CARSYS

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Course Title – Stage 2

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## Introduction

# Functional Components

# 3. User Requirements

### 1. CARSYS will perform car administration.

1.2 CARSYS will add a car from the list

1.3 CARSYS will remove a car

1.4 CARSYS will allow updates to car details

1.5 CARSYS will generate a car list

2.CarSys will perform reservation administration.

2.1 CARSYS will allow bookings to be made

2.2 CARSYS will allow bookings to be cancelled

2.3 CARSYS will record the collection of a car

2.4 CARSYS will record the return of a car

3.CARSYS will perform financial administration.

3.1 CARSYS will generate an analysis of income

3.2 CARSYS will generate an analysis of rental cars

# 4. System Requirements

The following system allows the user to add a car, manage cars, manage reservations and manage finances of a car rental business// need to say more here

# System Level Use Case Diagram

This is a high level description of the functions needed in the car rental system

CARSYS

Manage Cars

RECEPTIONIST

CUSTOMER

uUSTOMER

RECEPTIONIST

Manage Reservations

Manage Finances

### **5.1. Manage Cars**

**CARSYS** will contain functions which will manage the rental of cars. //say more here

**5.1.1 Add Car**

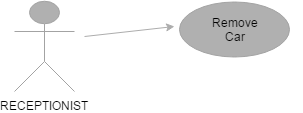
This function allows cars to be added to CARSYS

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|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Add Car | |
| **Use Case Id** | 4.2.2 | |
| **Priority** | Medium | |
| **Source** |  | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** |  | |
| **Description** | This function allows the user to add a new vehicle to CARSYS | |
| **Preconditions** |  | |
| **Trigger** |  | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist invokes the Add Car function  **Step 4:** Receptionist enters the car information   * registration number * make * model * number of doors * fuel type * Class | **Step 2:** System retrieves details of car classes from the Class file and displays on UI  **Step 3:** System displays the UI  **Step 5:** System validates data:   * All fields must be entered * Registration number must not already be added   **Step 6:** System assigns car status ‘Available’  **Step 7:** The cars details are saved to the Car file  **Step 8:** System displays confirmation message  **Step 9:** System resets UI |
| **Alternate Scenarios** | Actor Action | System Response |
| **No data selected** |  |  |
| **Conclusions** | New car is added to the car rental system. | |
| **Post conditions** | This car may now be rented | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **5.1.2 Remove Car //Stopped here with numbering**

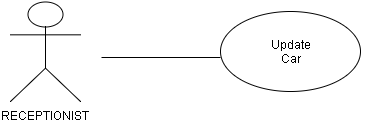
When a car is not repairable or if it has reached a certain mileage, the car is no longer available for renting. The car is then flagged as ‘Removed’ on the system.



|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Remove Car | |
| **Use Case Id** | 4.1.3 | |
| **Priority** | High | |
| **Source** |  | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** |  | |
| **Description** | This use case allows the user to set the status of the car to "Removed" | |
| **Preconditions** |  | |
| **Trigger** | None | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist invokes the Remove Car function  **Step 3:** Receptionist enters the registration number of car to CARSYS to be removed  **Step 7:** receptionist confirms car is to be removed | **Step 2:** System displays the UI  **Step 4:** System retrieves details of the car from the Car File and the Reservations file to determine if the car has pending reservations.  **Step 5:** If reservations exist for the car or if the car status is not ‘available’ the system alerts the receptionist and returns to step 3. :   * if car status is set to “on-hire” then display error message * if car status is "Removed" then display error message * if reservations exist in the reservations file then proceed to step 9   **Step 6:** Car details are displayed on UI for viewing only.  **Step 8:** Car status is set to "Removed" in Car File  **Step 9:** Display confirmation message  **Step 10:** System resets UI |
| **Alternate Scenarios** | Actor Action | System Response |
| **No data selected** |  |  |
| **Conclusions** | Car is now removed from the car CARSYS | |
| **Post conditions** | This car can no longer be rented | |
| **Business Rules** | Only an available car without reservations can be removed. | |
| **Implementation Constraints** |  | |

