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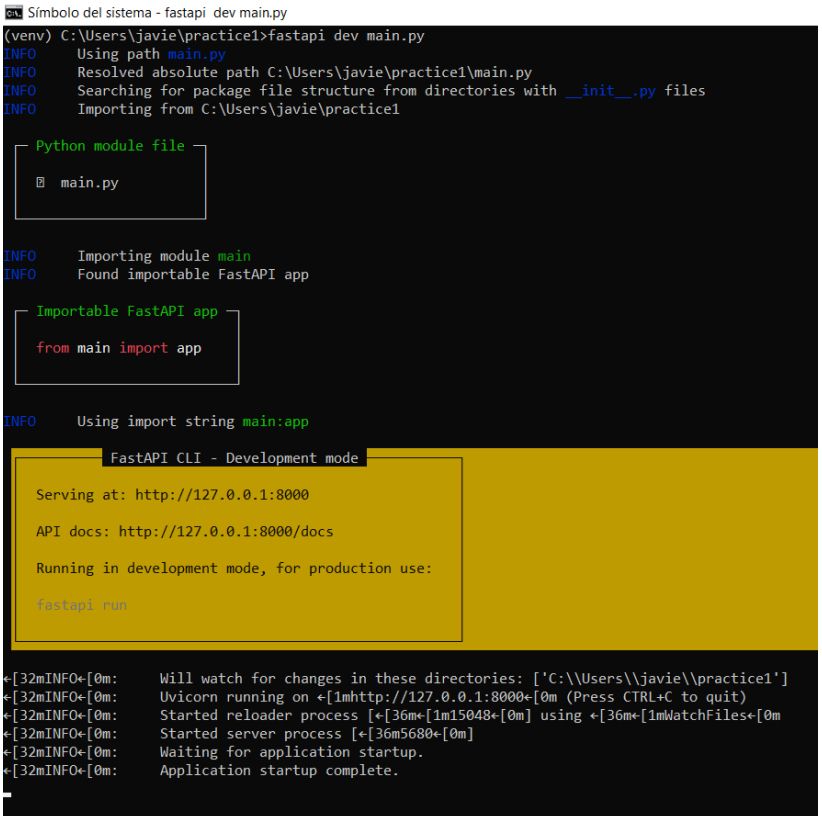
P1: API & Dockerization

Report

Following the steps that FastAPI shows in its web, we have installed all the necessary. After creating the main.py file, we run the server and the following result it's what we get:



As we checked the creation of the API with a browser and random parameters, we can now continue.

We began by restructuring our project to align with the FastAPI framework. Using the FastAPI GitHub repository as a reference, we modified the main.py file to serve as the entry point for our API. This file defines the API structure and serves as the main router for the endpoints.

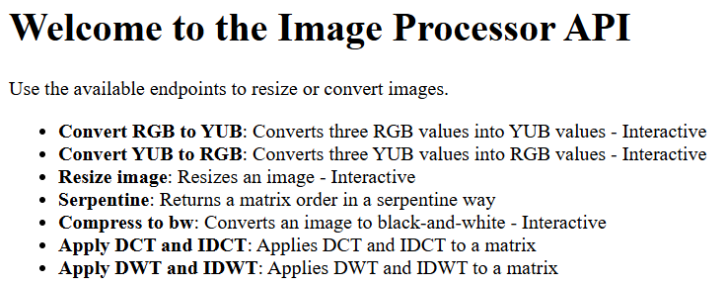
Additionally, we integrated the functionality from Seminar 1 by adapting the S1.py script. With the help of AI, we updated and optimized the previous exercises to fit into the new API framework.

We installed Docker Desktop to enable containerized deployment.

A Dockerfile was created to define the container's setup, specifying the base image, environment, and the steps to build and run the API. Additionally, a requirements.txt file was created to list all necessary libraries and dependencies for the API to function correctly.

Using the tutorial from the FastAPI official documentation, we successfully built the Docker image for the API. After running the container, the API became accessible at http://localhost:80 or http://127.0.0.1:80.

