

# **CSC 540 - DATABASE MANAGEMENT CONCEPTS & SYSTEMS**

## **FALL 2022 PROJECT 1 - DATABASE APPLICATION DESIGN & IMPLEMENTATION**

### **AUTOR - Auto Repair and Service Management System Application Flow**

This document is just to give you a general idea of the application flow. Please make sure you refer to the description and handle all the requirements/constraints mentioned therein. Since there is no overlap between any roles, the application will provide a single login screen and redirect the user to the appropriate home page. There are five different types of home pages depending on the type of user:

- 1) Admin
- 2) Manager
- 3) Customer
- 4) Receptionist
- 5) Mechanic

Please make sure you verify the login credentials before logging in.

## Application Menu

Below is the application menu for the **AUTOR** system. We expect you to follow this program flow strictly. **You must validate all user input and display appropriate error messages whenever necessary prompting the user to re-enter their input, even if it may not be explicitly stated.**

## Start Pages

### Home

Display	Menu	Input	Output
Display the menu	1. <a href="#">Login</a> 2. Exit	Enter Choice (1-2)	Go to the appropriate page.  If exit is chosen, terminate the program.

### Login

Display	Menu	Input	Output
Ask user to input the following details in the order shown below, followed by the menu  A. User ID B. Password	1. Sign-In 2. <a href="#">Go Back</a>	Take input from user about their credentials.  After entering details A-B, choose option 1-2 from the Menu	If the user chooses 1, validate credentials and recognize if user is an Admin, Manager, Receptionist, Mechanic or Customer and go to the correct <b>Landing page</b> . Print "Login Incorrect" for invalid credentials and ask to enter again.  If the user chooses 2, discard the input and go back to the

			<b>Home page</b>
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## Admin pages

### Admin: Landing

Display	Menu	Input	Output
Display the menu	1. <a href="#">System Set Up</a> 2. <a href="#">Add New Store</a> 3. <a href="#">Add New Service</a> 4. <a href="#">Logout</a>	Enter choice (1-4)	Display the correct page depending on choice 1-3. For 4, logout and return to the <b>Home page</b>

### Admin: System Set Up

Display	Menu	Input	Output
Ask user to input the following details in the order shown below, followed by the menu  A. Input file that contains the service general information B. Input file that contains the store general information	1. Upload service general information 2. Upload store general information 3. <a href="#">Go Back</a>	Take input from the user about service.  After entering details A-B, choose option 1-2 from the Menu	Display the “success” or “fail” message that the file was uploaded or not and stay at the same page if option 1 or 2 was chosen. Discard the input and go back to <b>Admin: Landing Page</b> if option 3 is chosen

### Admin: Add New Store

Display	Menu	Input	Output
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<p>Ask user to input the following details in the order shown below, followed by the menu</p> <p>A. Store ID B. Address C. Manager's information (first name, lastname, username, password, salary and employeeid) D. Min and max wage for mechanics</p>	<p>1. Add Store 2. <a href="#">Go Back</a></p>	<p>Take input from the user about service.</p> <p>After entering details A-D, choose option 1-2 from the Menu</p>	<p>Display the "success" or "fail" message that the service was added or not and stay at the same page if option 1 is chosen. Discard the input and go back to Admin Landing Page if option 2 is chosen</p>
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#### Admin: Add New Service

Display	Menu	Input	Output
<p>Ask user to input the following details in the order shown below, followed by the menu</p> <p>A. Enter existing service category (raise error if category doesn't exist) B. Service Name C. Duration of a service</p>	<p>1. Add Service 2. <a href="#">Go Back</a></p>	<p>Take input from the user about service.</p> <p>After entering details A-C, choose option 1-2 from the Menu</p>	<p>Display the "success" or "fail" message that the service was added or not and stay at the same page if option 1 is chosen. Discard the input and go back to Admin Landing Page if option 2 is chosen</p>

## Customer pages

#### Customer: Landing

Display	Menu	Input	Output
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Display the menu	1. <a href="#">View and Update Profile</a> 2. <a href="#">View and Schedule Service</a> 3. <a href="#">Invoices</a> 4. <a href="#">Logout</a>	Enter choice (1-4)	Display the correct page depending on choice 1-3. For 4, logout and return to the <b>Home page</b>
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#### Customer: Profile

Display	Menu	Input	Output
Display the menu	1. <a href="#">View Profile</a> 2. <a href="#">Add Car</a> 3. <a href="#">Delete Car</a> 4. <a href="#">Go Back</a>	Enter choice (1-4)	Display the correct page or go back to <b>Customer: Landing page</b>

