Software Engineering Project 17/18

**Luxury Rentals**

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# **Introduction**

Luxury Rentals is designed to allow admins to utilize owners, properties and tenants to save a database of properties owned by owners being rented to tenants. This project is intended on delivering a clear and concise format to deliver and smooth UI for administrators to utilize for their system. The system will use 3 main tables with 4 sub functions for each of them. I intend on developing a fully-embellished project later down the line.

# **Functional Components**

# **User Requirements**

## **Luxury Rentals** **will perform Ownership management**

1.1 Luxury Rentals will add a new owner.

1.2 Luxury Rentals will update a specific owner.

1.3 Luxury Rentals will remove a specific owner.

1.4 Luxury Rentals will list details of a specific owner.

## **Luxury Rentals will perform Property management**

2.1 Luxury Rentals will add a new property.

2.2 Luxury Rentals will update a specific property.

2.3 Luxury Rentals will remove a specific property.

2.4 Luxury Rentals will list a specific property.

## **Luxury Rentals will perform Tenant’s management**

3.3 Luxury Rentals will rent a property to a new tenant.

3.2 Luxury Rentals will update a specific tenant.

3.4 Luxury Rentals will remove a specific tenant.

3.1 Luxury Rentals will list details of a specific tenant.

## **Luxury Rentals will perform Administration analysis**

4.1 Luxury Rentals will calculate the total of renting for specific tenants

# **System Requirements**

Include a brief overview of the system requirements.

Your hierarchy chart / User requirements summarise these……..

|  |  |  |
| --- | --- | --- |
| **Functional**  **Requirements** | **Non-Functional Requirements** | **Domain**  **Requirements** |
| 1. To give the manager the option of adding, updating, removing and querying owners.  2. To give the landlord the option of adding, updating, removing and querying properties.  3. To give the sales agent the option of adding, updating, removing and querying tenants.  4. To maintain a log of the changing of relations between tenants and properties along with the relationship between properties and owners.  5. To calculate the sum of rent for properties for a month for a certain location. | 1. The system must be accurate to the correct details. The relationships between the files must be maintained.  2. System must be easy to use for the different users so the design will be simplistic.  3. The system will be secure. Each separate will have their own unique login and password for the system. | 1. As the information in the software is highly sensitive, the software will not contain online capabilities but the manager, sales agent and landlord can access the software from the sales office. |

## **System Level Use Case Diagram**

SYSTEM

Applicant

Manager

User

## **Manage Owners**

This set of functions allows a manager to input, edit and query necessary information regarding owners that they might need within their system.

### **Add Owner**

This function records an owners details on the system. An owner is identified by an Owner\_ID.

Activity Diagram: Add Owner

Manager System

Invokes Add Owner

Assign Owner ID

Display UI

Enter Data

Reset UI

Display Confirmation Message

Continue

Save Owner Details

Save Owner Details

Error Message

Valid?

