

mechanics need databases too

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CS 340-400: Spr 2020

Project- Step 7 Final

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<http://flip3.engr.oregonstate.edu:5455/home>

Executive Summary

- The TA recommended that we carefully considered the implementation of having a DELETE function for all tables. We decided to leave the delete function for all entities since we have logic on server side to catch any MySQL errors and notify the user if they cannot delete a record because of a foreign key constraint or any other reason.
- Reviewers were initially confused by what we were trying to accomplish. This helped us realize that we needed to update our repairs table to repair_orders, which is the main tracking mechanism for the overall reason the car is in the shop, then we can add work orders (tracked in the composite table work_orders) that records the various tasks being done to the cars, the mechanic assigned to each task and start and end dates of the task.
 - Made work_orders a composite table with attributes moved from work_tasks (mechanic_id, start_date and end_date). This was to satisfy the requirement that when we delete our M:M task and repair orders relationship record, we cannot delete any record from the repair_orders or work_tasks tables. We also gave work_orders a PK of id, instead of using the FKs as the PK
 - Changed mechanics relationship with work_tasks (statuses). Mechanics has a M:M relationship with both repair_orders and work_tasks, which are both nullable.
- Removed Parts table since we only need to implement one M:M relationship

Project Outline

Mahinui auto shop, a single location, has seen record business in the last decade, repairing 50 or more cars on any given day. With more customers coming in by the day, keeping track of records has become a nightmare. The owner, Brad, has finally decided to upgrade his repair order workflow from pen and paper being passed between his 10 mechanics to a website database. Brad is looking to create a system for his mechanics to track the tasks involved with a car's repair, from diagnosis to customer pick up, and be able to view a display of the progress on the homepage. The website will allow users to:

1. Add Customer
2. Add Car
3. Add repair order to a car
4. Add work orders to repair order
 - a. Add work task to work order
 - i. Diagnosis, customer approval, order parts, repair, test drive and finally contact customer

- b. Add Mechanic to work order
5. Add end date to work order to complete
 6. Add new work order
 7. View on the website homepage the following display of all the cars currently being repaired at the shop and the current task being performed. This display is not intended to be part of the grading requirements, but more to show the usefulness of the database.

Mahinui Auto Shop Dashboard				
Customer Name	Car Description	Current Task	Start Date	Mechanic
Jason Bateman	2015 Honda Accord	Diagnosis	03/1/2020	Johnny
Charlize Theron	2014 Toyota Civic	Customer Approval	3/2/2020	Ben
Ryan Reynolds	2011 Honda Ridgeline	Order Parts	3/3/2020	Cameron
Scarlet Johansen	2009 Toyota Front Runner	Repair	3/4/2020	Peter
Jeff Bridges	2014 Fiat 500	Test Drive	3/5/2020	Frank

Database Outline

customers: records details about the customers who own the cars being repaired (Heather)

- id: INT, AUTO_INCREMENT, UNIQUE, NOT NULL, PK
- f_name: VARCHAR, NOT NULL
- l_name: VARCHAR, NOT NULL
- contact_no: VARCHAR, NOT NULL
- email_address: VARCHAR, NOT NULL
- relationship: a 1:M relationship between customers and cars is implemented with customer_id as a FK inside of cars, where a customer can have 0 to many cars, and a car can only have one customer.

cars: records details about the car being repaired (Chris)

- id: INT, AUTO_INCREMENT, UNIQUE, NOT NULL, PK
- customer_id: INT, FK
- license_plate: VARCHAR, NOT NULL
- model_year: YEAR, NOT NULL

- make: VARCHAR, NOT NULL
- model_name: VARCHAR, NOT NULL
- relationship: a 1:M relationship between cars and repair_orders is implemented with car_id as a FK inside of repair_orders, where a car can have 0 or more repair orders and a repair order can have only one car ; a 1:M relationship between customers and cars is implemented with customer_id as a FK inside of cars, where a car requires zero or one customer and a customer can have 0 or more cars

repair_orders: records details about the repair order being done on a car (Heather and Chris)