#### Customer: View Profile

Display	Menu	Input	Output
Display the following details followed by the menu.  A. Customer ID B. Full name C. Address D. Email Address E. Phone Number F. List of All Cars (and their details)	1. <a href="#">Go Back</a>	Enter Choice (1)	Go back to <b>Customer: Profile page</b>

#### Customer: Add Car

Display	Menu	Input	Output
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<p>Ask user to input the following details in the order shown below, followed by the menu.</p> <p>A. VIN number B. Car Manufacturer name C. Current mileage D. Year</p>	<p>1. Save Information 2. <a href="#">Cancel</a></p>	<p>Take input from the user about their car details.</p> <p>After entering details A-D, choose option 1-2 from the Menu</p>	<p>If the user chooses 1 record all the information of car in the database, display a message that the vehicle record was saved, and go back to <b>Customer: Landing page</b></p> <p>If the user chooses 2, discard all input and directly go to <b>Customer: Landing page</b></p>
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#### Customer: Delete Car

Display	Menu	Input	Output
<p>Display all the available cars of the user with the following details in the order shown below, followed by the menu.</p> <p>A. VIN number C. Car Manufacturer D. Current mileage E. Year</p>	<p>1. Select the car to delete 2. <a href="#">Go Back</a></p>	<p>User is prompted to insert the VIN number of the car they want to delete.</p>	<p>If the user chooses 1, they are prompted for the VIN number. When the car is deleted, the appropriate message pops up and the user is redirected to <b>Customer: Landing page</b></p> <p>If the user chooses 2, go back to <b>Customer: Landing page</b></p>

#### Customer: View and Schedule Service

Display	Menu	Input	Output
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Display the menu	1. <a href="#">View Service History</a> 2. <a href="#">Schedule Service</a> 3. <a href="#">Go Back</a>	Enter choice (1-3)	Display the correct page or go back to <b>Customer: Landing page</b>
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#### Customer: View Service History

Display	Menu	Input	Output
<p>Ask user to input the following details in the order shown below, followed by the menu,</p> <p>A. The VIN number of car</p>	1. Show History 2. <a href="#">Go Back</a>	Enter Choice (1-2)	<p>If 1, display the following details for each service obtained by this customer</p> <p>A. Service ID  B. VIN Number  C. Service Type  D. Service Cost  E. Mechanic Name  F. Service Start Date/Time  G. Service End Date/Time (expected or actual)</p> <p>If 2, Go back to <b>Customer: Service page</b></p>

#### Customer: Schedule Service

Display	Menu	Input	Output
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<p>Ask user to input the following details in the order shown below, followed by the menu.</p> <p>A. VIN Number B. Current Mileage</p>	<ol style="list-style-type: none"> <li>1. <a href="#">Add Schedule Maintenance</a></li> <li>2. <a href="#">Add Schedule Repair</a></li> <li>3. <a href="#">View cart and select schedule time</a></li> <li>4. <a href="#">Go Back</a></li> </ol>	<p>Take input from user about their car.</p> <p>After entering details A-B, choose option 1-4 from the Menu</p>	<p>Display the correct page or go back to <b>Customer: View and Schedule Service page</b></p>
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#### Customer: Schedule Maintenance

Display	Menu	Input	Output
<p>Display a message with the service schedule the customer is eligible for (A, B, or C) and the cost.</p>	<ol style="list-style-type: none"> <li>1. Accept and add to cart</li> <li>2. Decline and go back to previous page</li> </ol>	<p>Enter Choice 1 or 2</p>	<p>If the user selects 1, add the service to the cart and redirect user to the <b>Customer: Schedule Service page</b></p> <p>If the user chooses 2, go back to <b>Customer: Schedule Service page</b></p>

#### Customer: Schedule Repair

Display	Menu	Input	Output
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Display the menu to allow the user to pick one of the possible categories.	<ol style="list-style-type: none"> <li>1. <a href="#">Engine Services</a></li> <li>2. <a href="#">Exhaust Services</a></li> <li>3. <a href="#">Electrical Services</a></li> <li>4. <a href="#">Transmission Services</a></li> <li>5. <a href="#">Tire Services</a></li> <li>6. <a href="#">Heating and AC Services</a></li> <li>7. <a href="#">Go Back</a></li> </ol>	Enter Choice (1-7)	<p>If the user chooses 1-6, they are redirected to the page <b>Individual Service X</b> page, which lists individual services within the selected category</p> <p>Go Back: return to <b>Customer Schedule Service</b> page.</p>
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#### Customer: Individual services of category X

( note: Each service category has to have its own page with individual services; X = Engine, Exhaust Services, ...)

