PORTFOLIO

2025

Hello,
I'm Nursena Bitirgen

Hello, I'm Nursena. I'm a computer engineer who is developing himself in the field of data engineering and is passionately advancing on this path.

I have gained experience in both academic and professional projects on Python-based data processing, ETL processes and database management. I managed to reduce data anomalies by 32% with the Python-based automation tools I developed at Mercedes-Benz.

I am competent in working with SQL (PostgreSQL, MySQL) and NoSQL (MongoDB) databases and performing data analysis using Pandas/NumPy libraries.

I have carried out academic projects with big data tools and am constantly eager to learn new technologies.

I look forward to contributing to data infrastructure projects by combining my problem-solving skills, analytical thinking and technical knowledge.

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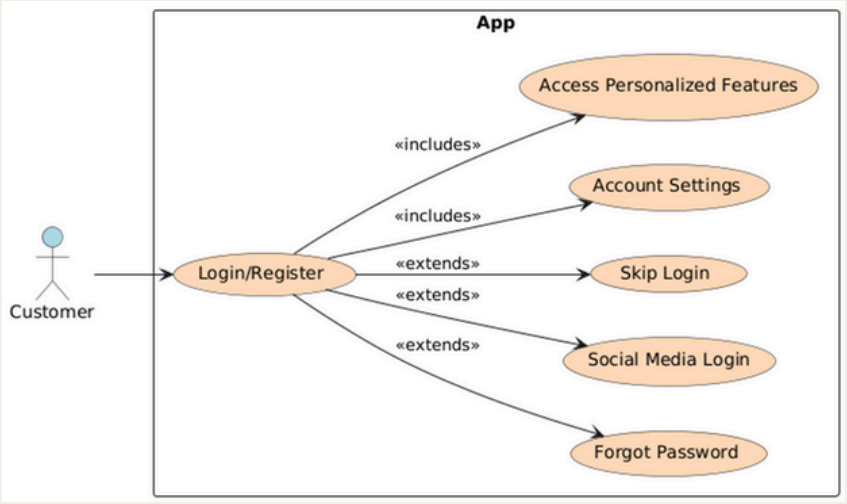
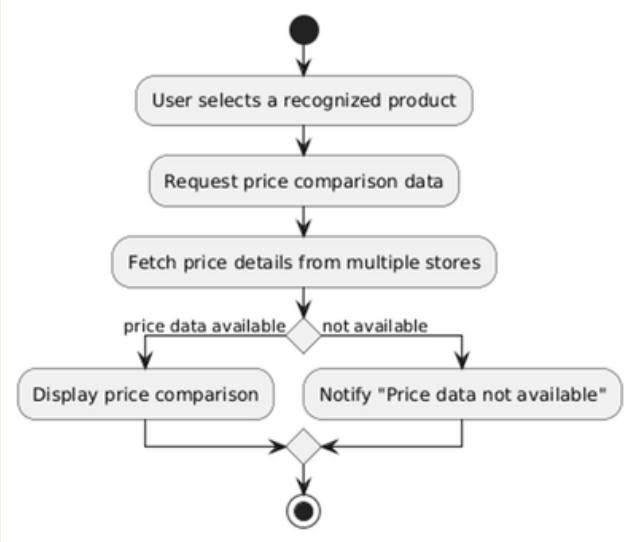
iProViS : Intelligent Product Vision System

What?

