

Kazıklan-ma

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1. Main text

Kazıklan-ma is a car selling website, designed to eliminate price hike of pre-owned vehicles. In Turkey, vehicle manufacturers updated their price lists multiple times due to the devaluation of Turkish Lira and increased taxes. In the same period, prices of pre-owned vehicles had a hike so steep that used cars were being listed for more expensive numbers than the manufacturers' price listings. This unusual movement can be explained in two reasons.

First, as the lira lost its value against Dollar and Euro, manufacturers had to update their prices for vehicles. Combined with the decreasing purchasing power of an average citizen, result of the change meant number of cars being shipped to Turkey were lowered. Therefore, during the Covid-19 times, dealers run out of new vehicles. Using this opportunity, car owners started to list their vehicles for prices that were much higher than official prices.

Second, this tipping point started a meddling game for car values as different owners were increasing their listing prices against each other.

1.1 Purpose

Kazıklan-ma tries to prevent value of second-hand cars to be higher than the brand new ones by preventing sellers from entering higher numbers than the official listings and displaying seller's value alongside with the dealer and average ones.

1.2 Platforms

Kazıklan-ma is written in python with flask.

The application depends on a postgresql server, hosted on Heroku; hence, eliminating the need to initialize a local database and alter the connection details. However, if desired, all the commands to create the necessary tables are available on GitHub.

SQLAlchemy is used for the connection between the app and the database.

1.3 Database

In the postgresql database, user table is used to store id username and password of each user. Same id is used to keep additional information about user in the table users_info.

Model table holds models of each brand. A new model can be added using admin's panel. Then, Vehicle table stores additional information about aforementioned model such as transmission, package, engine size, dealer price and so on. A single model can have more than one entity in the Vehicle table with different prices. This reflects the real-world car prices as one model's price first varies according to the engine size, then to the transmission and finally to the package.

Advertisement table is for listings. When a user creates a new listing by selecting one of the predefined vehicles and writes details about his/her own car such as damage, kilometer and color, the listing is being added to the Advertisement table;

1.4 Listings

When a seller adds a new listing, it will be displayed on the home screen to all users. If a buyer is interested in the ad, s/he can get every other information about the listing by pressing on the details button on the far right of each row. This opens a new page that gives all the information from the vehicle table (vehicle's specifications). Attributes of this page are specified in Section 1.2. After selecting a listing, user can also scroll at other adverts of the same seller.

1.5 User Types

There are 2 types of users in kaziklan-ma.

First, Admin has the authority to create new car brands and models, add their technical specifications and put a dealer's price for each model.

Second, a regular user can see all the listings in the site in the home screen. Clicking on the Details button will show the remaining information about the listing itself, vehicle's technical details such as the number of cylinder, horsepower, and seller's name alongside seller's phone number. Details screen also displays dealer's price and the average price of all listings for the specified model right next to the seller price.

1.6 Forms

1.6.1 Both register and login screens use table Users, which can be created using the code below

```
CREATE TABLE users(  
  id SERIAL PRIMARY KEY,  
  username VARCHAR(25) UNIQUE NOT NULL,  
  hashed_pswd TEXT NOT NULL  
);
```

Kaziklan-ma

Get started!
First time here? Register

Username

Password

Confirm password

Create

Already registered? [Click here](#) to login.

Kaziklan-ma

Login now!
Enter your username and password

Username

Password

Login

Haven't registered yet? [Click here](#) to register.

Fig. 1. (a) Registration screen; (b) Login screen

- 1.6.2 After selecting a username and a password, panel below requires user to enter personal information. With the id sent from the newly added entity to the Users table and information user provides, this screen creates a new entity in the users_info table. Users_info table can be created with the SQL code below

```
CREATE TABLE users_info
(
  users_id SERIAL REFERENCES users(id),
  name VARCHAR(100),
  surname VARCHAR(100),
  city VARCHAR(150),
  district VARCHAR(100),
  phone VARCHAR(20),
  mail VARCHAR(150),
  user_score int,
  FOREIGN KEY(city) REFERENCES city(city_name)
);
```

The screenshot shows a web application interface. At the top, a red message bar states "User created successfully. Now, please add personal info". Below this is a blue navigation bar with links: "+ New Advert", "Your Adverts", "Profile", "Filter", and "Logout". The main content area is light gray and contains a white form titled "New information about your profile". The form has the following fields: "Name", "Surname", "Select a city" (a dropdown menu), "District", "0-5XXX-XXXX-XXXX" (a phone number field), and "mail". At the bottom of the form is a blue "Add" button.