We created six endpoints, leveraging the work from Seminar 1 and extending its functionality. These endpoints were designed to interact with users through both HTML and API-based interfaces. When accessing http://localhost:80 or http://127.0.0.1:80, users are presented with a main menu displayed in HTML format, which provides links to the various API endpoints.

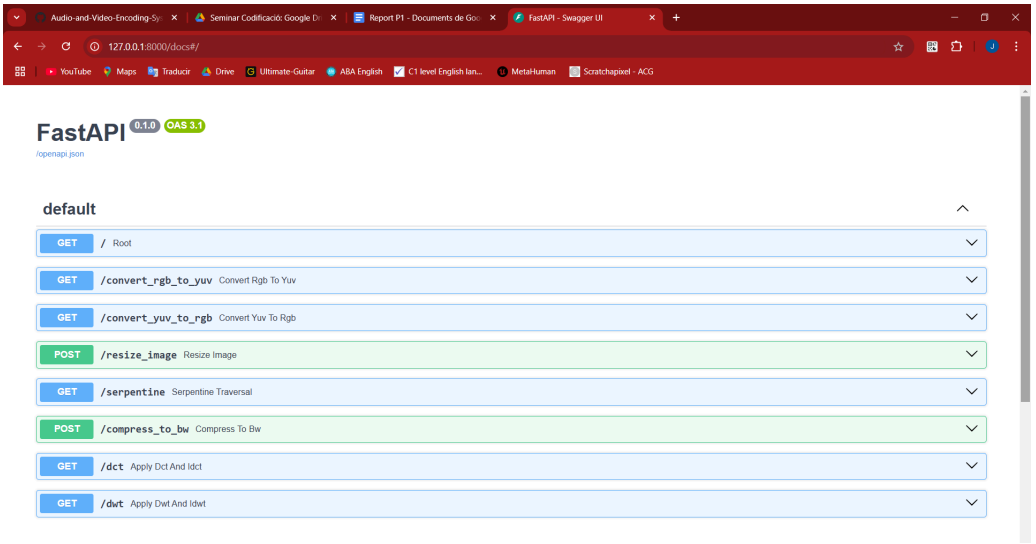


Welcome to the Image Processor API

Use the available endpoints to resize or convert images.

- **Convert RGB to YUB**: Converts three RGB values into YUB values - Interactive
- **Convert YUB to RGB**: Converts three YUB values into RGB values - Interactive
- **Resize image**: Resizes an image - Interactive
- **Serpentine**: Returns a matrix order in a serpentine way
- **Compress to bw**: Converts an image to black-and-white - Interactive
- **Apply DCT and IDCT**: Applies DCT and IDCT to a matrix
- **Apply DWT and IDWT**: Applies DWT and IDWT to a matrix

Additionally, the API documentation is accessible at http://localhost:80/docs or http://127.0.0.1:80/docs through the Swagger UI, allowing users to interact with the API's endpoints in a structured and intuitive way.



Among the six endpoints, four provide interactivity, enabling users to perform specific tasks. These include value conversion, where users can input values for transformation, and image manipulation, which allows users to upload an image for resizing or applying a black-and-white filter. These interactive endpoints highlight the adaptability and enhanced functionality of the integrated work, offering a user-friendly experience for interacting with the API.

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Commands Used for Running the FastAPI and Docker

To run and manage the FastAPI application locally, we used the command *fastapi dev main.py* to start the API in development mode. When finished, the API could be stopped by pressing CTRL + C. These simple commands allowed for efficient testing and debugging during the development process.

For Docker, we ensured the application was containerized and ready for deployment by first building the Docker image with the command *docker build -t myfastapiapp* .. Once built, the container was run using *docker run -d -p 80:80 --name myfastapiapp myfastapiapp*, which started the application on port 80. To stop and remove the container, the command *docker rm -f myfastapiapp* was used. Additionally, if the image was no longer needed, it could be removed using *docker rmi myfastapiapp*, though this step was optional. These commands facilitated seamless container management and ensured a robust deployment pipeline.