Validate Data

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Add Owner** | |
| **Use Case Id** | 4.1.1 | |
| **Priority** | Medium | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Owner | |
| **Description** | This function records an owner’s details on the system. | |
| **Preconditions** | All owners must be verified beforehand to be on the list of owners. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the Add Owner function.  **Step 4:** Manager enters the required data:   * Forename * Surname * Address Line 1 * Address Line 2 * County * Phone * Email   **Step 5:** Manager clicks the ‘Add Owner’ button | **Step 2:** The system assigns the next Owner ID.  **Step 3:** System displays the UI  **Step 6:** System validates the data:   * All fields must be entered * Forename must be letters only * Surname must be letters only * Address line 1 must be letters and numbers only * Address line 2 must be letters only * County must be letters only * Phone must be numeric only * Email must be valid format   **Step 7:** System assigns Activity as ‘A’ meaning the Owner is Active  **Step 8:** Save data in Owners File  **Step 9:** Display a confirmation Message  **Step 10:** Reset UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Field not entered:** |  | **Step 6:** A blank field detected  **Step 7**: Display message “This field must be entered”  **Step 8:** Position cursor in offending field and return to step 4 |
| **Non-Letter entered in Forename:** |  | **Step 6:** A non-letter detected  In forename field  **Step 7**: Display message “Forename must be letters only”  **Step 8:** Position cursor in offending field and return to step 4 |
| **Non-Letter entered in Surname:** |  | **Step 6:** A non-letter detected  In surname field  **Step 7**: Display message “Surname must be letters only”  **Step 8:** Position cursor in offending field and return to step 4 |
| **Non-Letter & Non-Number entered in Address Line 1:** |  | **Step 6:** A non-letter detected  In address line 1 field  **Step 7**: Display message “Address Line 1 must be numbers and letters only”  **Step 8:** Position cursor in offending field and return to step 4 |
| **Non-Letter entered in Address Line 2:** |  | **Step 6:** A non-letter detected  In address line 2 field  **Step 7**: Display message “Address Line 2 must be letters only”  **Step 8:** Position cursor in offending field and return to step 4 |
| **Non-Letter entered in County:** |  | **Step 6:** A non-letter detected  In county field  **Step 7**: Display message “County must be letters only”  **Step 8:** Position cursor in offending field and return to step 4 |
| **Non-numeric entered in phone:** |  | **Step 6:** A non-numeric detected in phone field  **Step 7:** Display message “The field must be all numeric characters”  **Step 8:** Position cursor in offending field and return to step 4 |
| **Email address had invalid format:** |  | **Step 6**: An invalid format entered for email  **Step 7:** Display message “Email format invalid”  **Step 8:** Position cursor in Email field and return to step 4 |
| **Conclusions** | The valid owner has been added to the list of owners. | |
| **Post conditions** | This owner is now able to own properties from the properties file. | |
| **Business Rules** | The owner must have a valid email address. | |
| **Implementation Constraints** |  | |

### **Update Owner**

This function updates an owner’s details on the system. An owner is identified by their OwnerID.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Update Owner** | |
| **Use Case Id** | 4.1.2 | |
| **Priority** | Medium | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Owner | |
| **Description** | This function allows administration to update any specific owners within the owners file. | |
| **Preconditions** | The owner must be verified beforehand to be on the list of owners. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the update owner function.  **Step 3:** Manager enters owner surname (or part of).  **Step 6:** Manager selects owner to update from DataGrid.  **Step 9:** Manager updates owner details:   * Surname * Forename * Street * Town * County * Phone * Email * Activity   **Step 10:** Manager clicks Update Owner button | **Step 2:** Display UI.  **Step 4:** The system checks if the search field was entered.  **Step 5:** The system retrieves a list of all owners with matching surname from the Owners file and displays it on a DataGrid in the UI.  **Step 7:** Systemretrieves all details for the selected owner from the Owners file  **Step 8:** System populates text boxes with the data from the selected object.  **Step 11:** System validates Owner details:   * All fields must be entered * Forename must be letters only * Surname must be letters only * Address Line 1 must be letters only * Address Line 2 must be letters only * County must be letters only * Phone must be numeric only * Email address must have correct format * Activity must be A or I   **Step 12:** Saves updated owner details in Owner File.  **Step 13:** Display Confirmation message  **Step 14:** Clear the UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Field not entered:** |  | **Step 11:** A blank field detected  **Step 12:** Display message “All fields must be entered”  **Step 13:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in Forename:** |  | **Step 11:** A non-letter detected in the forename field  **Step 12:** Display message “Forename must be letters only”  **Step 13:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in Surname:** |  | **Step 11:** A non-letter detected in the surname field  **Step 12:** Display message “Surname must be letters only”  **Step 13:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in Address Line 1:** |  | **Step 11:** A non-letter detected in the Address Line 1 field  **Step 12:** Display message “Address Line 1 must be letters only”  **Step 13:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in Address Line 2:** |  | **Step 11:** A non-letter detected in the Address Line 2 field  **Step 12:** Display message “Address Line 2 must be letters only”  **Step 13:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in County:** |  | **Step 11:** A non-letter detected in the county field  **Step 12:** Display message “County must be letters only”  **Step 13:** Position cursor in offending field and return to step 9 |
| **Non-numeric entered in phone:** |  | **Step 10:** A non-numeric detected in phone field  **Step 11:** Display message “This field must be all numeric characters”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Email address has invalid format:** |  | **Step 10:** An invalid format entered for email  **Step 11:** Display message “This field must have a valid format”  **Step 12:** Position cursor in Email field and return to step 9 |
| **Invalid character entered in Activity:** |  | **Step 10:** A character other than A or I entered in Activity field  **Step 11:** Display message “Activity must be either A or I”  **Step 12:** Position cursor in activity field and return to step 9 |
| **Surname search field not entered:** |  | **Step 4:** A blank field detected  **Step 5:** Display message “A Surname must be entered here”  **Step 6:** Position cursor in offending field and return to step 3 |
| **Conclusions** | The specific owner data has been updated. | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **Remove Owner**

