Department of Electronics, Telecommunications and Informatics

Relatório

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Introduction

Our web application, developed using the Django framework, is designed specifically for managing fish cages and the data collected from them. With this application, operators are able to input and edit information about each cage on a monthly basis, including details about the number and type of fish present, as well as any other relevant data.

In addition to inputting and editing this information, the application also has the ability to calculate theoretical results based on the inputted data. This feature is designed to aid operators in understanding and analyzing the data they have collected.

The application also provides statistical overviews of the data inputted, allowing operators to view trends and patterns in their data. This can be a useful tool in identifying any issues or areas for improvement within the fish cages.

Overall, our goal with this project was to create a user-friendly and efficient tool for operators to track and analyze their fish cage data. We believe that this application will greatly benefit operators in their daily operations and help them make informed decisions about their fish cages.

Objectives

The main objective of this project was to create a web application that would allow for the efficient management and analysis of fish cage data. This included the ability to create and delete cages, as well as input and edit information about each cage on a monthly basis. Specifically, operators were able to add a line of month stats with details such as the number and weight of fish, as well as information about the actual feeding provided.

Another key objective of this project was to present a range of statistics based on the data inputted. This included statistics about the number of feedings made during each month for all cages, as well as statistics about the size of the fish during each month. Additionally, the application was designed to present statistics about the number of fish that had a certain weight by month.

Overall, the objectives of this project were focused on providing operators with a user-friendly and efficient tool for tracking and analyzing their fish cage data. By inputting and analyzing this information, operators can make informed decisions about their fish cages and identify any issues or areas for improvement.

Architecture

The base architecture of this project is built using the Django framework and utilizes a variety of technologies to provide a user-friendly and efficient platform for managing fish cage data.

At the core of the project is the Django application, which is responsible for handling the logic and functionality of the web application. This includes handling requests from the user, interacting with the database to retrieve and store data, and rendering the HTML pages that are displayed to the user.

HTML is used to render the pages of the application, allowing for the display of content and user interface elements to the user. Java Script is also utilized in the project to provide real-time calculations of values as the user inputs data. This helps to aid the user in the process of introducing data and can improve the accuracy and efficiency of data entry.

The project utilizes a SQLite3 database to store the data being introduced by the user. This includes information about the fish cages, such as the number and type of fish present, as well as details about the monthly data collected. The database is accessed by the Django application as needed to retrieve and store data, allowing for the efficient management and analysis of the data.