- id: INT, AUTO_INCREMENT, UNIQUE, NOT NULL, PK
- car_id: INT, FK NOT NULL
- date_received: DATE NOT NULL
- date_completed: DATE
- relationship: a M:M relationship between repair_orders and work_tasks and a M:M relationship between repair_orders and mechanics are both implemented with a composite table work_orders; a 1:M relationship between cars and repair_orders is implemented with car_id as a FK inside of repair_orders, where a repair order must have only 1 car, but a car can have 0 or more repairs

work_tasks: records the types of tasks that can be added to repair orders, these tasks are associated to repair orders through work orders (Heather)

- id: INT, AUTO_INCREMENT, UNIQUE, NOT NULL, PK
- name: VARCHAR, NOT NULL (Diagnosis, Customer Approval, Order Parts, Repair, Test Drive, Contact Customer)
- relationship: a M:M relationship between repair_orders and work_tasks and a M:M relationship between mechanics and work_tasks are both implemented with a composite table work_orders

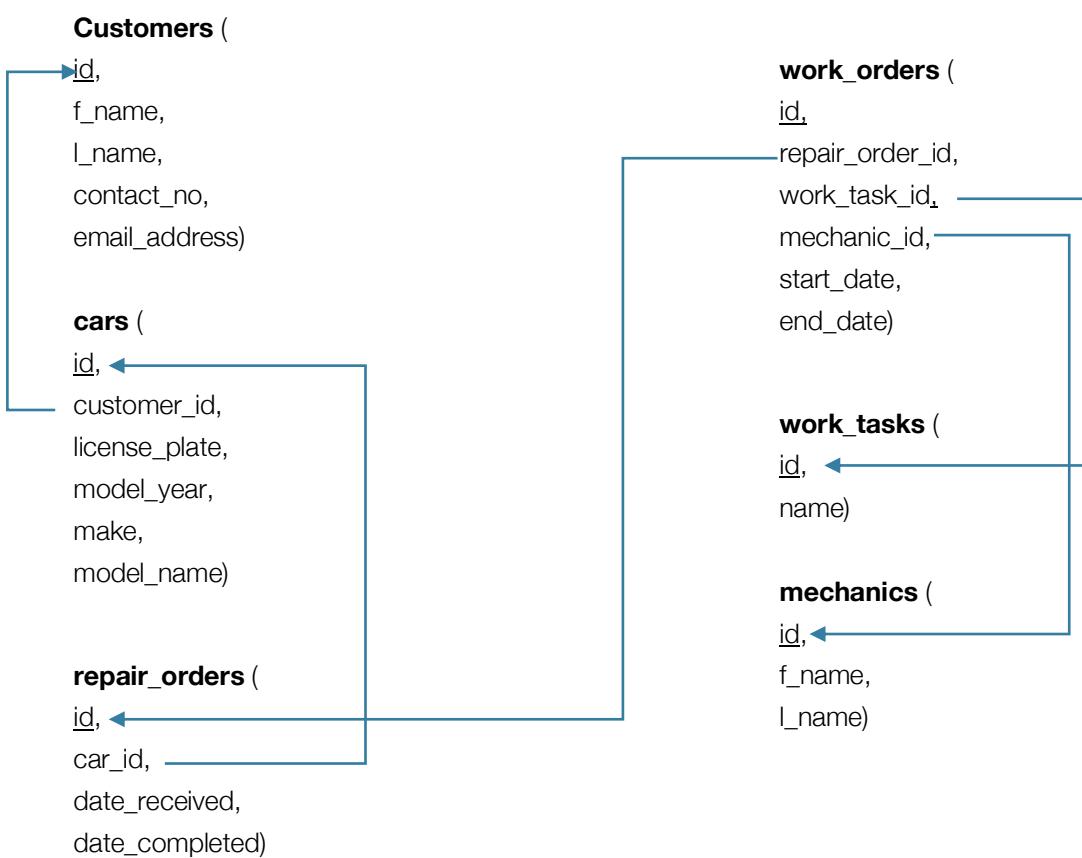
work_orders: composite table that records the tasks that have been added to the repair_orders and also tracks the mechanic responsible for the work order (Heather and Chris)