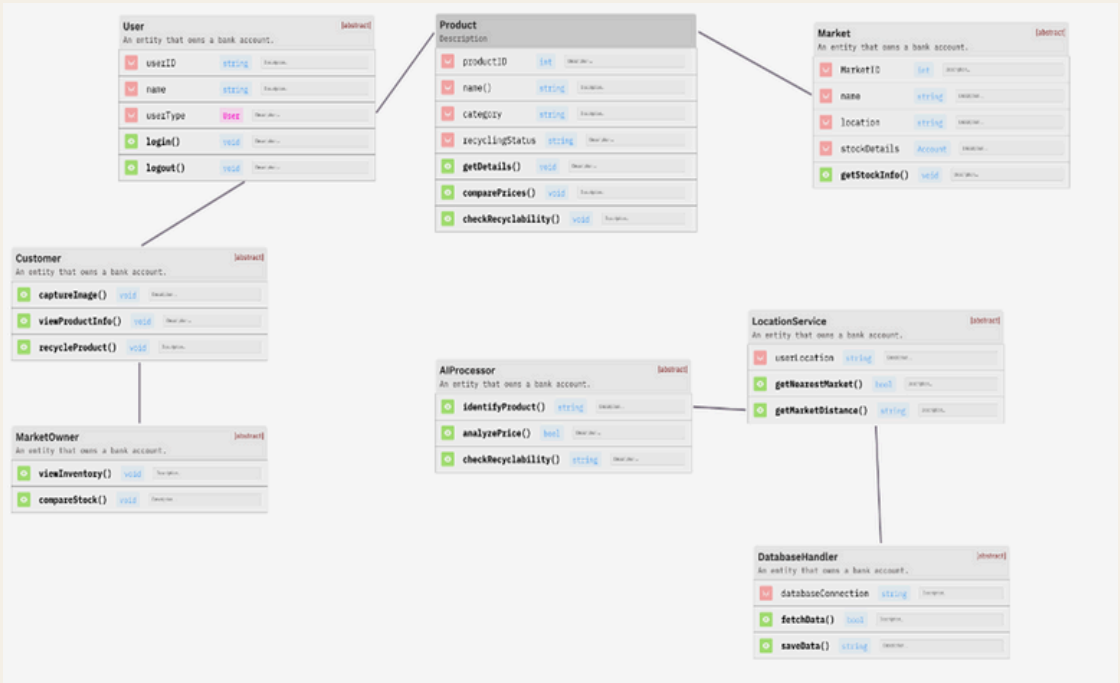
The iProVis system harnesses computer vision, object detection, and AI-based models like TensorFlow, YOLOv8, and OpenCV to revolutionize product recognition. By analyzing images captured via a smartphone camera, the system identifies products in real time, eliminating the need for barcodes or QR codes. YOLOv8 ensures fast and accurate object detection, while OpenCV handles image processing, and TensorFlow powers the AI model training. This combination enables the system to recognize a wide range of products across categories like electronics, clothing, and food.





Result

iProVis revolutionizes retail by combining computer vision and AI-based object detection to enable real-time product recognition and price comparisons across stores, empowering users to make informed decisions. If a product is unavailable in-store, it seamlessly recommends online alternatives. The system also integrates with smart recycling systems, identifying recyclable packaging and providing details like weight and fullness to promote eco-friendly practices. With multilingual support and robust API integration, iProVis caters to diverse users and connects seamlessly with external platforms. Built using Agile methodology and Scrum framework, it ensures adaptability and transparency, delivering a cutting-edge solution that enhances shopping experiences while supporting sustainability goals.