### **4.1.4 Update Car**

This function allows the cars information to be updated on CARSYS



|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Update Car | |
| **Use Case Id** | 4.1.4 | |
| **Priority** | Medium | |
| **Source** |  | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** |  | |
| **Description** | This use case allows the user to update the cars information | |
| **Preconditions** | Something must have changed about a car in order to update any information on it | |
| **Trigger** |  | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist invokes the Update Car function  **Step 3:** Receptionist enters the registration number of the car  **Step 5:** Receptionist enters new information on car | **Step 2:** System displays the UI  **Step 4:** The system retrieves details of car from Car File and displays on UI for viewing only  **Step 6:** Car status is set to "Updated" in Car File  **Step 7:** System displays confirmation message  **Step 8:** System resets |
| **Alternate Scenarios** | Actor Action | System Response |
|  |  |  |
| **Conclusions** | Cars information is updated on CARSYS | |
| **Post conditions** |  | |
| **Business Rules** | Something must have changed about the car in order for it to be changed. | |
| **Implementation Constraints** |  | |

### **4.1.5 View Car List**

This function allows the user to view all the cars on the CARSYS

RECEPTIONIST

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | View Car List | |
| **Use Case Id** | 4.1.5 | |
| **Priority** | Medium | |
| **Source** |  | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** |  | |
| **Description** | This use case enables the car list to be viewed on CARSYS | |
| **Preconditions** |  | |
| **Trigger** | None | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist invokes the View Car List function  **Step 4:** Receptionist selects a filter for list:   * All * Available Cars * Rented Cars * Removed Cars | **Step 2:** System displays the UI  **Step 3:** System retrieves the Car details from the Car File in alphabetical order of Make and Model and displays on UI  **Step 6:** System retrieves the Car details from the Car File for the specified filter in alphabetical order of Make and Model and displays on UI |
| **Alternate Scenarios** | Actor Action | System Response |
| **Print Copy Requested** | **Step 4:** Receptionist requests a print copy | **Step 5:** Generate a print file and sends to printer |
| **Conclusions** | Receptionist can view car list | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **4.2.1 Make Booking**

This function allows the user to make a booking on CARSYS

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|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Make Booking | |
| **Use Case Id** | 4.2.1 | |
| **Priority** | High | |
| **Source** | Customer | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** | Customer | |
| **Description** | This function allows bookings on CARSYS | |
| **Preconditions** |  | |
| **Trigger** | None | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist invokes the Make Booking function  **Step 4:** Receptionist enters the booking details   * date * time * car details * payment method   **Step 4:** The receptionist Selects  "OK" or "Cancel"   * If receptionist selects "CANCEL" return to homepage | **Step 2:** System displays the UI  **Step 3:** System retrieves the booking file  **Step 5:** The booking is made and the system terminates |
| **Alternate Scenarios** | Actor Action | System Response |
|  |  |  |
| **Conclusions** | A cars information is updated on the rental system. | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **4.2.2 Cancel Booking**

This function allows bookings to be madeC:\Users\Emma\Downloads\Untitled Diagram (7).png

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Cancel Booking | |
| **Use Case Id** | 4.2.2 | |
| **Priority** | High | |
| **Source** |  | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** | Customer | |
| **Description** | This use case allows booking to be cancelled | |
| **Preconditions** |  | |
| **Trigger** | None | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist invokes the Cancel Booking function  **Step 4:** Receptionist selects the booking in the booking file in order to cancel it | **Step 2:** System displays the UI  **Step 3**: System retrieves the booking file  **Step 5:** The receptionist Selects  "OK" or "Cancel"   * If receptionist selects "CANCEL" return to homepage   **Step 6:** System cancels the booking and the system terminates |
| **Alternate Scenarios** | Actor Action | System Response |
|  |  |  |
| **Conclusions** | Booking is cancelled | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **4.2.3 Collect Car**

This function allows car collections to be arranged

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|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Pick Car | |
| **Use Case Id** | 4.2.3 | |
| **Priority** | Medium | |
| **Source** | Customer | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** |  | |
| **Description** | This function allows a customer to arrange the collection of their rental car | |
| **Preconditions** |  | |
| **Trigger** | None | |
| **Expected Scenario** | Actor Action | System Response |
| **Collection arranged** | **Step 1:** Receptionist invokes the Pick Car function  **Step 4:** Receptionist schedules the collection  **Step 5:** The receptionist Selects  "OK" or "Cancel"   * If receptionist selects "CANCEL" return to homepage | **Step 2:** System displays the UI  **Step 3:** System retrieves collection file and displays the collection arrangements  **Step 6:** Collection appointment is made and the system terminates |
| **Alternate Scenarios** | Actor Action | System Response |
|  |  |  |
| **Conclusions** |  | |
| **Post conditions** |  | |
| **Business Rules** | Customer must schedule pickup at least one day in advance | |
| **Implementation Constraints** |  | |