Display	Menu	Input	Output
Display the menu with the appropriate services listed based on the selected category.	<ol style="list-style-type: none"> <li>1. Belt Repair</li> <li>2. Engine Repair</li> <li>.</li> <li>.</li> <li>.</li> <li>N. <a href="#">Go Back</a></li> </ol>	Enter Choice (1-N)	<p>If the user chooses 1-(N-1), confirm the selection and add the selected service to the cart. Display the message that the selected service(s) was/were added to the cart. Then, they are redirected to <b>Customer: Schedule Service page</b></p> <p>If the user chooses N, go to <b>Customer: Schedule Repair page</b></p>

#### Customer: View cart and select schedule time

Display	Menu	Input	Output
Display the list of services in the cart and ask the user to confirm if they would like to proceed with scheduling.	1. <a href="#">Proceed with scheduling</a> 2. <a href="#">Go back</a>	Enter Choice (1-2)	If the user chooses 1, proceed to <b>Schedule services in cart page</b>  If 2, go back to <b>Customer: Schedule Service page</b>

#### Customer: Schedule services in cart

Display	Menu	Input	Output
Display possible service times that accommodate all services in the cart within 30 days.	Choices 1 - N of possible time slots.	Enter a choice between 1 and N	Generate a new invoice and add the appointment to the service record.  Go back to <b>Customer: Landing page</b>

#### Customer: Invoices

Display	Menu	Input	Output
Display the list of customer's invoices in the format: 1) <i>Invoiceid, status (paid/unpaid)</i> 2) ...	1. <a href="#">View Invoice details</a> 2. <a href="#">Pay invoice</a> 3. <a href="#">Go Back</a>	Enter Choice (1 - 3)	If the user chooses 1, the user will be prompted for invoice id. If the invoice id exists, the user will be redirected to <b>Customer: View Invoice details page</b>  If the user chooses 3, they will be redirected to the <b>Customer:</b>

			<b>Landing page</b>
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#### Customer: View Invoice details

<b>Display</b>	<b>Menu</b>	<b>Input</b>	<b>Output</b>
<p>Ask user to input the following details in the order shown below, followed by the menu</p> <p>A. Invoice ID</p>	<ol style="list-style-type: none"> <li>1. <a href="#">View Invoice</a></li> <li>2. <a href="#">Go Back</a></li> </ol>	<p>Enter Choice (1 - 2)</p>	<p>If the user chooses 1, show the information below:</p> <p>A. Invoice ID  B. Customer ID  C. VIN  D. Service Date  E. Service(s) IDs  F. Service(s) Type(s)  G. Invoice Status (paid/unpaid)  H. Mechanic's name  I. Cost for each service  J. Total Cost</p> <p>Stay on the page if the user wants to see the details of other invoices.</p> <p>If the user chooses 2, they will be redirected to the <b>Customer: Invoices</b></p>

#### Customer: Pay Invoice

<b>Display</b>	<b>Menu</b>	<b>Input</b>	<b>Output</b>
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<p>Ask user to input the following details in the order shown below, followed by the menu</p> <p>A. Invoice ID</p>	<p>1. Pay Invoice</p> <p>2. <a href="#">Go Back</a></p>	<p>Enter Choice (1 - 2)</p>	<p>If 1, let the system to update the invoice record only if the invoice status was unpaid, otherwise display a message telling that the invoice is already paid.</p> <p>Stay on the page if the user wants to pay for other invoices.</p> <p>If 2, the user will be redirected to <b>Customer: Invoices page</b> and no updates will be made to the invoice status.</p>
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## Receptionist pages

### Receptionist: Landing Page

Display	Menu	Input	Output
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Display the menu	1. <a href="#">Add New Customer Profile</a> 2. <a href="#">Find Customers with Pending Invoices</a> 3. <a href="#">Logout</a>	Enter choice (1-3)	Display the correct page depending on choice 1-2. For 3, logout and return to the <b>Home page</b>
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#### Receptionist: Add New Customer Profile Page

Display	Menu	Input	Output
<p>Ask user to input the following details in order to show the described output followed by an option to go back as shown under "Menu".</p> <ul style="list-style-type: none"> <li>A. Customer Name</li> <li>B. Address</li> <li>C. Email Address</li> <li>D. Phone Number</li> <li>E. Username</li> <li>F. VIN Number</li> <li>G. Car manufacture</li> </ul>	1. <a href="#">Go Back</a>	Enter choice (1)	<p>After the user has provided input for the new customer, save the record to the database and go back to <b>Receptionist: Landing Page</b></p> <p>If the user chooses 1, go back to <b>Receptionist: Landing Page</b></p>

r H. Current mileage I. Year			
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#### Receptionist: Find Customers with Pending Invoices