This function allows the user to remove a specific owner from the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Remove Owner** | |
| **Use Case Id** | 4.1.3 | |
| **Priority** | Medium | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Owner | |
| **Description** | This function allows administration to remove any specific owners within the owners file. | |
| **Preconditions** | The owner must be verified beforehand to be on the list of owners. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the remove owner function.  **Step 3:** Manager enters owner surname (or part of)  **Step 7:** Manager selects owner to remove. | **Step 2:** Display UI  **Step 4:** System validates that the field was entered  **Step 5:** Systemretrieves all details for the selected owner from the Owners file  **Step 6:** System populates text boxes with the data from the selected object.  **Step 8:** System sets status for specified Owner as 'I' meaning the Owner is Inactive.  **Step 9:** Display Confirmation message  **Step 10:** Clear the UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Surname search field not entered:** |  | **Step 4:** A blank field detected  **Step 5:** Display message “This field must be entered”  **Step 6:** Position cursor in offending field and return to step 3 |
| **Conclusions** | The selected owner’s status has been set to Inactive | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **Query Owner**

This function will query for a specific owner that is verified and listed on the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Query Owners** | |
| **Use Case Id** | 4.1.4 | |
| **Priority** | Low | |
| **Source** | Manager | |
| **Primary Business Actor** | Manger | |
| **Other Participating Actors** | Owner | |
| **Description** | This function lists all owners on the system. | |
| **Preconditions** | All owners must be verified beforehand to be on the list of owners. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The admin invokes the list all owners function.  **Step 3:** Manager enters owner surname (or part of) | **Step 2:** System displays the UI  **Step 4:** System validates that the field was entered  **Step 5:** The system retrieves a list of all owners with matching surname from the Owners file and displays it on a DataGrid in the UI. |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Surname search field not entered:** |  | **Step 4:** A blank field detected  **Step 5:** Display message “This field must be entered”  **Step 6:** Position cursor in offending field and return to step 3 |
| **Conclusions** | The owner listed is a verified property owner. | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

## **Manage Property**

This set of functions allows a manager to input, edit and query necessary information regarding owners that they might need within their system.

### **Add Properties**

This function allows the manager to allocate new properties to certain properties on the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Add Property** | |
| **Use Case Id** | 4.2.1 | |
| **Priority** | Low | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Owner | |
| **Description** | This function records a properties details on the system. | |
| **Preconditions** | All properties must be verified to be on the list of properties. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the Add Property function.  **Step 3:** Manager enters the surname of the owner they want to add a property to  **Step 6:** Manager selects an Owner from the list of results in the DataGrid.  **Step 10:** Manager enters the required data:   * Rent per month * Bedrooms * Bathrooms * House Type * Street * Town * County | **Step 2:** System displays the UI  **Step 4:** System checks that the surname was entered  **Step 5:** The system retrieves a list of all owners with matching surname from the Owners file and displays it on a DataGrid in the UI.  **Step 7:** Systemretrieves all details for the selected owner from the Owners file and populates text boxes with the data from the selected object.  **Step 8:** The system assigns the next Property ID.  **Step 9:** System displays property fields for the manager to enter  **Step 11:** System validates the data:   * All fields must be entered * Rent per month must be numeric * Bedrooms must be numeric * Bathrooms must be numeric * Bedrooms can’t be greater than 6 * House type must be letters only * Address Line 1 must be letters only * Address Line 2 must be letters only * County must be letters only   **Step 12:** System assigns status ‘A’ to indicate the property is now Active.  **Step 13:** System assigns Owner\_ID to the new property based on the selected owner result.  **Step 14:** Save data in Properties File  **Step 15:** Display a confirmation Message  **Step 16:** Reset UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Surname search field not entered:** |  | **Step 5:** A blank field detected  **Step 6:** Display message “This field must be entered”  **Step 7:** Position cursor in offending field and return to step 3 |
| **Non-numeric entered in Rent per month:** |  | **Step 11:** A non-numeric detected in phone field  **Step 12:** Display message “The field must be all numeric characters”  **Step 13:** Position cursor in offending field and return to step 10 |
| **Field not entered:** |  | **Step 10:** A blank field detected  **Step 11:** Display message “This field must be entered”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Number entered in Bedrooms field:** |  | **Step 10:** A non-numeric detected in bedrooms field  **Step 11:** Display message “Bedrooms must be numbers only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Number greater than 6 entered in Bedrooms field:** |  | **Step 10:** A number greater than 6 detected in bedrooms field  **Step 11:** Display message “Bedrooms can’t be greater than 6”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Number entered in Bathrooms field:** |  | **Step 10:** A non-numeric detected in bathrooms field  **Step 11:** Display message “Bathrooms must be numbers only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in House field:** |  | **Step 10:** A non-letter detected in house field  **Step 11:** Display message “House type must be letters only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in Address Line 1 field:** |  | **Step 10:** A non-letter detected in Address Line 1 field  **Step 11:** Display message “Address Line 1 must be letters only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in Address Line 2 field:** |  | **Step 10:** A non-letter detected in Address Line 2 field  **Step 11:** Display message “Address Line 2 must be letters only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in County field:** |  | **Step 10:** A non-letter detected in County field  **Step 11:** Display message “County must be letters only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Conclusions** | The property has been added to the list. | |
| **Post conditions** | The property is now able to house tenants. | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **Update Property**