Overall, the architecture of this project is designed to provide a user-friendly and efficient platform for managing fish cage data, utilizing Django, HTML, Java Script, and SQLite3 to achieve this goal.
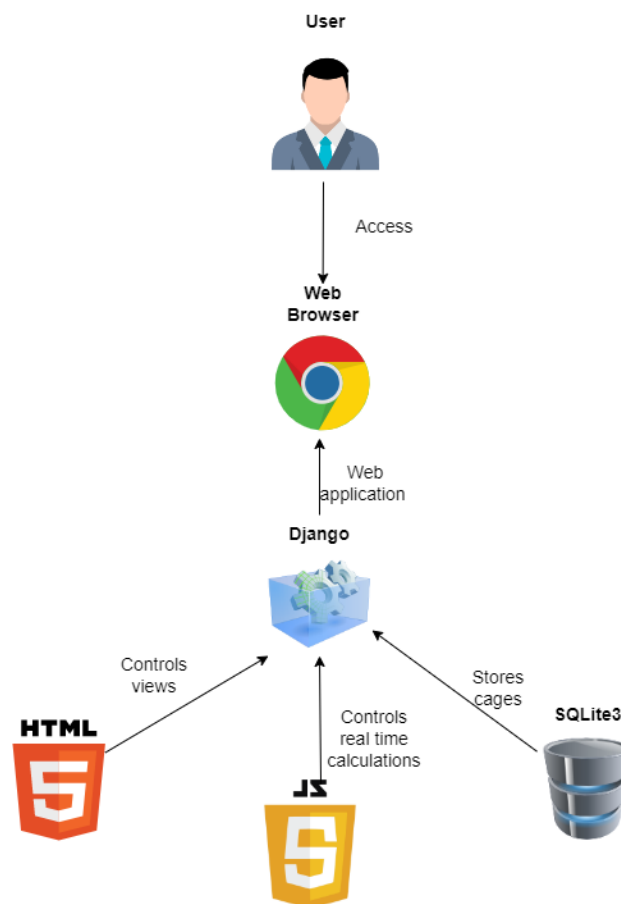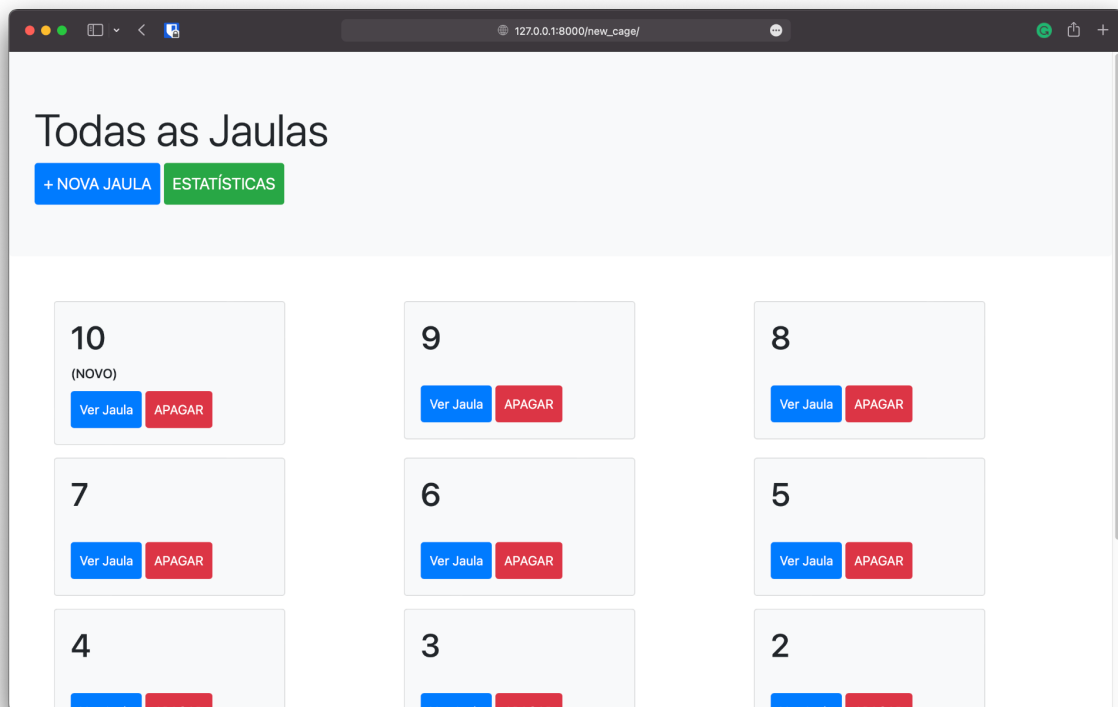

Fig. 1 - Architecture Diagram

Implementation

The initial page of the application displays a list of all cages, along with the option to create a new cage, edit an existing cage, or delete a cage. When the user clicks on the "Create Cage" button, the application creates a new cage with a sequential numbering pattern and the new page is displayed within the main page.

The user can also click on an existing cage to view the details for each month. This page displays a table with the month, number of fish, weight of fish for each month that has been inputted along with much more information recovered for each month. The user has the option to edit or delete a specific month by clicking the corresponding buttons. There is also an option for adding new month data to the cage. The user inputs the details for the month, including the number, weight of fish and any other relevant information. Once the form is submitted, the new month is added to the cage and is displayed on the cage's table.