Display	Menu	Input	Output
<p>Display the following details followed by the menu.</p> <p>A. Customer ID B. Customer Name C. Invoice ID D. Invoice Date E. Amount</p>	<p>1. <a href="#">Go Back</a></p>	<p>Enter choice (1)</p>	<p>Go back to <b>Receptionist: Landing Page</b></p>

## Manager pages

#### Manager: Landing Page

Display	Menu	Input	Output
<p>Display the menu</p>	<p>1. <a href="#">Setup Store</a> 2. <a href="#">Add New Employee</a> 3. <a href="#">Logout</a></p>	<p>Enter choice (1-3)</p>	<p>Display the correct page depending on choice 1-2. For 3, logout and return to the <b>Home page</b></p>

### Manager: Setup Store

Display	Menu	Input	Output
Display the menu	1. <a href="#">Add employees</a> 2. <a href="#">Setup operational hours</a> 3. <a href="#">Setup service prices</a> 4. <a href="#">Go back</a>	Enter choice (1-4)	Display the correct page depending on choice 1-3.  If the user chooses 4, go back to <b>Manager: Landing page</b>

### Manager: Add Employees

Display	Menu	Input	Output
Ask user to input the following details in the order shown below, followed by the menu.  A. Name B. Address C. Email Address D. Phone Number E. Role F. Start Date G. Compensation (\$)  	1. Add 2. <a href="#">Go Back</a>	Take input from user about the new employee.  After entering details A-G, choose option 1-2 from the menu	If the user chooses 1, create a new employee record for this service center and display the new employee ID number. Set the default password for this employee.  They should be allowed to create accounts for only receptionists and mechanics. Also, each employee can only be associated with one service center.  After creating the account, show a confirmation message and go back to <b>Manager: Setup Store page</b>

			<p>If the user chooses 2, go back to the <b>Manager: Setup Store page</b></p>
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#### Manager: Setup Operational Hours

Display	Menu	Input	Output
<p>Ask user to input the following details in the order shown below, followed by the menu.</p> <p>A. Operational on Saturdays?</p>	<p>1. Setup operational hours</p> <p>2. <a href="#">Go back</a></p>	<p>Enter choice (1-2)</p>	<p>If the user chooses 1, take a single input from the user indicating whether the store will be open on Saturdays or not. Then setup the operational hours of the store as described in the description and go back to the <b>Manager: Setup Store page</b></p> <p>If the user chooses 2, go back to the <b>Manager: Setup Store page</b></p>

#### Manager: Setup Service Prices

Display	Menu	Input	Output
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Display the menu	1. <a href="#">Setup maintenance service prices</a> 2. <a href="#">Setup repair service prices</a> 3. <a href="#">Go back</a>	Enter choice (1-3)	Display the correct page depending on choice 1-2.  If the user chooses 3, go back to the <b>Manager: Setup Store page</b>
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#### Manager: Setup Maintenance Service Prices

Display	Menu	Input	Output
Ask user to input the following details in the order shown below, followed by the menu.  A. Schedule A price B. Schedule B price C. Schedule C price	1. Setup prices 2. <a href="#">Go back</a>	Take input from user about the service prices. After entering details A-C, choose option 1-2 from the Menu	If the user chooses 1, record all the information of the schedule prices in the database. Then, go back to <b>Manager: Setup Service Prices page</b>  If the user chooses 2, go to the <b>Manager: Setup Service Prices page</b>

#### Manager: Setup Repair Service Prices

Display	Menu	Input	Output
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<p>Load all the individual repair services available (a sample list based on the services mentioned in the description is given below) and ask the user to input the prices for each, followed by the menu.</p> <p>A. Belt Replacement  B. Engine Repair  C. Catalytic Converter Repair  D. Muffler Repair  E. Alternator Repair  F. Power Lock Repair  G. Axle Repair  H. Transmission Flush  I. Tire Balancing  J. Wheel Alignment  K. Compressor Repair</p>	<p>1. Setup prices  2. <a href="#">Go back</a></p>	<p>Take input from user about the service prices. After entering details for services A-K, choose option 1-2 from the Menu</p>	<p>If the user chooses 1, record all the information of car in the database. Then, go back to <b>Manager: Setup Service Prices page</b></p> <p>If the user chooses 2, go to the <b>Manager: Setup Service Prices page</b></p>
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Manager: Add New Employee

