetooth signal of his/her phone detected, the door still locks. | Database, Phone Bluetooth | RetireUser  (UC-4) |

**• Give the use case schemas of UC-1 and UC-4**

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| **Use Case UC–1:** | **Unlock** |
| **Related Requirements:** | 1. Keep door locked and auto-lock 2. Unlock when valid Bluetooth signal provided 3. Allow mistakes but prevent dictionary attacks 4. Maintain a history log 5. Allow to unlock by a physical key when Bluetooth signal is not available |
| **Initiating Actor:** | Any of: Tenant, Landlord |
| **Actor’s Goal:** | To disarm the lock and enter, and get space lighted up automatically. |
| **Participating Actors:** | Tenant, Landlord |
| **Preconditions:** | * The set of valid Bluetooth signals stored in the system database is non-empty. * Bluetooth signal detection device of the system is working normally. |
| **Postconditions:** | The auto-lock timer has started countdown from autoLockInterval. |
| **Flow of Events for Main Success Scenario:** | |
| 🡪 | Tenant/Landlord arrives at the door and turn on the Bluetooth signal of his/her phone |
| include::*AuthenticateUser* ( UC-7 ) | |
| 🡨 | System signals to LockDevice to disarm the lock and signals to LiaghtSwitch to turn the light on |
| 🡨 | System signals to the Timer to start the auto-lock timer countdown. |
| 🡪 | Tenant/Landlord opens the door, enters the home [and shuts the door and locks] |

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| **Use Case UC–4:** | **RemoveUser** |
| **Related Requirements:** | Removing users at runtime |
| **Initiating Actor:** | Landlord |
| **Actor’s Goal:** | To remove departed residents at runtime. |
| **Participating Actors:** | Tenant, Landlord |
| **Preconditions:** | * The set of valid Bluetooth signals stored in the system database is non-empty. * The system displays the menu of available functions; at the door keypad the menu choices are “Add” and “Remove”. |
| **Postconditions:** | The user whose account is removed can’t unlock the door. |
| **Flow of Events for Main Success Scenario:** | |
| 🡪 | Landlord selects the menu item “ManageUsers” |
| Landlord identification: Include Login (UC-8) | |
| 🡨 | System displays the options of activities available to the Landlord (including “Add User” and “Remove User”)  and prompts the Landlord to make selection |
| 🡪 | Landlord selects the activity, such as “Remove User,” and deletes the data |
| 🡨 | System deletes the data from the storage, and signals completion |

**• Give the acceptance tests for UC-1 and UC-4**

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| **Test-case Identifier:** | **TC-1** |
| **Use Case Tested:** | UC-1 |
| **Pass/fail Criteria:** | The test passes if the Bluetooth signal of the phone is contained in the database, with less than a maximum allowed number of unsuccessful attempts |
| **Input Data:** | Bluetooth signal of a phone, door identifier |
| **Test Procedure:** | **Expected Result:** |
| Step 1. Send an incorrect Bluetooth signal and type in a valid door identifier | System beeps to indicate failure;  records unsuccessful attempt in the database;  prompts the user to try again |
| Step 2. Send a correct Bluetooth signal and type in a valid door identifier | System flashes a green light to indicate success;  records successful access in the database;  disarms the lock device |

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| **Test-case Identifier:** | **TC-4** |
| **Use Case Tested:** | UC-4 |
| **Pass/fail Criteria:** | The test passes if the user whose account is removed fails to unlock the door by the Bluetooth signal of his/her phone, it is deemed to be successful |
| **Input Data:** | Bluetooth signal of a phone, door identifier |
| **Test Procedure:** | **Expected Result:** |
| Step 1. Send a Bluetooth signal removed from the database and type in a valid door identifier | System beeps to indicate failure;  records unsuccessful attempt in the database;  prompts the signal not existed in the database |
| Step 2. Send a Bluetooth signal existing in database and type in a valid door identifier | System flashes a green light to indicate success;  records successful access in the database;  disarms the lock device |