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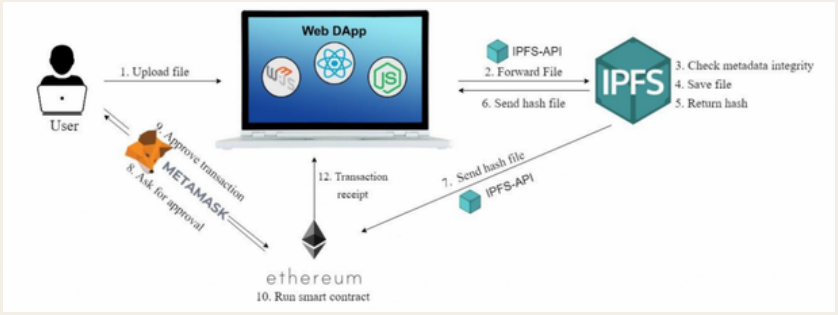
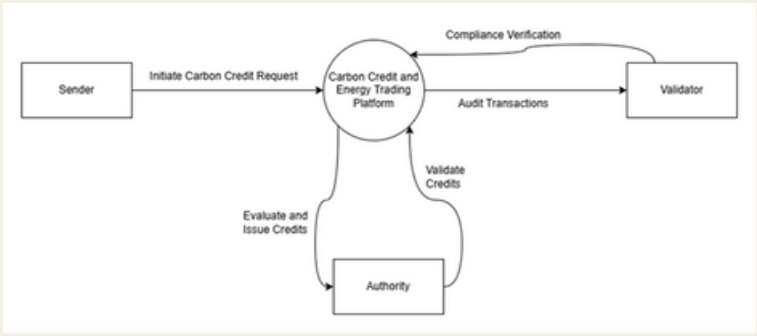
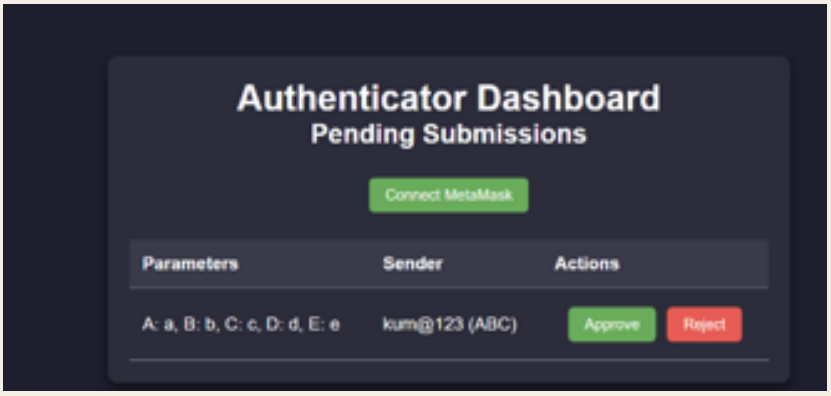
Blockchain-Based Carbon Credit Management

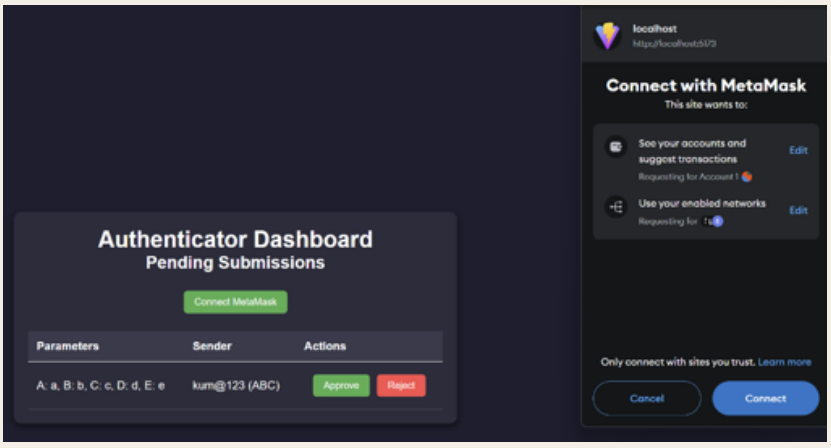
What?

- EnerGia is a European Union project blockchain based platform that transforms carbon credits into NFTs, ensuring transparency, security, and traceability in carbon credit issuance and trading. Using smart contracts written in Solidity and IPFS for secure decentralized storage, EnerGia supports sustainability and regulatory compliance, offering a seamless React frontend for easy user interaction.









Result

EnerGia delivers a transformative solution for carbon credit management, addressing key challenges in the fight against climate change. By utilizing blockchain and NFTs, the platform ensures that carbon credits are securely issued, validated, and traded, minimizing fraud and administrative overhead. The integration of IPFS guarantees data integrity and accessibility, while the React-based frontend and Node.js backend provide a user-friendly and scalable experience. EnerGia not only fosters trust among stakeholders but also supports global sustainability initiatives by promoting transparent and efficient carbon credit trading. This innovative platform sets a new standard for environmental responsibility, empowering industries to reduce their carbon footprint and contribute to a greener future.