This function updates a properties details on the system. A property is identified by their Property\_ID.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Update Property** | |
| **Use Case Id** | 4.2.2 | |
| **Priority** | Medium | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Owner | |
| **Description** | This function allows administration to update any specific properties within the properties file. | |
| **Preconditions** | The property must be verified beforehand to be on the list of properties. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the update property function.  **Step 5:** Manager selects their criteria and clicks the Search button.  **Step 7:** Manager selects property to update.  **Step 9:** Manager enters updated property details, which may be one of:   * Rent per month * Bedrooms * Bathrooms * House Type * Address Line 1 * Address Line 2 * County * Activity * Owner\_ID | **Step 2:** Display UI  **Step 3:** System retrieves a list of all towns and populates the town’s combo box.  **Step 4:** System populates bed’s combo box using numbers 1-6.  **Step 6:** System validates that combo box values were selected.  **Step 5:** The system retrieves a summary of all properties with matching street from the properties file and displays on UI  **Step 7:** System populates text boxes with data from selected object in the DataGrid and displays them on the UI.  **Step 10:** System validates property details:   * All fields must be entered * Rent per month must be numeric only. * Bedrooms must be numeric only. * Bedrooms can’t be greater than 6. * Bathrooms must be numeric only. * House type must be letters only. * Address Line 1 must be letters and numbers only. * Address Line 2 must be letters only. * County must be letters only. * Activity must be A or I. * Owner\_ID must be a valid Owner\_ID.   **Step 11:** Save updated property details in Property File.  **Step 12:** Display Confirmation message  **Step 13:** Clear the UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Field not entered:** |  | **Step 10:** A blank field detected  **Step 11:** Display message “This field must be entered”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-numeric entered in Rent per month (RPM):** |  | **Step 10:** A non-numeric detected in RPM field  **Step 11:** Display message “The field must be all numeric characters”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Combo Box Search criteria not entered:** |  | **Step 6:** Search field not entered  **Step 7:** Display message “Search field not entered!”  **Step 8:** Position cursor in Search field and return to step 5 |
| **Non-Number entered in Bedrooms field:** |  | **Step 10:** A non-numeric detected in bedrooms field  **Step 11:** Display message “Bedrooms must be numbers only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Number greater than 6 entered in Bedrooms field:** |  | **Step 10:** A number greater than 6 detected in bedrooms field  **Step 11:** Display message “Bedrooms can’t be greater than 6”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Number entered in Bathrooms field:** |  | **Step 10:** A non-numeric detected in bathrooms field  **Step 11:** Display message “Bathrooms must be numbers only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in House field:** |  | **Step 10:** A non-letter detected in house field  **Step 11:** Display message “House type must be letters only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in Address Line 1 field:** |  | **Step 10:** A non-letter detected in Address Line 1 field  **Step 11:** Display message “Address Line 1 must be letters only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in Address Line 2 field:** |  | **Step 10:** A non-letter detected in Address Line 2 field  **Step 11:** Display message “Address Line 2 must be letters only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Non-Letter entered in County field:** |  | **Step 10:** A non-letter detected in County field  **Step 11:** Display message “County must be letters only”  **Step 12:** Position cursor in offending field and return to step 9 |
| **A or I not entered in Activity field:** |  | **Step 10:** Character detected in Activity field that is not A or I.  **Step 11:** Display message “Activity must be A or I!”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Invalid entry in Owner ID field:** |  | **Step 10:** Invalid value entered in Owner ID field.  **Step 11:** Display message “Owner ID must be a valid ID!”  **Step 12:** Position cursor in offending field and return to step 9 |
| **Conclusions** | The specific property data has been updated. | |
| **Post conditions** | All of these properties are able to be rented out by owners and to tenants. | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **4.3.3 Remove Property**