Fig. 2. Form to fill personal information

- 1.6.3 After logging in or registration, user is sent to the home screen which displays entities from the table Advertisement. In order to be simple, home screen only displays color, km, year, price and date of advert. Model, package and transmission are shown from the Vehicle table by filtering according to the foreign key vehicle_no in Advertisement. Same principle applies for the seller. Instead of showing the seller_id from Advertisement, seller's name is fetched from Users_info table.

+ New Advert1 99 Your Adverts

Profile Filter Logout

Model	Package	Transmission	Color	Km	Year	Price	Seller	Date of advert	
Tofas-Dogan slx	Ultra luks	Manual	Yellow	250000	2019	70000	Test	2020-12-07	Click For Details
BMW-430	M	Automatic	Blue	4800	2020	960000	Cenk	2020-12-08	Click For Details
BMW-420	M	Automatic	Blue	1000	2020	100000	Test	2020-12-08	Click For Details
volvo-XC90	2.0 B5 Inscription	Automatic	Dark Blue	185000	2020	960000	Elif Nur	2020-12-08	Click For Details
Mercedes-G 63	Avantgarde	Automatic	Black	200000	2020	3700000	Elif Nur	2020-12-08	Click For Details
audi-a5 coupe	1.8 TFSI	Automatic	Black	213000	2020	430000	Elif Nur	2020-12-08	Click For Details
audi-a3	1.6 TDI	Automatic	Black	120000	2020	298000	Berk	2020-12-08	Click For Details
BMW-430	M	Automatic	Green	279000	2020	645000	Berk	2020-12-08	Click For Details
audi-a3	1.6 TDI	Automatic	White	145000	2020	312000	Yigit	2020-12-08	Click For Details
Mercedes-e250	elite	automatic	Black	230000	2020	382000	Irem	2020-12-08	Click For Details
Yamaha-T-max	None	Automatic	Black	120000	2020	177000	Irem	2020-12-08	Click For Details
audi-a5 coupe	1.8 TFSI	Manual	White	200000	2020	300000	Irem	2020-12-08	Click For Details
Yamaha-T-max	None	Automatic	Black	0	2020	199999	Ataberk	2020-12-08	Click For Details

Fig. 3. Home screen

- 1.6.4 If a listing is selected using the “Click for details” button, user is redirected to detailed_Adverts page. In order to show only the selected advert, Advertisement table is filtered with the selected listing’s ad_no. In the form below, Model, Package, Transmission, Drive-Train, Engine-size, Cyclinder Number, Power and Dealer Price are shown from Vehicle table where vehicle_no matches the foreign key in the advertisement table. Color, Km, Year, Damage, Warranty, Exchange and Seller Price are the attributes that the user enters when creating a new advert. Aformentioned attributes are held inside the Advertisement table. Date of advert is added automatically to advertisement table when a user creates a new listing. Average price is calculated for each vehicle by diving the sum of seller prices to the number of advertisements both of which are filtered for each vehicle_no.

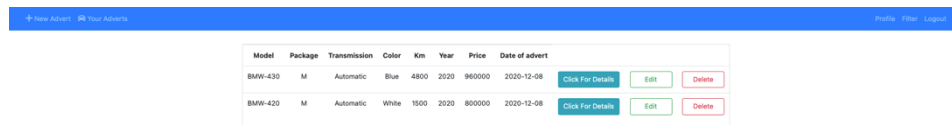
[+ New Advert](#) [📁 Your Adverts](#) [Profile](#) [Filter](#) [Logout](#)

Model	BMW-420
Package	M
Transmission	Automatic
Drive-Train	rear wheel
Engine Size	2.0 cc
Cyclinder Number	6
Power	315 hp
Color	White
Km	1500
Year	2020
Damage	20000
Warranty	Yes
Exchange	No
Seller Price	800000 TL
Dealer Price	820000 TL
Average Price	450000.0 TL
Seller name	Cenk-Gok
Phone	0-500-000-0000
Date of advert	2020-12-08