As part of a European Union project, EnerGia aligns with EU sustainability goals and regulatory standards, promoting environmentally responsible practices across the continent. The platform aims to drive sustainable growth while ensuring compliance with European regulations on carbon emissions and climate action.

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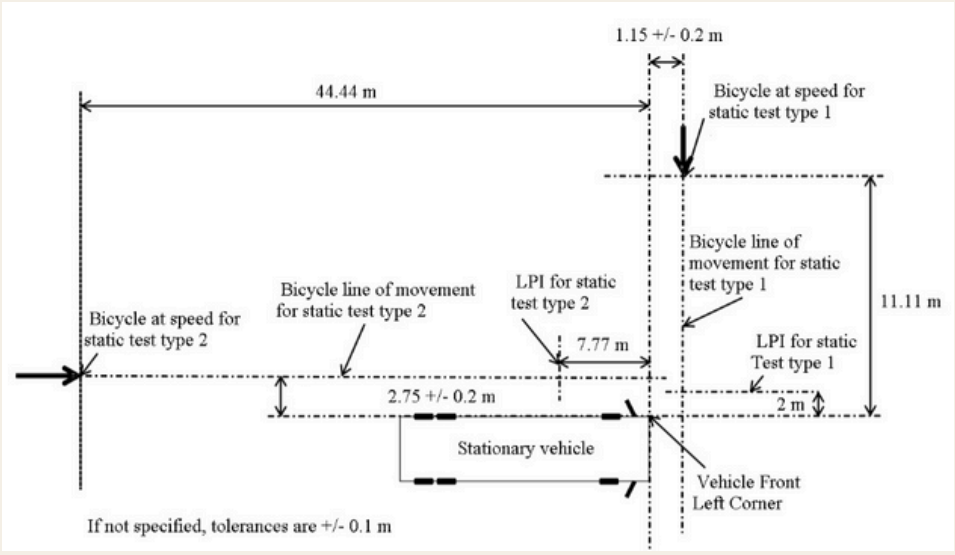
L'ORA : AI-Powered Personalized Beauty

What?

- As part of the Innovolt Ford Otosan case study, we conducted a comprehensive analysis of the Blind Spot Information System (BLIS) to evaluate its compliance with established automotive industry standards. The primary objective was to assess the system's efficacy in detecting dynamic and static objects, such as bicycles and stationary vehicles, within predefined distances. Utilizing the provided dimensional data, we performed precise calculations to validate the system's accuracy and alignment with stringent safety protocols. The analysis specifically focused on static test types 1 and 2, measuring critical distances, including 11.11 m, 44.44 m, and 2.75 m, with tolerances maintained at +/- 0.1 m unless otherwise specified. This rigorous evaluation aimed to ensure the system's reliability in real-world scenarios.



$$d_{b,3} = R \cdot \cos^{-1}\left(\frac{R-Y}{R}\right) - \sqrt{R^2-(R-Y)^2}$$

$$d_b = 8s \cdot v_{\text{Vehicle}} - L - R\ \cos^{-1}\left(\frac{R-Y}{R}\right) + \sqrt{R^2-(R-Y)^2}$$

Result

The analytical results confirmed that the BLIS system adheres to the required standards for blind spot detection. For static test type 1, the system demonstrated accurate detection of a bicycle moving at speed at a distance of 11.11 m, with the Lateral Position Indicator (LPI) positioned at 2.75 m +/- 0.2 m. In static test type 2, the system effectively identified a bicycle at a distance of 44.44 m, with the LPI at 1.15 m +/- 0.2 m. Additionally, the system successfully detected a stationary vehicle at 2.75 m, ensuring comprehensive coverage of blind spots. These findings underscore the system's robustness and its ability to meet safety regulations, thereby significantly enhancing vehicle safety and mitigating the risk of collisions. This analysis highlights Ford Otosan's dedication to advancing automotive safety through innovative technological solutions.