There is also a page dedicated to displaying statistics for all cages and all months. This page shows a compilation of metrics such as the average number of feedings per month, the average size of the fish, and the number of fish within a certain weight range. These statistics are calculated based on the data inputted by the user and can be a useful tool in understanding and analyzing the data.
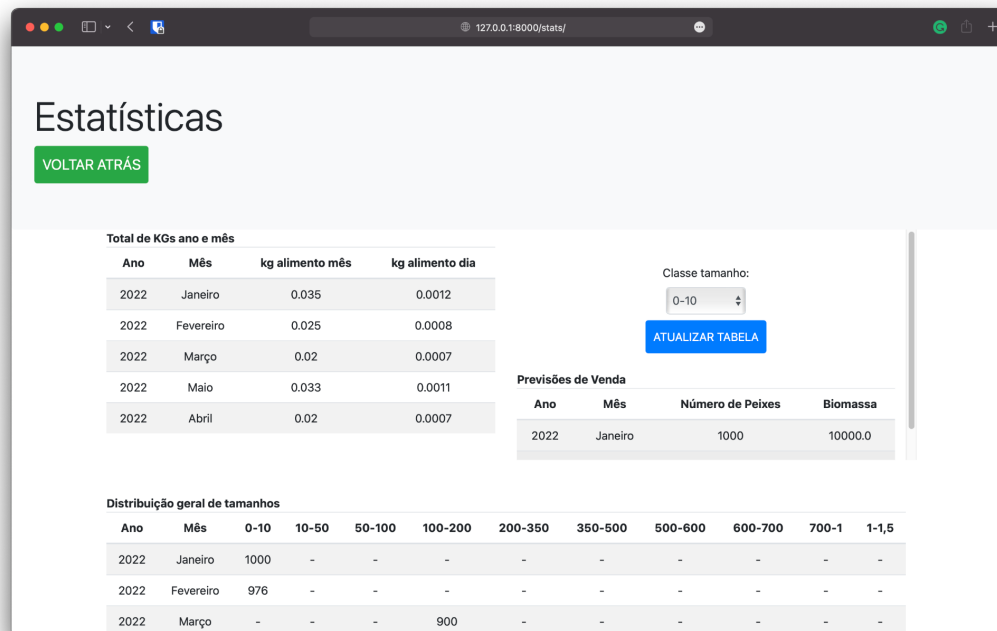
Overall, these pages provide a range of functionality for managing and analyzing fish cage data, allowing the user to input, edit, and view data as needed.

How to run

The project zip file can be obtained either via the eLearning submission, or here in Github. After unzipping the project, simply click with the right button of the mouse in the file named start.ps1 and click on the "Run with PowerShell" option, this will run the project and open the browser interface. The script also verifies if python and the dependencies are installed, if they aren't the script installs all the necessary components.

Future Work

There are several areas of potential future work for this project. One possibility is to continue developing and expanding the range of statistics that are available for analysis. This could include adding new metrics or refining existing ones to provide a more comprehensive understanding of the data.

Another potential avenue for future work is to deploy the application on a cloud platform, which would allow for easier access and scalability. This could involve integrating with a cloud provider such as Amazon Web Services or Google Cloud Platform.

User authentication and access control could also be an area of focus in future work. This could involve implementing features such as login and password protection to ensure that only authorized users are able to access and modify the data.

Integration with a testing pipeline could also be a useful addition to the project. This could involve implementing automated testing to ensure that the application is functioning correctly and identify any issues that need to be addressed.

Finally, further integration with machine learning models could be a potential avenue for future work. This could involve using machine learning algorithms to analyze and interpret the data in more sophisticated ways, potentially making the process more efficient for the company. Some possible machine learning models to consider could include regression algorithms, decision trees, or neural networks.

Conclusion

In conclusion, the Django-based web application developed in this project provides a user-friendly and efficient tool for managing and analyzing fish cage data. It allows for the input and edit of information on a monthly basis for each cage, as well as the calculation of theoretical results based on the inputted data. The application also provides statistical overviews of the data inputted, allowing operators to view trends and patterns in their data. There are several areas of potential future work for this project, including expanding the range of statistics available for analysis, deploying the application on a cloud platform, implementing user authentication and access control, integrating with a testing pipeline, and further integrating with machine learning models. Overall, this application has the potential to greatly benefit operators in their daily operations and help them make informed decisions about their fish cages.