Seller's other adverts

Fig. 4. Detailed listing page

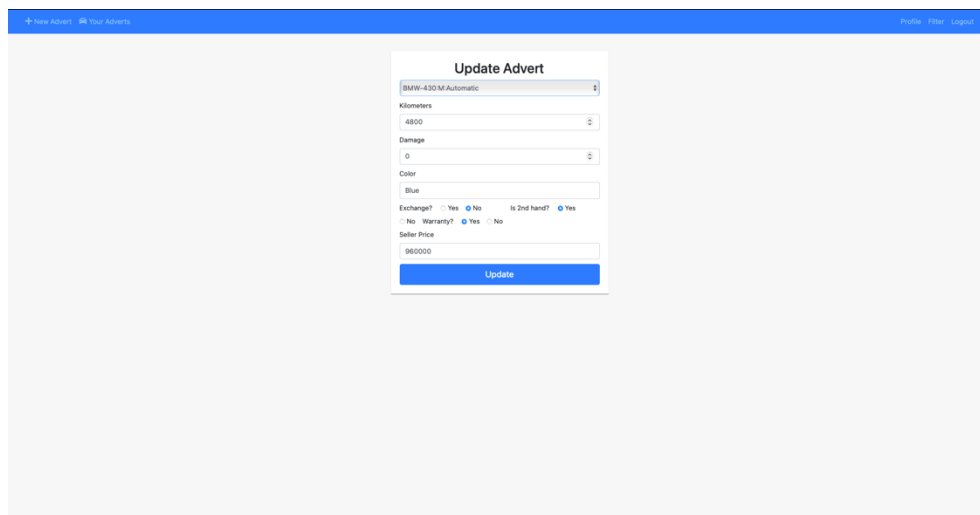
- 1.6.5 “Your listings” button on the menu bar shows the listings of the active user by matching current user’s id (from the Users table) to the seller_id attribute inside the advertisement page.



Model	Package	Transmission	Color	Km	Year	Price	Date of advert			
BMW-430	M	Automatic	Blue	4800	2020	960000	2020-12-08	Click For Details	Edit	Delete
BMW-420	M	Automatic	White	1500	2020	800000	2020-12-08	Click For Details	Edit	Delete

Fig. 5. Your listings

- 1.6.6 Clicking “Edit” button inside “Your Listings” page sends the seller to a page to update selected listing. To do so, ad_no is retrieved from the previous page.