### **4.2.4 Return Car**

This function allows cars to be scheduled to be returned

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|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Return Car | |
| **Use Case Id** | 4.2.4 | |
| **Priority** | High | |
| **Source** |  | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** | Customer | |
| **Description** | This function allows the receptionist to schedule when the customer brings back the car to the rental company | |
| **Preconditions** |  | |
| **Trigger** | None | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist invokes the Return Car function  **Step 4:** Receptionist fills out the return form  **Step 5:** Receptionist selects return details  **Step 6:** The receptionist Selects  "OK" or "Cancel"   * If receptionist selects "CANCEL" return to homepage | **Step 2:** System displays the UI  **Step 3:** System retrieves the Return Car file and displays the return bookings  **Step 7:** Return is scheduled and the system terminates |
| **Alternate Scenarios** | Actor Action | System Response |
|  |  |  |
| **Conclusions** | Return is scheduled | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **4.4 . Finances**

### **4.4.1. Income Analysis**

This function performs an Income AnalysisC:\Users\Emma\Downloads\Untitled Diagram (11).png

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Income Analysis | |
| **Use Case Id** | 4.4.1 | |
| **Priority** | High | |
| **Source** |  | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** | Accountant | |
| **Description** | This function generates the annual revenues and gains of the company | |
| **Preconditions** |  | |
| **Trigger** |  | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist invokes the Income Analyst function  **Step 4:** Receptionist fills out the required figures  **Step 5:** The receptionist Selects  "OK" or "Cancel"   * If receptionist selects "CANCEL" return to homepage | **Step 2:** System displays the UI  **Step 3:** System retrieves the Income Analysis file  **Step 6:** System calculates Net Profit and displays result  **Step 7:** Result is displayed and the system terminates |
| **Alternate Scenarios** | Actor Action | System Response |
| **Print Copy Requested** | **Step 5:** Receptionist requests a print copy | **Step 6:** Generate a print file and sends to printer |
| **Conclusions** | Income analysis is complete | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

### **4.4.1 Income Analysis**

This function performs a Car Analysis

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|  |  |  |
| --- | --- | --- |
| **Use Case Name** | Car Analysis | |
| **Use Case Id** | 4.4.2 | |
| **Priority** | High | |
| **Source** |  | |
| **Primary Business Actor** | Receptionist | |
| **Other Participating Actors** | Mechanic | |
| **Description** | This function allows receptionist to inter the mechanics report | |
| **Preconditions** |  | |
| **Trigger** | None | |
| **Expected Scenario** | Actor Action | System Response |
|  | **Step 1:** Receptionist starts the Car Analysis function  **Step 4:** Receptionist selects the car  **Step 5:** Receptionist inputs the mechanics report to CARSYS | **Step 2:** System displays the UI  **Step 3:** System retrieves and displays the Car Analysis file  **Step 6:** System validates and then terminates |
| **Alternate Scenarios** | Actor Action | System Response |
| **Print Copy Requested** | **Step 5:** Receptionist requests a print copy | **Step 6:** Generate a print file and sends to printer |
| **Conclusions** | The car analysis is entered into CARSYS | |
| **Post conditions** |  | |
| **Business Rules** |  | |
| **Implementation Constraints** |  | |

## Level-0 DFD

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## Level-1 DFD

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## Level-2 DFD (Process P1: Manage Cars)

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## Level-2 DFD (Process P2: Manage Reservations)

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## Level-2 DFD (Process P3: Manage Finances)

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# Data Model (Class Diagram)

Brief introduction……

## Class Diagram

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## Relational Schema

Reservations(ReservationID, Date, PaymentMethod, CarType)

Cars(CarID, Make, FuelType, Model)

Payments(PaymentID, Method, Date)

## Database Schema

**Relation:** Reservations

**Attributes:**

ReservationsID Numeric (2)

Date date

PaymentMethod Char(20)

CarType Char (20)

PRIMARY KEY ReservationsID

**Relation:** Cars

**Attributes:**

CarID Numeric (3)

Make Char (30)

FuelType Char (30)

PhoneNo Char (10)

Model Char(10)

PRIMARY KEY CarID

**Relation:**

**Attributes:**

PaymentsID Numeric (3)

Method Char (30)

FuelType Char (30)

Date date

PRIMARY KEY PaymentsID

# Conclusion

In conclusion CARSYS will allow the receptionist to make a reservation on behalf of the customer to rent a car, the receptionist has to select the car class, fuel type etc. CARSYS will manage reservations by having functions. The prototype for CARSYS has a main form which allows the receptionist to navigate to each different function.

# Appendices

## Appendix A – Title

## Appendix B – Title

Might include:

* **Lookup / Referencetables**
* **Sample reports / Listings**