#Database Design

for Used Car Ecommerce Website

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Project Background & Mission Statement

Project Background

1. Each app user is able to promote more than 1 used car.
2. Before user can create an advert. user has to complete his identity for example: name, contact info and location address.
3. Their product will be shown as ads in our website.
4. The ads should contain title, detailed information on the product and contact detail.
5. The product information should include: car brand, car model, car transmission (whether manual or automatic), body type and manufacturing year.
6. Other description like color, mileage etc. is optional.
7. Each user is able to find cars based on seller location, car brand and body type.
8. If user is willing to purchase the car, user can offer a bid price, only if seller permit bid feature.
9. The transaction itself is done outside of website and is out of the scope of this project.

Mission Statement

The purpose of Used Car Ecommerce Website is to maintain the data generated and facilitates user to post, view advertisement and make a deal.

02

Designing Database

2.1 Table Structure

1. user		
user_id	CK	PK
password		
user_name		
phone_number		
social_media_address		
domicile_address		
city_id		FK
date_created		

2. ads		
ads_id	CK	PK
title		
description		
user_id		FK
date_created		

3. province		
province_id	CK	PK
province		
country_id		FK
date_created		

4. city		
city_id	CK	PK
city		
province_id		FK
coordinate		
date_created		

5. country		
country_id	CK	PK
country		
date_created		

6. car		
car_id	CK	PK
color		
mileage		
permit_bid		
mfg_year_id		FK
model_id		FK
ads_id		FK
price		
date_created		

7. mfg_year		
mfg_year_id	CK	PK
mfg_year		
date_created		

8. model		
model_id	CK	PK
model_name		
transmission_id		FK
body_id		FK
brand_id		FK
date_created		

9. transmission		
transmission_id	CK	PK
transmission		
date_created		

10. body		
body_id	CK	PK
body		
date_created		

11. brand		
brand_id	CK	PK
brand		
date_created		

12. bid		
bid_id	CK	PK
bid_price		
car_id		FK
user_id		FK
date_created		

	user	ads	city	province	country	car	mfg_year	model	transmission	body	brand	bid
user		1:N										1:N
ads						1:N						
city	1:N											
province			1:N									
country				1:N								
car												1:N
mfg_year						1:N						
model						1:N						
transmission								1:N				
body								1:N				
brand								1:N				
bid												

2.3 Determine Business Rule

Tabel: user

- Each user has to fill their identity (all field in user table is required and can't be empty, except social media address)
- Relation between city is mandatory
- If a user is deleted, all related records should be deleted

NOT null for field:

- user_id
- username
- password
- phone_number
- domicile address
- date_created

Relation between city:
ON DELETE CASCADE, ON UPDATE CASCADE

2.3 Determine Business Rule

Tabel: province, city, country

- Each user has to fill city, province and country field.

NOT null for field:

- city_id, city, coordinate
- province_id, province
- country_id, country
- date_created

Relation between city, province and country:
ON DELETE NO ACTION, ON UPDATE CASCADE

2.3 Determine Business Rule

Tabel: ads

- Each user is able to post ads but isn't required.
- If a user post ads, they have to fill the title, description and all details about car except color and mileage.

NOT null for field:

- ads_id
- title
- description
- User_id
- date_created

Relation between car:
ON DELETE NO ACTION, ON UPDATE CASCADE

2.3 Determine Business Rule

Tabel: car

- Each ads have to have at least 1 car
- The car detail should have every field filled except color and mileage.
- The permit bid default is FALSE and when TRUE, other user can post bid for the car (business rule applied on backend)
- If a car is deleted, all records related to the car is also deleted.

NOT null for field:

- car_id, permit_bid, mfg_year_id, model_id, ads_id, date_created, price

Able to be null field:

- color, mileage

Relation between mfg_year, model , ads and bid:
ON DELETE CASCADE, ON UPDATE CASCADE

2.3 Determine Business Rule

Tabel: mfg_year

- Each car always have detail about its manufacturing year

NOT null for field:

- Mfg_year_id, mfg_year, date_created

ON DELETE NO ACTION ON UPDATE CASCADE

2.3 Determine Business Rule

Tabel: model

- Each car always have detail about its model

NOT null for field:

- model_id, model_name, transmission_id, body_id, brand_id, date_created

Relation between transmission, body, and brand:
ON DELETE NO ACTION, ON UPDATE CASCADE