New AdvertYour AdvertsProfileFilterLogout

Update Advert

BMW-430 M Automatic

Kilometers4800

Damage0

ColorBlue

Exchange?☐ Yes ☒ No

Is 2nd hand?☒ Yes ☐ No

Warranty?☒ Yes ☐ No

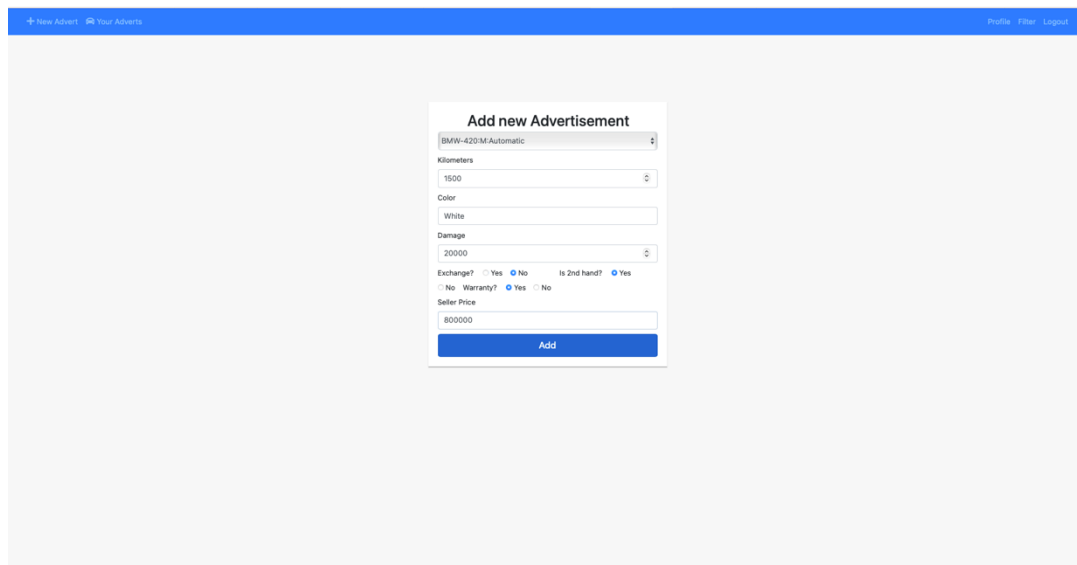
Seller Price960000

Update

Fig. 6. Update advert

- 1.6.7 Clicking on “Delete” button from your advert page removes the listing entity from table Advertisement.

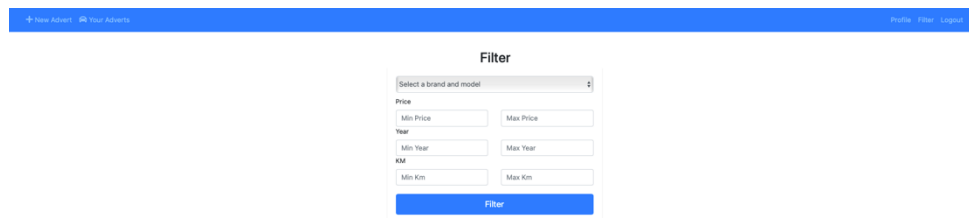
- 1.6.8 By clicking on “New Advert”, users can add a new entity to table advertisement. First dropdown lets users choose a car from table vehicle. Information about the car user chooses in this screen is used to display technical specifications about the car in the home screen, your adverts and detailed adverts forms, and its dealer price in Detailed Advert page.



The screenshot shows a web application interface with a blue header bar containing navigation links: "New Advert", "Your Adverts", "Profile", "Filter", and "Logout". The main content area is light gray and features a white form titled "Add new Advertisement". The form includes a dropdown menu for "BMW-420iM Automatic", a "Kilometers" input field with "1500", a "Color" input field with "White", a "Damage" input field with "20000", and two radio button groups: "Exchange?" (Yes/No) and "Is 2nd hand?" (Yes/No). There is also a "Seller Price" input field with "800000". A blue "Add" button is at the bottom of the form.

Fig. 7. Add a new advert

- 1.6.9 Clicking on filter opens the page as shown in figure 8. This screen allows user to narrow down his/her search for a model by specifying price, km or a year. After selecting a car from the dropdown, user may leave the textboxes empty or fill as much as s/he likes.



The screenshot shows a web application interface with a blue header bar containing navigation links: "New Advert", "Your Adverts", "Profile", "Filter", and "Logout". The main content area is light gray and features a white form titled "Filter". The form includes a dropdown menu for "Select a brand and model", a "Price" section with "Min Price" and "Max Price" input fields, a "Year" section with "Min Year" and "Max Year" input fields, and a "KM" section with "Min Km" and "Max Km" input fields. A blue "Filter" button is at the bottom of the form.

Fig. 8. Filtering

- 1.6.10 Clicking on “Profile” button from the menu bar will redirect user to a profile page where his/her personal information will be displayed. Data about the user is taken from the users_info table by using the active session’s user id. Edit button redirects user to another page where each of his/her personal information can be updated.

The image displays two screenshots of a web application's profile management interface. Both screenshots show a form with the following fields: Name, Surname, City, District, Phone, and Mail. The form is set against a light gray background with a blue header bar at the top. In the first screenshot (a), the form is titled 'Profile' and has a yellow 'Edit' button. In the second screenshot (b), the form is titled 'Update Profile' and has a blue 'Update' button. The form fields are pre-filled with example data: Name: Cenk, Surname: Gök, City: Ankara, District: Çankaya, Phone: 0 312 000 0000, and Mail: cenk@bank.com.

