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| --- | --- | --- | --- |
| Initiator | Initiator’s goal | Participants | Use Case Name |
| Tenant | Unlock and enter home | Lock, Household Device, Database, Mobile Phone | Unlock(UC-1) |
| Landlord | Retire an existing user phone number and disable access. | Database  Mobile Phone | Retire User(UC-4) |

**Use case**

**Schema for Detailed Use Cases:**

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| --- | --- | --- |
| **Use Case UC-1:** | | **Name / Identifier [verb phrase]** |
| Related Requirements: | | •Keep door locked and auto-lock  •Unlock the door when tenants approach  •Maintain a history log |
| Initiating Actor: | | Any of: Tenant, Landlord |
| Actor’s Goal: | | To disarm the lock and enter, and get space lighted up automatically. |
| Participating Actors: | | LockDevice, LightSwitch, Timer, MobilePhone |
| Preconditions: | | • The set of valid phone number stored in the system database is non-empty. |
| Postconditions: | | The auto-lock timer has started countdown from autoLockInterval. |
| **Flow of Events for Main Success Scenario:** | | |
| → | 1.Tenant/Landlord arrives at the door and blue teeth find the signal. | |
| 2. include::AuthenticateUser | |
| ← | 3.System  (a) signals to the Tenant/Landlord the lock status, e.g., “disarmed,”  (b) signals to LockDevice to disarm the lock, and  (c) signals to LightSwitch to turn the light on | |
| ← | 4. System signals to the Timer to start the auto-lock timer countdown | |
| → | 5. Tenant/Landlord opens the door, enters the home [and shuts the door and locks] | |

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| **Use Case UC-4:** | | **Name / Identifier [verb phrase]** |
| Related Requirements: | | • Retire an existing user phone number  • disable access if the phone number isn’t in the database |
| Initiating Actor: | | Landlord |
| Actor’s Goal: | | To remove departed residents at runtime.. |
| Participating Actors: | | LockDevice, MobilePhone |
| Preconditions: | | Landlord has the ability to rewrite the database |
| Postconditions: | | The modified data is stored into the database |
| **Flow of Events for Main Success Scenario:** | | |
| → | 1. Landlord selects the menu item “ManageUsers” on his/her mobile phone  2. Landlord identification: Include Login (UC-8) | |
| ← | 3. System  (a) displays the options of activities available to the Landlord (including “Add User” and “Remove User”)  (b) prompts the Landlord to make selection | |
| → | 4. Landlord selects the activity, such as “Remove User,” and delete the chosen data | |
| ← | 5. System (a) delete the data on a persistent storage, and (b) signals completion | |

**Acceptance Test Case**

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| --- | --- | --- |
| Test-case Identifier | TC-1 | |
| Use Case Tested | UC-1, main success scenario | |
| Pass/fail Criteria | The test passes if a phone with correct phone number approach the door and the door unlock. | |
| Input data | The signal that phone use blue teeth send to the LockDevice | |
| Test procedure: | | Expected Result: |
| Step 1: Approach the door with a phone whose phone number isn’t in the database | | System is not responding |
| Step 2: Approach the door with a phone whose phone number is in the database | | * 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-2 | |
| Use Case Tested | UC-4, | |
| Pass/fail Criteria | The test passes if landlord use his mobile phone to remove a phone number and corresponding phone is invalid to unlock the door. | |
| Test procedure: | | Expected Result: |
| Step 1: landlord remove a phone number from database using his/her mobile phone | | The chosen phone number in LockDevice’s database disappear |
| Step 2: Approach the door with a phone whose phone number isn’t in the database | | System is not responding |