- id: INT, AUTO_INCREMENT, UNIQUE, NOT NULL, PK
- repair_order_id, NOT NULL FK
- order_task_id, NOT NULL FK
- mechanic_id: INT, NOT FK
- start_date: DATE NOT NULL
- end_date: DATE

mechanics: records details of the mechanic responsible for the work orders (Chris)

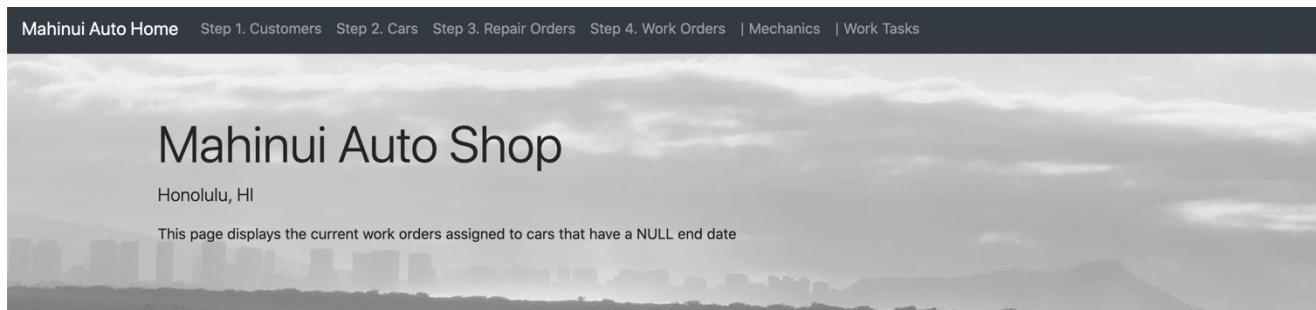
- id: INT, AUTO_INCREMENT, UNIQUE, NOT NULL, PK
- f_name: VARCHAR, NOT NULL
- l_name: VARCHAR, NOT NULL
- relationship: a 1:M relationship between mechanics and work order is implemented with mechanic_id as a FK inside of work_orders, where a mechanic can have 0 or more work_orders but a work order can only have one mechanic; a M:M relationship between repair_orders and mechanics and a M:M relationship between mechanics and work_tasks are both implemented with a composite table work_orders;

Schema



Screenshots

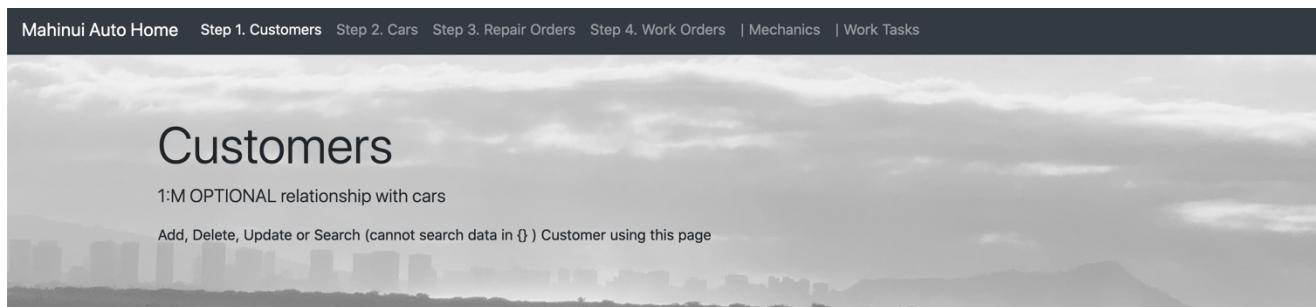
Dashboard: Visual purposes only, not meant to meet grading requirements



The screenshot shows the Mahinui Auto Shop dashboard. At the top, there is a navigation bar with links: Mahinui Auto Home, Step 1. Customers, Step 2. Cars, Step 3. Repair Orders, Step 4. Work Orders, Mechanics, and Work Tasks. Below the navigation bar is a large header image of a city skyline at sunset. The main title "Mahinui Auto Shop" is centered above the subtitle "Honolulu, HI". A sub-instruction below the subtitle reads: "This page displays the current work orders assigned to cars that have a NULL end date". Below this text is a table showing five work orders:

