# פרויקט יישומי בפיתוח אפליקציות Final Report This document summarizes the work done in my Car-Market project – a web platform for listing, browsing, and managing cars for sale, with user authentication, comments, private messages, and an admin dashboard. 1. Why I Chose This Topic

I imagined a clean platform where users could register, list their cars with images, and communicate with potential buyers directly. The project turned out close to my vision, with additional features such as comments on cars and an admin panel for managing users.

**2. Choice of Technologies**

I used VS code as my work environment, I found VS code very convenient for my project, connected it really easy to GitHub with Git and update through the terminal.  
I used Node.js for the backend because it is lightweight, fast, and worked great for my needs.   
MongoDB with Mongoose was chosen as the database to handle flexible car and user data.  
I considered to use SQL instead of the MongoDB but I found MongoDB better choice for my project for it's scalability and flexibility.  
Most of the functions in this project are create, read, update, delete, and MongoDB is particularly convenient for such operations thanks to Mongoose, which provided a clean abstraction layer.  
Multer was integrated for file uploads, allowing users to add images of the cars they want to sale.  
The frontend was built with HTML, CSS, and JavaScript for simplicity and direct integration with the backend API.

**3. design and implementation**

My project was designed around three main models: User, Car, and Message.   
I planned the implementation in stages:   
First I wrote a shallow server.js file to connect to Node.js and MongoDB,  
then I wrote the files in the public folder which are simple frontend files to see that something is running.   
After that I started to improved the server file and created a user database with user authentication (register, login).  
After that, I improved the design with style.css file where I designed all the buttons that I have in my project as well as the login and registration forms. style.css helped me to make sure that all pages share the same clean and user-friendly design.  
Afterwards, I consistently improved the project by adding: car database (adding, editing, deleting, with image upload (optional)), comments on cars, private messaging between users, and admin management.  
My last 2 updates are related to passwords,  
One update is to require a strong password upon registration (At least 8 characters where at least one of the characters is a number, a capital letter and a symbol)  
and the other is to delete the admin password from the code.  
The backend exposes RESTful routes while the frontend interacts with them using fetch().  
I did tests after every small update.  
Every time I changed something, I immediately restarted the server to check if the update I made actually worked well and worked as I want.

**4.** **What I learned during the project**

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**4.** **ChatGPT**

To be completely honest, ChatGPT was a great help throughout this project. I worked with it continuously, and it guided me through many challenges I encountered.   
For example, it helped me implement the image upload feature with a preview (user can see how the image will be) before adding a car, and it also helped me to connect each uploaded car to the specific user who created it.   
It was also very helpful in building the chat functionality for each car in the web-site, as well as in setting up the initial MongoDB connection and configuring GitHub integration so I could update directly from the terminal instead of manually.   
ChatGPT saved me a lot of time: whenever I wanted to add something new to the project and I didn’t know how to implement it, I simply asked ChatGPT, and it taught me the subject I needed with clear, step-by-step explanations. I feel that ChatGPT helped me truly understand how the subjects I ask about works. Even after ChatGPT assisted me in writing the code of something, if I wanted to make changes later, I was able to do so entirely on my own.

**4.**  **if I had more time**

If I had more time, I would like to add advanced search and filtering of cars, allowing users to quickly find vehicles by manufacturer, model, year and price range.  
Also I would implement password encryption using bcrypt which storing hashing password instead of storing the password as is.