This function allows the user to remove a specific owner from the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Remove Property** | |
| **Use Case Id** | 4.2.3 | |
| **Priority** | Medium | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Owner | |
| **Description** | This function allows administration to remove any specific properties within the property file. | |
| **Preconditions** | The property must be verified beforehand to be on the list of properties. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the update property function.  **Step 4:** Manager selects their criteria and clicks the Search button.  **Step 8:** Manager selects property to remove.  **Step 10:** Manager selects remove button | **Step 2:** System retrieves a list of all towns and populates the town’s combo box.  **Step 3:** System populates bed’s combo box using numbers 1-6.  **Step 6:** System validates that combo box values were selected.  **Step 7:** The system retrieves a summary of all properties with matching street from the properties file and displays on UI.  **Step 9:** System populates text boxes with data from selected object in the DataGrid and displays them on the UI.  **Step 11:** System sets status for specified Property as 'Inactive'  **Step 12:** Save updated property details in Property File.  **Step 13:** Display Confirmation message  **Step 14:** Clear the UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Combo boxes not selected:** |  | **Step 6:** A blank field detected  **Step 7:** Display message “This field must be entered”  **Step 8:** Position cursor in offending field and return to step 3 |
| **Conclusions** | The specific owner data has been updated. | |
| **Post conditions** | All of these properties are able to be rented out by owners and to tenants. | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **4.3.4 Query Property**

This function allows the manager to search for a property that is listed on the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Query Property** | |
| **Use Case Id** | 4.2.4 | |
| **Priority** | Low | |
| **Source** | Manager | |
| **Primary Business Actor** | Manger | |
| **Other Participating Actors** | Owner | |
| **Description** | This function lists all properties on the system. | |
| **Preconditions** | All properties must be verified beforehand to be on the list of properties. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The admin invokes the query properties function.  **Step 3:** Manager enters property street | **Step 2:** System displays the UI  **Step 4:** System validates that the field was entered  **Step 5:** The system retrieves a summary of all properties with matching street from the Properties file and displays on UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Street not entered:** |  | **Step 4:** A blank field detected  **Step 5:** Display message “This field must be entered”  **Step 6:** Position cursor in offending field and return to step 3 |
| **Conclusions** |  | |
| **Post conditions** | This property is able to be rented out to tenants by an owner. | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

## **Manage Tenants**

## This set of functions allows a user to rent a property, update their tenant information and query necessary information regarding information that they might need when dealing with their property information.