Customer Name	Car Description	Current Task	Task Start Date	Mechanic
Heather Fillerup	2014 Mazda Miata	Diagnosis	2020-05-10	Rob Stump
Chris Nelson	2019 Ferrari 488	Repair	2020-05-08	Pam Simpson
Heather Fillerup	2014 Fiat 500	Customer Approval	2020-05-07	Rob Stump
Simon Garfunky	2006 Honda Civic	Diagnosis	2020-05-07	Rob Stump
Austin Powers	1981 Toyota Truck	Diagnosis	2020-05-02	Jake Tiger

customers: READ/BROWSE/DISPLAY, DELETE and SEARCH/FILTER



The screenshot shows the "Customers" page. At the top, there is a navigation bar with links: Mahinui Auto Home, Step 1. Customers, Step 2. Cars, Step 3. Repair Orders, Step 4. Work Orders, Mechanics, and Work Tasks. Below the navigation bar is a large header image of a city skyline at sunset. The main title "Customers" is centered above a sub-instruction: "1:M OPTIONAL relationship with cars". Below this is another sub-instruction: "Add, Delete, Update or Search (cannot search data in {}) Customer using this page". At the bottom of the page is a table showing four customer entries:

Add Customer					
id	f_name	l_name	contact_no	email_address	
1	Chris	Nelson	398-394-0383	cnelson@gmail.com	Delete Update
2	Heather	Fillerup	398-234-5467	genius@ymail.com	Delete Update
3	Simon	Garfunky	398-938-9383	sg4life@nasa.com	Delete Update
4	Austin	Powers	398-440-1969	groovybaby@yea.com	Delete Update

customers: CREATE/INSERT/ADD NEW

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

New Customer

f_name



l_name

contact_no

email_address

customers: UPDATE

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Update Customer

f_name



l_name

contact_no

email_address

customers: SEARCH/FILTER

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Customers - filtered [back](#)

id	f_name	l_name	contact_no	email_address
1	Chris	Nelson	398-394-0383	cnelson@gmail.com

cars: READ/BROWSE/DISPLAY, DELETE and SEARCH/FILTER

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Cars

1:M OPTIONAL relationship with customers; 1:M relationship with repair_orders

Add, Delete or Search (cannot search data in {}) Car using this page

[Add Car](#)

id	customer_id	license_plate	model_year	make	model_name	<input type="text"/>	Search
1	1 { Chris Nelson }	tbh-002	2019	Ferrari	488	Delete	
2	2 { Heather Fillerup }	bad-124	2014	Fiat	500	Delete	
3	3 { Simon Garfunkly }	djh-459	2006	Honda	Civic	Delete	
4	4 { Austin Powers }	fjd-109	1981	Toyota	Truck	Delete	

cars: CREATE/INSERT/ADD NEW

Mahinui Auto Home Step 1. Customers **Step 2. Cars** Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

New Car

customer_id
0 (NULL)

license_plate
Enter license_plate

model_year
Enter model_year

make
Enter make

model_name
Enter model_name

[Submit](#) [Cancel](#)

cars: SEARCH/FILTER

Mahinui Auto Home Step 1. Customers **Step 2. Cars** Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Cars - filtered [back](#)

id	customer_id	license_plate	model_year	make	model_name
1	1 { Chris Nelson }	tbh-002	Ferrari	2019	488

repair_orders: READ/BROWSE/DISPLAY, DELETE and SEARCH/FILTER

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Repair Orders

M:M relationship with work_tasks via composite entity work_orders; 1:M relationship with cars;

Add, Delete or Search (cannot search data in {}) Repair Order using this page

id	car_id	date_received	date_completed		Search
1	1 { tbh-002 : 2019 Ferrari 488 }	2020-05-02	NULL	Delete	
2	2 { bad-124 : 2014 Fiat 500 }	2020-05-10	NULL	Delete	
3	3 { djh-459 : 2006 Honda Civic }	2020-05-11	NULL	Delete	
4	4 { fjd-109 : 1981 Toyota Truck }	2020-05-12	NULL	Delete	