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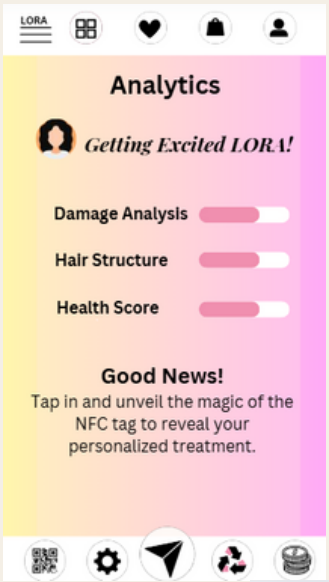
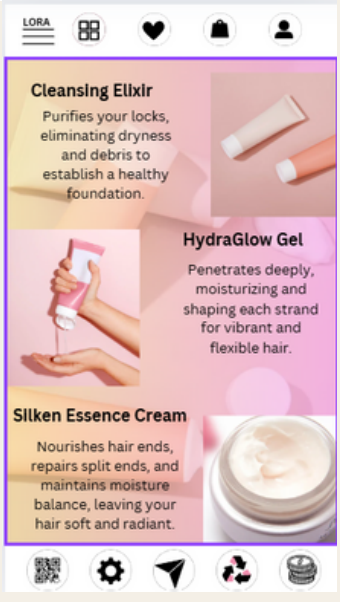
L'ORA : AI-Powered Personalized Beauty

What?

- L'ORA is an AI-based personal assistant mobile application designed to revolutionize the future of professional beauty through technology. By leveraging artificial intelligence, L'ORA analyzes users' hair and skin types with a simple scan, offering personalized product recommendations from L'Oréal Paris. The app also features a barcode scanning system that evaluates existing products, suggesting alternatives to optimize usage and reduce waste. Additionally, L'ORA promotes recycling by allowing users to recycle used products, earn points, and redeem them for rewards like virtual party tickets. With features like geographical analysis and ethnicity-based customization, L'ORA provides a holistic, inclusive, and sustainable beauty experience.





Result

L'ORA transforms the beauty industry by combining personalization, sustainability, and technology. By reducing unnecessary product consumption and promoting recycling, the app minimizes environmental impact while helping users make informed choices. The AI-driven recommendations ensure that users receive tailored solutions, enhancing their beauty routines and reducing product waste. The recycling rewards system incentivizes eco-friendly behavior, turning used products into points for immersive virtual experiences. L'ORA not only elevates the user experience but also aligns with global sustainability goals, making beauty more purposeful, inclusive, and environmentally conscious.