### **Rent Property**

This function allows the manager to allocate new tenants to certain properties on the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Rent Property** | |
| **Use Case Id** | 4.3.2 | |
| **Priority** | High | |
| **Source** | User | |
| **Primary Business Actor** | User | |
| **Other Participating Actors** | Tenant, Owner | |
| **Description** | This function allocates a new tenant to a property which has an owner | |
| **Preconditions** | The Tenant must be 18 years of age to rent a property | |
| **Trigger** |  | |
| **Expected Scenario** | **User** | **System** |
|  | **Step 1:** The user invokes the Rent Property function  **Step 6:** User selects criteria and presses the search button.  **Step 9:** User selects the specific property to be rented.  **Step 11:** If existing tenant go to step 16.  **Step 14:** User enters the required data:   * Forename * Surname * Phone * Email * DOB   **Step 16:** User selects Tenant\_ID from combo box.  **Step 18:** User presses confirmation button to check the information is correct.  **Step 22:** User selects the dates they wish to start renting on and presses the rent button. | **Step 2:** Display UI  **Step 3:** The system assigns the next Booking\_ID  **Step 4:** System retrieves a list of all towns and populates the town’s combo box.  **Step 5:** System populates bed’s combo box using numbers 1-6.  **Step 7:** System checks that values were selected  **Step 8:** The system retrieves all available properties with matching criteria available from the Property file and displays on the UI.  **Step 10:** System displays Existing Tenant with Yes and No button options.  **Step 12:** System assigns next Tenant\_ID.  **Step 13:** System prompts User to enter tenant details.  **Step 15:** System validates the data:   * All fields must be entered * Forename must be letters only * Surname must be letters only * Phone must be numeric only * Email must be correct format * DOB must be over the age of 18   **Step 17:** System populates text boxes with tenant details from selected Tenant\_ID.  **Step 19:** System sets the Activity of the Tenant As A for Active.  **Step 20:** Save Tenant data in Tenants File:   * **Tenant\_ID** * Forename * Surname * Phone * Email * DOB * Activity * Prop\_ID   **Step 21:** System displays dates group and allows user to select date which they wish to start.  **Step 23**: Set End\_Date to Start\_Date plus 12 months  **Step 24:** Save Booking data in Booking File:   * Booking\_ID * Start\_Date * End\_Date * DateRegistered * Prop\_ID   **Step 25:** Display a confirmation Message  **Step 26:** Reset UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Town/Beds values not selected:** |  | **Step 6:** A blank field detected  **Step 7:** Display message “A value must be selected!”  **Step 8:** Position cursor in offending field and return to step 5 |
| **Non-numeric entered in phone field:** |  | **Step 20:** A non-numeric detected in phone field  **Step 21:** Display message “The field must be all numeric characters”  **Step 22:** Position cursor in offending field and return to step 19 |
| **Email address has incorrect format:** |  | **Step 20:** An invalid format entered for email  **Step 21:** Display message “Email format invalid”  **Step 22:** Position cursor in Email field and return to step 19 |
| **DOB has to 18 years of age or older:** |  | **Step 20:** An invalid date format entered  **Step 21:** Display message “Age has to be 18 years of age or older”  **Step 22:** Position cursor in offending field and return to step 8 |
| **Non-Letter entered in Forename field:** |  | **Step 20:** A non-letter detected in forename field  **Step 21:** Display message “Forename must be letters only”  **Step 22:** Position cursor in offending field and return to step 19 |
| **Non-Letter entered in Surname field:** |  | **Step 20:** A non-letter detected in surname field  **Step 21:** Display message “Surname must be letters only”  **Step 22:** Position cursor in offending field and return to step 19 |
| **Conclusions** | The tenant is now on the list of valid tenants. | |
| **Post conditions** | The tenant has been assigned to a property of their choosing from the properties file. | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### 

### **4.4.2 Update Tenant**

This function updates a tenants details on the system. A tenant is identified by their Tenant\_ID.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Update Tenant** | |
| **Use Case Id** | 4.3.2 | |
| **Priority** | Medium | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Tenant | |
| **Description** | This function allows administration to update any specific tenant within the tenant file. | |
| **Preconditions** | The tenant must be verified beforehand to be on the list of tenants. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the update tenant function.  **Step 3:** Manager enters tenant surname (or part of)  **Step 5:** Manager selects tenant to update.  **Step 8:** Manager enters updated tenant details, which may be one of:   * Forename * Surname * Phone * Email * Status | **Step 2:** Display UI  **Step 4:** The system retrieves a summary of all tenants with matching surname from the Tenant file and displays on UI  **Step 6:** System checks that a tenant was selected  **Step 7:** System retrieves all details for the selected tenant from the UI and displays on UI  **Step 9:** System validates tenant details:   * All fields must be entered * Forename must be letters only * Surname must be letters only * Phone must be numeric only. * Email must be correct format * Activity must be either A or I   **Step 10:** Save updated tenant details in Tenant File.  **Step 11:** Display Confirmation message  **Step 12:** Clear the UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Field not entered** |  | **Step 9:** A blank field detected  **Step 10:** Display message “This field must be entered”  **Step 11:** Position cursor in offending field and return to step 8 |
| **Non-Letter entered in Forename field:** |  | **Step 9:** A non-letter detected in forename field  **Step 10:** Display message “Forename must be letters only”  **Step 11:** Position cursor in offending field and return to step 19 |
| **Non-Letter entered in Surname field:** |  | **Step 9:** A non-letter detected in surname field  **Step 10:** Display message “Surname must be letters only”  **Step 11:** Position cursor in offending field and return to step 19 |
| **Non-numeric entered in Phone field** |  | **Step 8:** A non-numeric detected in RPM field  **Step 9:** Display message “The field must be all numeric characters”  **Step 10:** Position cursor in offending field and return to step 7 |
| **Email address has invalid format** |  | **Step 8:** An invalid format entered for email  **Step 9:** Display message “Email format invalid”  **Step 10:** Position cursor in Email field and return to step 7 |
| **Invalid character entered in Activity field** |  | **Step 8:** A character other than A or I entered in the activity field  **Step 9:** Display message “Activity must be either A or I”  **Step 10:** Position cursor in Email field and return to step 7 |
| **Search field not entered** |  | **Step 5:** A blank field detected  **Step 6:** Display message “This field must be entered”  **Step 7:** Position cursor in offending field and return to step 4 |
| **Conclusions** | The specific tenant data has been updated. | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **4.4.3 Remove Tenant**