[Add Repair Order](#)

repair_orders: CREATE/INSERT/ADD NEW

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

New Repair Order

car_id
1 (tbh-002 : 2019 Ferrari 488)

date_received
mm / dd / yyyy

date_completed
mm / dd / yyyy

[Submit](#) [Cancel](#)

Repair_orders: SEARCH/FILTER

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Repair Orders - filtered [back](#)

id	car_id	date_received	date_completed
1	1 { 2019 Ferrari 488 }	2020-05-02	NULL

work_orders: READ/BROWSE/DISPLAY and DELETE

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Work Orders

Composite entity: 1:M relationship with repair_orders; 1:M relationship with work_tasks; 1:M relationship with mechanics

Add, Delete or Search (cannot search data in {}) Work Order using this page

[Add Work Order](#)

id	repair_order_id	work_task_id	mechanic_id	start_date	end_date	<input type="text"/>	Search
1	1 {tbh-002 : 2019 Ferrari 488}	1 {Diagnosis}	1 {Jake Tiger}	2020-05-02	2020-05-03	Delete	
2	2 {bad-124 : 2014 Fiat 500}	1 {Diagnosis}	3 {Tommy Boyd}	2020-05-05	2020-05-07	Delete	
3	3 {djh-459 : 2006 Honda Civic}	1 {Diagnosis}	4 {Rob Stump}	2020-05-07	NULL	Delete	

work_orders: CREATE/INSERT/ADD NEW

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders **Step 4. Work Orders** | Mechanics | Work Tasks

New Work Order

repair_order_id
1 (tjh-002 : 2019 Ferrari 488)

work_task_id
1 (Diagnosis)

mechanic_id
1 (Jake Tiger)

start_date
mm/dd/yyyy

end_date
mm/dd/yyyy

[Submit](#) [Cancel](#)

work_orders: SEARCH/FILTER

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders **Step 4. Work Orders** | Mechanics | Work Tasks

Work Orders - filtered [back](#)

id	repair_order_id	work_task_id	mechanic_id	start_date	end_date
1	1 {tjh-002 : 2019 Ferrari 488}	1 {Diagnosis}	1 {Jake Tiger}	2020-05-02	2020-05-03
4	4 {fjd-109 : 1981 Toyota Truck}	1 {Diagnosis}	1 {Jake Tiger}	2020-05-02	NULL

mechanics: READ/BROWSE/DISPLAY, DELETE and SEARCH/FILTER

Mechanics

M:M relationship with repair_orders via composite entity work_orders

Add, Delete, Update or Search (cannot search data in {}) Mechanic using this page

Add Mechanic

id	f_name	l_name		Search
1	Jake	Tiger	Delete	Update
2	Bob	Painter	Delete	Update
3	Tommy	Boyd	Delete	Update
4	Rob	Stump	Delete	Update

mechanics: CREATE/INSERT/ADD NEW

New Mechanic

f_name
Enter f_name

l_name
Enter l_name

[Submit](#) [Cancel](#)

mechanics: UPDATE

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Update Mechanics

f_name

l_name

[Submit](#) [Cancel](#)

mechanics: SEARCH/FILTER

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Mechanics - filtered [back](#)

id	f_name	l_name
1	Jake	Tiger

work_tasks: READ/BROWSE/DISPLAY and DELETE

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Work Tasks

M:M relationship with repair_orders via composite entity work_orders

Add, Delete or Search (cannot search data in {}) Work Task using this page

id	name		Search
1	Diagnosis	Delete	
2	Customer Approval	Delete	
3	Order Parts	Delete	
4	Repair	Delete	

[Add Work Task](#)

work_tasks: CREATE/INSERT/ADD NEW

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

New Work Task

name
Enter name

Submit Cancel

work_tasks: SEARCH/FILTER

Mahinui Auto Home Step 1. Customers Step 2. Cars Step 3. Repair Orders Step 4. Work Orders | Mechanics | Work Tasks

Work Tasks - filtered [back](#)

id	name
1	Diagnosis