Fig. 9. (a) Profile screen; (b) Edit profile screen

2. DFD & HIFO

2.1. DFD

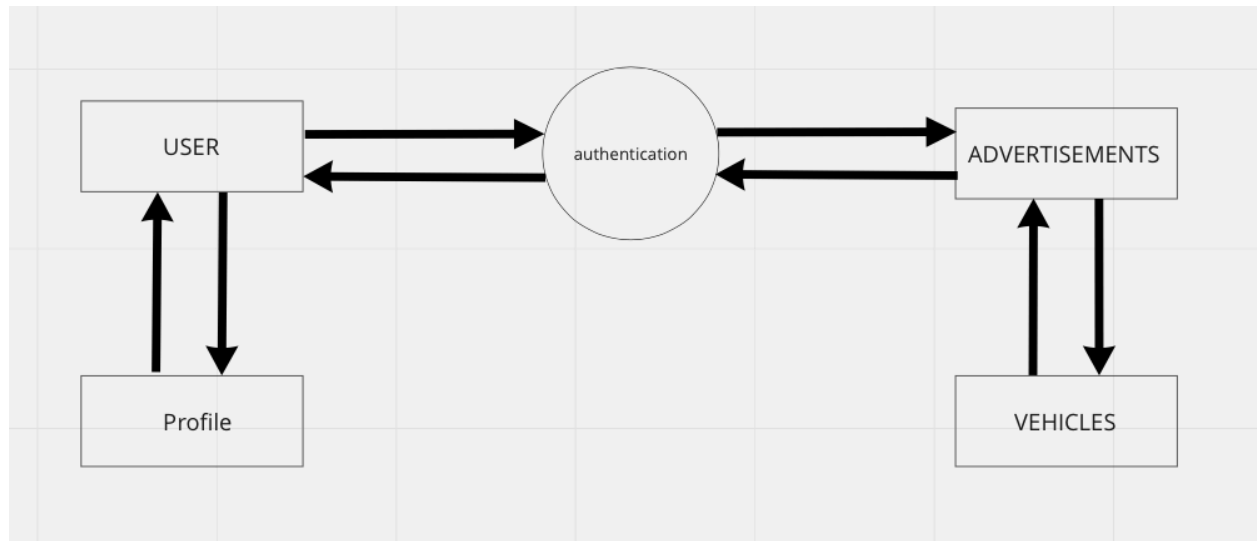


Fig. 10. DFD of the project

2.2. HIFO

2.2.1. Register & Login

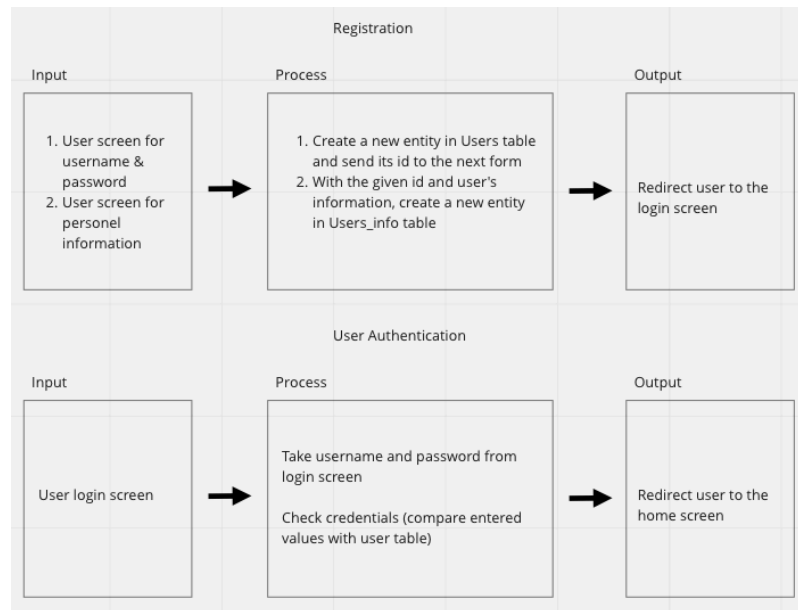