Display	Menu	Input	Output
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<p>Ask user to input the following details in the order shown below, followed by the menu.</p> <p>A. Name B. Address C. Email Address D. Phone Number E. Role F. Start Date G. Compensation (\$)</p>	<p>1. Add 2. <a href="#">Go Back</a></p>	<p>Take input from user about the new employee.</p> <p>After entering details A-G, choose option 1-2 from the menu</p>	<p>If the user chooses 1, create a new employee record for this service center and display the new employee ID number. Set the default password for this employee.</p> <p>They should be allowed to create accounts for only receptionists and mechanics. Also, each employee can only be associated with one service center.</p> <p>After creating the account, show a confirmation message and go back to <b>Manager: Setup Store page</b></p> <p>If the user chooses 2, go back to the <b>Manager: Setup Store page</b></p>
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## Mechanic pages

Mechanic: Landing

Display	Menu	Input	Output
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Display the menu	<ol style="list-style-type: none"> <li>1. <a href="#">View Schedule</a></li> <li>2. <a href="#">Request TimeOff</a></li> <li>3. <a href="#">Request Swap</a></li> <li>4. <a href="#">Accept/Reject Swap</a></li> <li>5. <a href="#">Logout</a></li> </ol>	Enter choice (1-5)	Display the correct page depending on choice 1-4. For 5, logout and return to the <b>Home page</b>
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#### Mechanic: View Schedule

Display	Menu	Input	Output
<p>Display the following details followed by the menu.</p> <p>A. The list of time slots when mechanic is booked for the service</p>	<ol style="list-style-type: none"> <li>1. <a href="#">Go back</a></li> </ol>	Enter choice 1	Go back to <b>Mechanic landing page</b>

#### Mechanic: Request TimeOff

Display	Menu	Input	Output
<p>Ask user to input the following details in the order shown below, followed by the menu,.</p> <p>A. Time slots mechanic wants to be off (indicated by week, day, time slot start and end slot ids)</p>	<ol style="list-style-type: none"> <li>1. Send the request</li> <li>2. <a href="#">Go back</a></li> </ol>	Enter choice 1-2	Display the status of the request, let user stay on the page to enter other requests and once done go back to <b>Mechanic: landing page</b>

### Mechanic: Request Swap

Display	Menu	Input	Output
<p>Ask user to input the following details in the order shown below, followed by the menu</p> <p>A. Timeslot range to swap (identified by day id, weekid, begin slot id, end slot id)</p> <p>B. Employee ID of a mechanic that is being requested for swap</p> <p>C. Timeslot range of the requested mechanic that is of interest</p>	<p>1. Send the request</p> <p>2. <a href="#">Go back</a></p>	<p>Enter choice 1-2</p>	<p>If option 1 is chosen, in order to be sent the request has to pass the basic validity checks. Displays the status of the request once after it is sent. Let user stay on the page to enter other requests (if there are any) and once done Go back to <b>Mechanic landing page</b></p>

### Mechanic: Accept/Reject Swap

Display	Menu	Input	Output
<p>Display the list of pending swap requests with the following details, followed by the menu,</p> <p>A. RequestID</p>	<p>1. <a href="#">Manage Swap Requests</a></p> <p>2. <a href="#">Go back</a></p>	<p>Enter choice 1-2</p>	<p>If 1, go to <b>Mechanic: Manage Swap Requests page</b> and if 2 go to <b>Mechanic landing page</b></p>

B. The Requesting Mechanic's name C. Timeslot range requested			
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#### Mechanic: Manage Swap Requests

Display	Menu	Input	Output
<p>Ask the user to input the following details in the order shown below, followed by the menu,</p> <p>A. The requestID</p>	<p>1. Accept swap 2. Reject swap <a href="#">3. Go back</a></p>	<p>Enter choice 1-3</p>	<p>If 1, make the appropriate changes to the schedules, remove from list of swap requests, update swap status in mechanic's record (record of mechanic who sent the request), show the status message and redirect to <b>Mechanic: Accept/Reject swap</b> page.</p> <p>If 2, make no schedule changes, update swap status in mechanic's record (record of mechanic who sent the request), show the status message, remove from list of swap requests, and redirect to <b>Mechanic: Accept/Reject swap</b> page.</p> <p>If 3, discard the input (if any) and redirect to <b>Mechanic: Accept/Reject swap</b></p>