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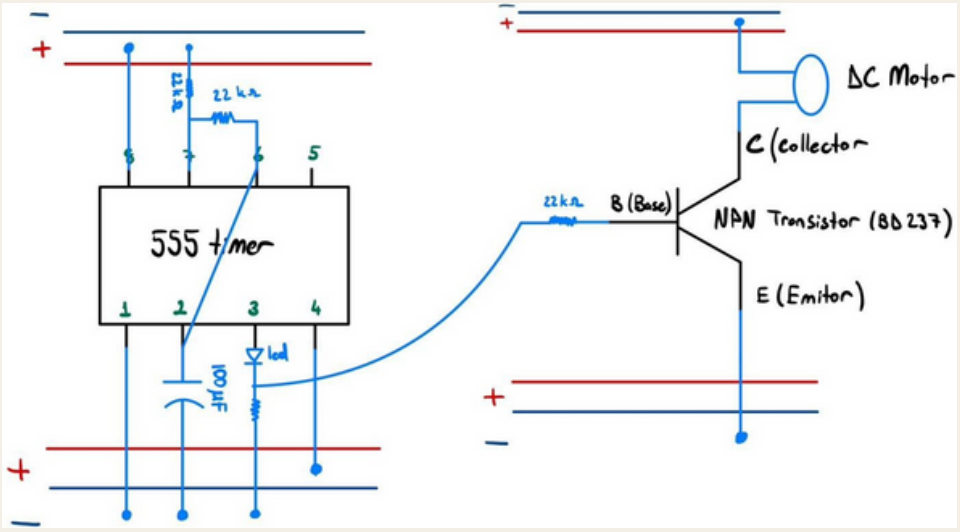
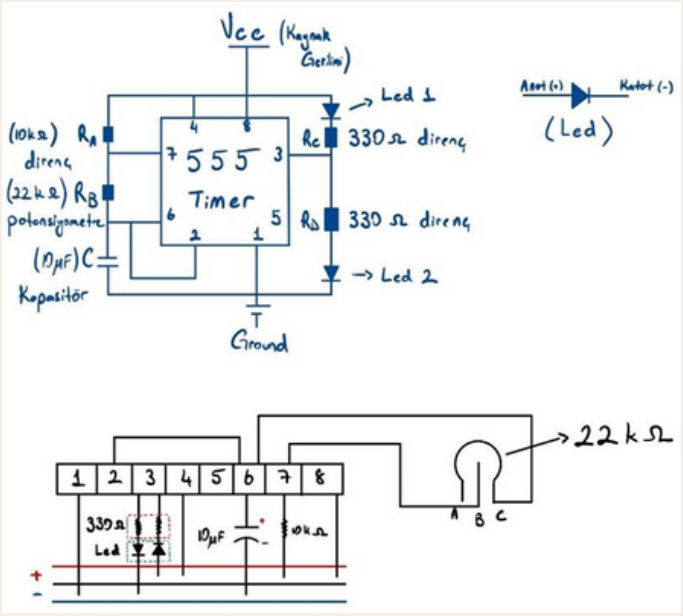
BlinkMaster: Exploring NE555 Timer for LED Flasher Circuits

What?

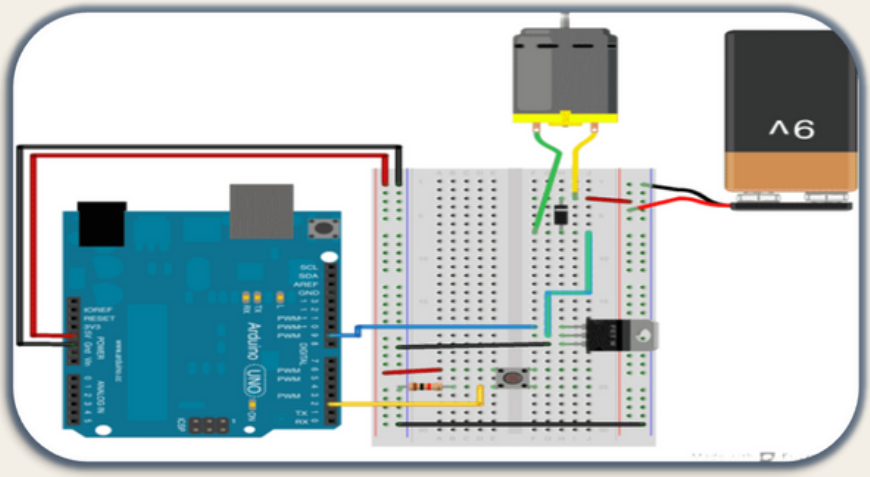
- This project focuses on designing and implementing LED flasher circuits using the NE555 timer IC. It aims to explore timing integration, flickering rate control, and the NE555's functionality as a versatile integrated circuit. Students gain practical experience in assembling circuits and applying fundamental electronics principles within a laboratory setting.