Fig. 11. HIFO for register & login screen

2.2.2. Adding & filtering adverts

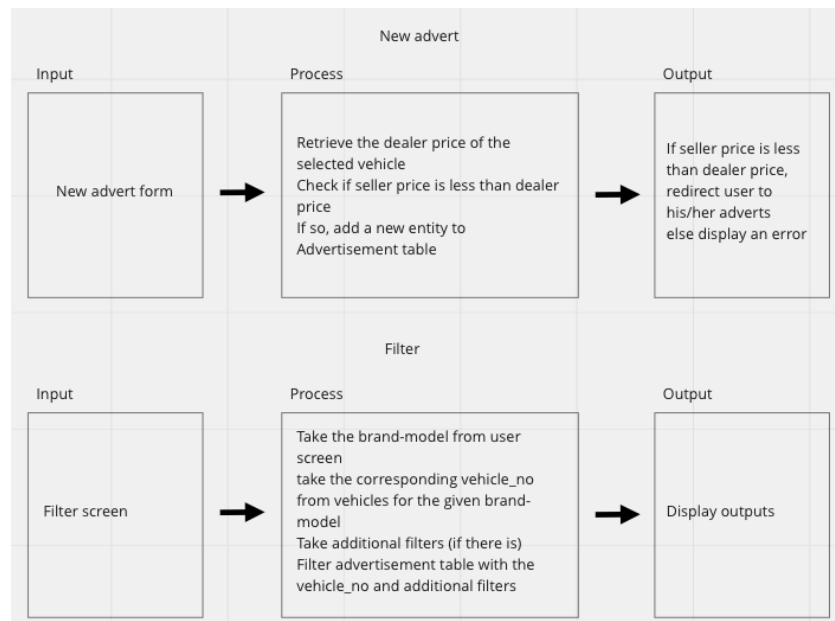
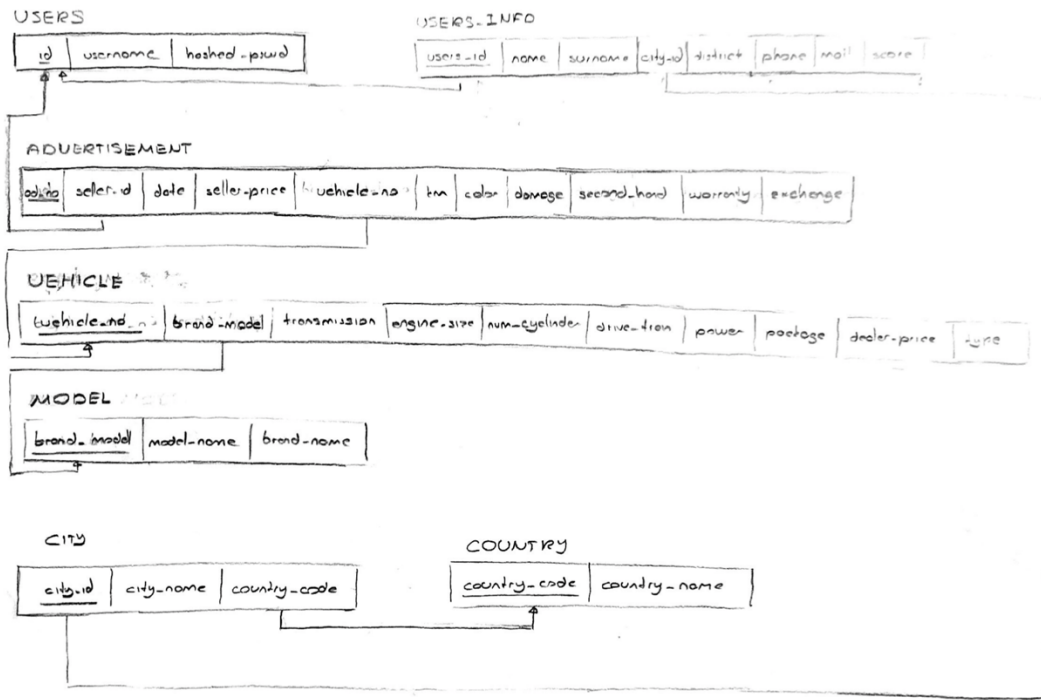


Fig. 12. HIFO for adding & filtering adverts

Appendix A.

A.1. Logical Design



A.2. ER/EER Diagram