This function allows the user to remove a specific tenant from the system

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Remove Tenant** | |
| **Use Case Id** | 4.3.3 | |
| **Priority** | Medium | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Tenant | |
| **Description** | This function allows administration to remove any specific tenants from within the tenant file. | |
| **Preconditions** | The tenant must be verified beforehand to be on the list of tenants. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the remove tenant’s function.  **Step 3:** Manager enters tenant surname (or part of)  **Step 6:** Manager selects Tenant to remove.  **Step 8:** Manager presses Remove Tenant button | **Step 2:** Display UI  **Step 4:** System validates that the field was entered  **Step 5:** The system retrieves a summary of all tenants with matching surname from the Tenants file and displays on UI  **Step 7:** System populates text boxes with the data from the selected object in the DataGrid.  **Step 9:** System sets status for specified Tenant as 'Inactive'  **Step 10:** Save updated Tenant details in Tenant File.  **Step 11:** Display Confirmation message  **Step 12:** Clear the UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Search field not entered:** |  | **Step 4:** A blank field detected  **Step 5:** Display message “This field must be entered”  **Step 6:** Position cursor in offending field and return to step 3 |
| **Conclusions** | The specific tenant data has been updated. | |
| **Post conditions** | The tenant can no longer rent out any property on the system. | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### 

### **4.4.4 Query Tenant**

This function will list the tenant that are verified and listed on the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Query Tenant** | |
| **Use Case Id** | 4.3.4 | |
| **Priority** | Low | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | Tenant | |
| **Description** | This function lists all tenants on the system. | |
| **Preconditions** | All tenants must be verified beforehand to be on the list of tenants. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the list all tenants function.  **Step 3:** Manager enters tenant surname (or part of) | **Step 2:** System displays the UI  **Step 4:** System validates that the field was entered  **Step 4:** The system retrieves a summary of all tenants with matching surname from the Tenant file and displays on UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Search field not entered:** |  | **Step 4:** A blank field detected  **Step 5:** Display message “This field must be entered”  **Step 6:** Position cursor in offending field and return to step 3 |
| **Conclusions** | The tenant specified is a valid tenant in the Tenant file. | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

## **4.5 Process Admin**

This process allows management to keep track of income being made through certain locations on the system.

### **4.5.1 Calculate Rent**

This function allows the Manager to calculate the total rent for the month for a specific county or even town if necessary.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Calculate Rent** | |
| **Use Case Id** | 4.5.1 | |
| **Priority** | Medium | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** |  | |
| **Description** | This function allows the Manager to calculate the rent for a specific location | |
| **Preconditions** | All properties must be verified beforehand to be on the list of properties. | |
| **Trigger** |  | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the Calculate Rent function.  **Step 4:** Manager selects county from the list  Step 7: Manager can choose to select Search with just county for a county wide analysis or select a town as well  **Step 7:** Manager selects either yes or no | **Step 2:** System displays the UI  **Step 3:** System populates County combo box with list of counties in Properties table  **Step 4:** System validates that a county was selected  **Step 5:** System displays and populates a Town combo box with a list of towns in Properties table as well as a Search button.  **Step 6:** System asks Manager is that all the tenants they wish to calculate from**.**  **Step 8:** System validates that the yes button was entered  **Step 9:** System uses the Prop\_ID of each Tenant to add all of the Rent per Month from the Properties file  **Step 10:** System displays the total on UI  **Step 11:** Display Confirmation message  **Step 12:** Clear UI |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Tenant not entered:** |  | **Step 4:** Tenant not entered  **Step 5:** Display message “Tenant must be selected”  **Step 6:** Position cursor in offending field and return to step 3 |
| **No option selected:** |  | **Step 8:** No option selected  **Step 9:** Display list of tenants again with the tenants previously selected in step 3 highlighted.  **Step 10:** Position cursor in offending field and return to step 3 |
| **Conclusions** | The rent of the specified tenants is calculated | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