2.3 Determine Business Rule

Tabel: bid

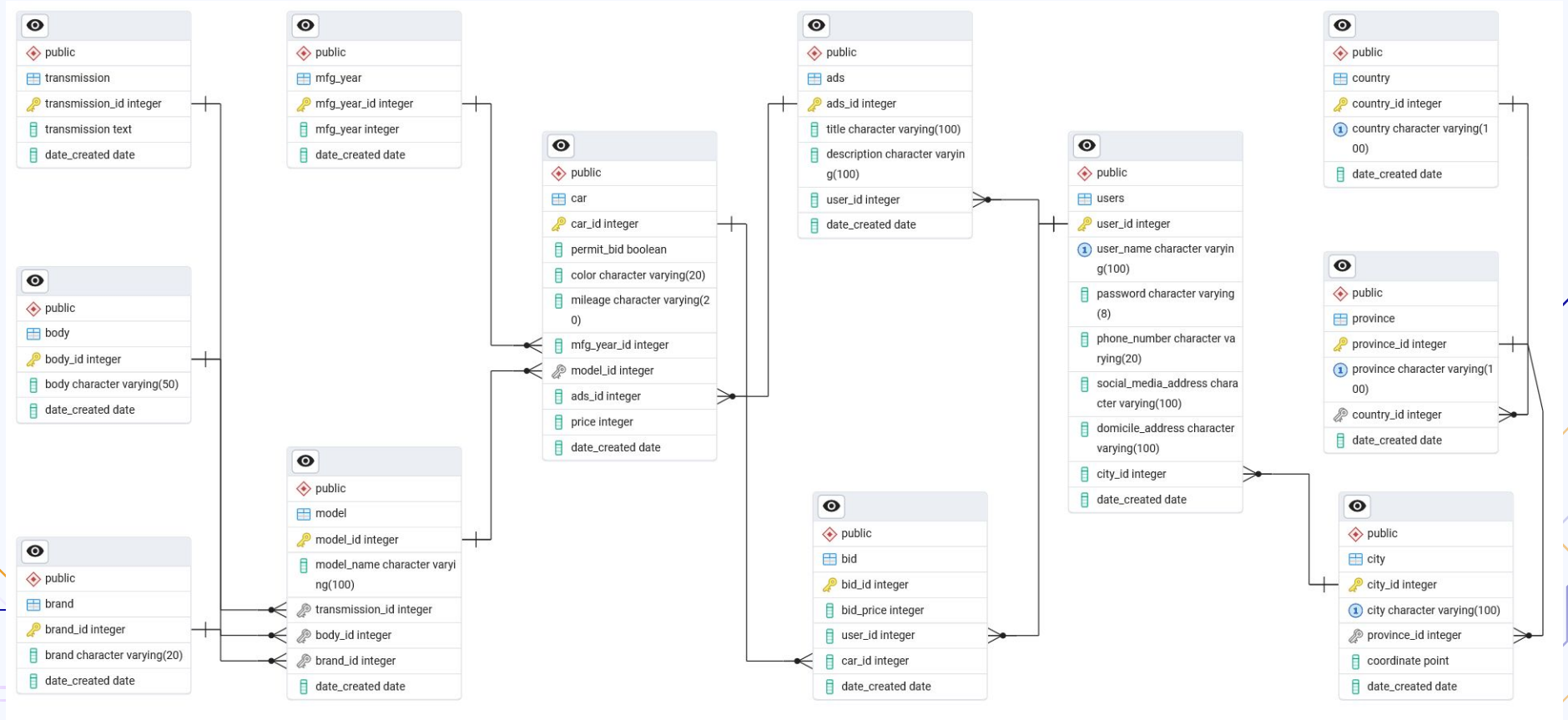
- Each car can have multiple bids if the ad poster permit their car to be bid
- Bid_price should have value > 0

NOT null for field:

- Bid_id, bid_price, user_id, car_id, date_created

Relation between user, car
ON DELETE CASCADE, ON UPDATE CASCADE

2.4 Implementing Relational Database



03

Populating Database

3.1 Create Dummy Data - Dependencies Table

Table structure is created in pgAdmin4, from the least dependencies. Link .sql

Dummy data is created using python faker. The latitude and longitude of city is derived from geopy.Nominatim. Link .ipynb

The dummy data is then imported to pgadmin4. Link .sql

Table Name	Num Dependencies
users	1
ads	1
city	1
province	1
country	0
car	3
mfg_year	0
model	3
transmission	0
body	0
brand	0
bid	2

04

Database Backup

4.1 Database Backup

Backup is created by using backup option in pgAdmin4. The file is stored in .sql. Link

05

Test Query

5.1 Transactional Query (Query Link)

Below are the questions, the links are .csv files of the answer

1. Find car manufactured above year 2015
2. Add 1 entry for car bid
3. Find car advertised by one of user
4. Find car detail based on keyword ‘Yaris’
5. Find nearest car advertised from one of user

5.2 Analytical Query (Query Link)

Below are the questions, the links are .csv files of the answer

1. Rank car model popularity based on bid count
2. Compare car model average price per city
3. For one car model, display bidding history by each user
4. Compare average bid price and the average advertised price for each model
5. For one model, print average bid price for 6 month

Thanks!

Do you have any questions?

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