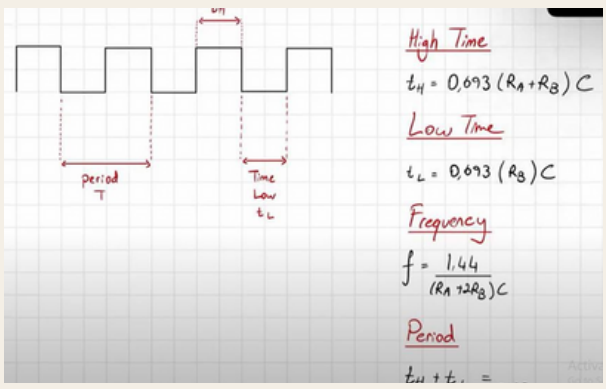




Result

The NE555 timer IC is utilized to construct and analyze LED flasher and DC motor control circuits. By leveraging its trigger and output pins, the IC controls the flickering rate of LEDs and adjusts motor run and stop times. The project emphasizes practical circuit design, demonstrating the NE555's capacity for timing-based applications and its role in integrating electronic components effectively.The project, BlinkMaster, provided participants with hands-on experience in electronic circuit design, focusing on timing integration and component connectivity. The NE555's timing capabilities were successfully applied to manage LED flickering and motor operations, fostering a deeper understanding of circuit functionality and design in real-world applications.





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ATVCFEPK - SentSecPro
Corporate-Vulnerability-Management-System

What?

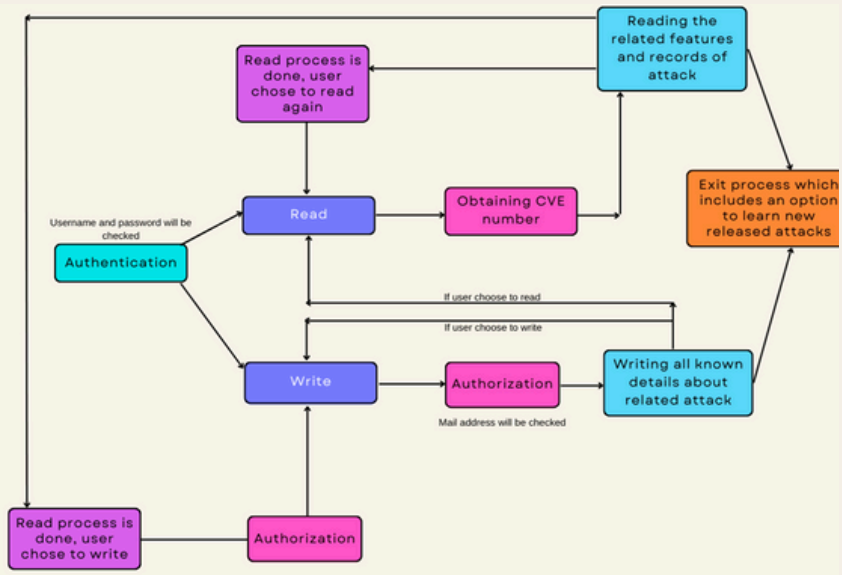
- The corporate powerlessness **database framework** oversees manages past vulnerabilities and attacks, accessible only to authorized personnel. It provides detailed information, including descriptions, modification history, solutions, tools, affected software configurations, and threat detection, retrievable via CVE numbers. It also offers insights into newly released threats.

```
Please, enter username and password: selin
admin123
Please, enter username and password: melek
dictAttackIsPerfect
Please, enter username and password: Nurdan/Sar
Kmshd56-=

Please enter the preference (read/write/exit):
```

```
Please, enter username and password: Selin
admin123
Please, enter username and password: Melek
password123
Please, enter username and password: Sena
mypassword


...Program finished with exit code 0
Press ENTER to exit console.
```



Result

The Corporate Vulnerability Database Framework manages vulnerabilities and cyber-attacks, accessible only with a secret word and username. It provides point-to-point data, including CVE-based insights, descriptions, modification history, solutions, and detection methods, while enabling access to newly disclosed threats.

With secure authentication and detailed data retrieval, the system ensures robust database interactions. Future improvements like credential recovery and user activity tracking could enhance functionality and security.

```
lease, enter username and password: Serdar/Ars
*9zXyzm-

lease enter the preference (read/write/exit):
```

```
Please, enter username and password: Serdar/Ars
FB@1907

Please enter the preference (read/write/exit): exit

Would you like to be informed about new released attacks?yes
You chose to read beyond about new released attacks and methods.
Please visit the website via provided URL: https://attack.mitre.org/resources/updat

You chose to exit, program is terminated.

...Program finished with exit code 0
```