# **System Model**

The following dataflow diagrams have been produced for the system:

## **5.1 Level-0 DFD**

Application Rent

Tenant

Rent Property

Applicant

Correspondence Property

## **5.2 Level-1 DFD**

P2

Process

Property

Applicant

Application PropID Rent

D2 Property

P3

Process Tenant

Rent

OwnerID

Receipt Tenant Details

D1 Owner

D3 Tenants

P1

Process

Owner

## **Level-2 DFD (Process P1: Owner)**

P1.1

Add Owner

Details

New Owner

Details New Owner Details

P1.2

Update Owner

Owner DetailsCurrent Details

P1.3

Remove Owner

D1 Owner

Specific Owner

Inactive status

P1.4

Query Owner

## **Level-2 DFD (Process P2: Property)**

D1 Owner

P2.4

Query Property

D2 Property

P2.1

Add Property

New Property

Details Details

P2.2

Update Property

Details New Prop Details

Prop Details Current Details

P2.3

Remove Property

Specific Property

Inactive status

## **Level-2 DFD (Process P3: Tenant)**

D2 Property

P3.1

Rent Property

Details

Details

New Tenant

P3.2

Update Tenant

Details New Tenant Details

D3 Tenant

Tenant Details Current Details

P3.3

Remove Tenant

Specific Tenant

P3.4

Query Tenant

Inactive status

## **Level-2 DFD** (Process P4: Admin)

D2 Properties

D3 Tenants

Tenant Details Rent per month

P4.1

Calculate Rent

# **Data Model (Class Diagram)**

In this data model, there will be a class diagram which shows the way the property, owner and tenant files interact with each other. A relational schema which details the relational attributes of the various files and checks for relational integrity. A database schema which details the specific attributes of the files.

## **Class Diagram**



## **Relational Schema**

**Owner** {OwnerID, Forename, Surname, Street, Town, County, Phone, Email, DOB, Status, Dateregistered}

**Property** {PropID, Rentpermonth, Bedrooms, Bathrooms, Housetype, Street, Town, County, Status, OwnerID}

**Tenant** {TenantID, Forename, Surname, Phone, Email, DOB, Status, PropID}

## **Database Schema**

**Schema: Property Rental System**

**Relation: Owner**

Attributes:

OwnerID numeric(10) unique not null auto\_increment

Forename char(15) not null

Surname char(15) not null

Street char(20) not null

Town char(20) not null

County char(15) not null

Phone char(15)

Email char(25) not null

DOB Date

Status char(8) not null

Dateregistered Date not null

**Primary Key**: OwnerID

**Relation: Property**

Attributes:

PropID numeric(10) unique not null auto\_increment

Rentpermonth numeric(5) not null

bedrooms numeric(2) not null

bathrooms numeric(2) not null

housetype char(15) not null

Street char(20) not null

Town char(20) not null

County char(15) not null

Status char(8) not null

OwnerID numeric(10) unique

**Primary Key**: PropID

**Foreign Key:** OwnerID references OwnerID in Owner Table

**Relation: Tenant**

Attributes:

TenantID numeric(10) unique not null auto\_increment

Forename char(15) not null

Surname char(15) not null

Phone char(15) not null

Email char(25) not null

DOB Date not null

Status char(8) not null

PropID numeric(10) unique not null

**Primary Key**: TenantID

**Foreign Key**: PropID references PropID in Property Table

# **Conclusion**

This project was a beneficial experience in that it helped me learn about how to plan ahead of time. I encountered certain problems throughout this project, particularly developing my use-case narratives and their intricacies. It proved to be a useful exercise in foresight and discipline for developing work on my project. In hindsight, I would have learned earlier about the details of the particular pieces of the project.

