

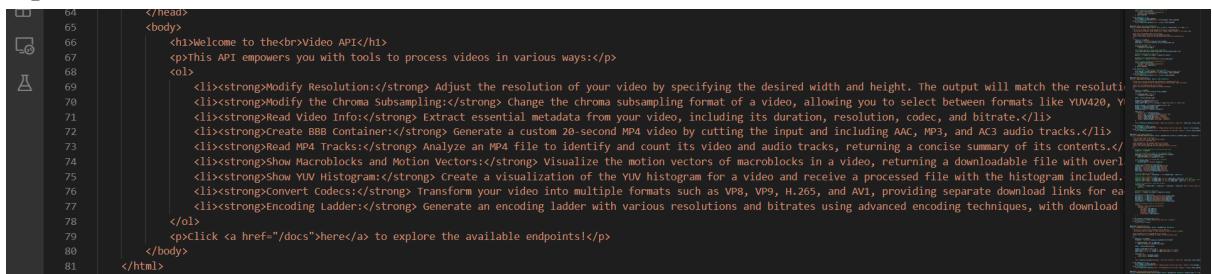
P2: Transcoding and final work

Report

Following the steps, we started by adding a new feature to the API that has the function of converting any input video into VP8, VP9, h265 & AV1. The result of doing this was successful, and the API returns four links to download the video in each of the four formats.

Then, we added the last feature of the API. This one does an encoding ladder to the video. Each ladder level will include versions of the video at different resolutions and bitrates.

After finishing all the endpoints, we created a simple GUI where all the functions and explanations were:



```

64      </head>
65      <body>
66          <h1>Welcome to the<br>Video API</h1>
67          <p>This API empowers you with tools to process videos in various ways:</p>
68          <ol>
69              <li><strong>Modify resolution:</strong> Adjust the resolution of your video by specifying the desired width and height. The output will match the resolution you specified.
70              <li><strong>Modify the Chroma Subsampling:</strong> Change the chroma subsampling format of a video, allowing you to select between formats like YUV420, YUV422, and YUV444.
71              <li><strong>Read Video Info:</strong> Extract essential metadata from your video, including its duration, resolution, codec, and bitrate.
72              <li><strong>Create BBB Container:</strong> Generate a custom 20-second MP4 video by cutting the input and including AAC, MP3, and AC3 audio tracks.
73              <li><strong>Read MP4 Tracks:</strong> Analyze an MP4 file to identify and count its video and audio tracks, returning a concise summary of its contents.
74              <li><strong>Show Macroblocks and Motion Vectors:</strong> Visualize the motion vectors of macroblocks in a video, returning a downloadable file with overlaid motion vectors.
75              <li><strong>Show YUV Histogram:</strong> Create a visualization of the YUV histogram for a video and receive a processed file with the histogram included.
76              <li><strong>Convert Codecs:</strong> Transform your video into multiple formats such as VP8, VP9, H.265, and AV1, providing separate download links for each.
77              <li><strong>Encoding Ladder:</strong> Generate an encoding ladder with various resolutions and bitrates using advanced encoding techniques, with download links for each.
78          </ol>
79          <p>Click <a href="/docs">here</a> to explore the available endpoints!</p>
80      </body>
81  </html>

```

However, in the fourth step it is said that we could improve our code using AI so, we decided to add to our endpoint functions some unit tests and improvements:

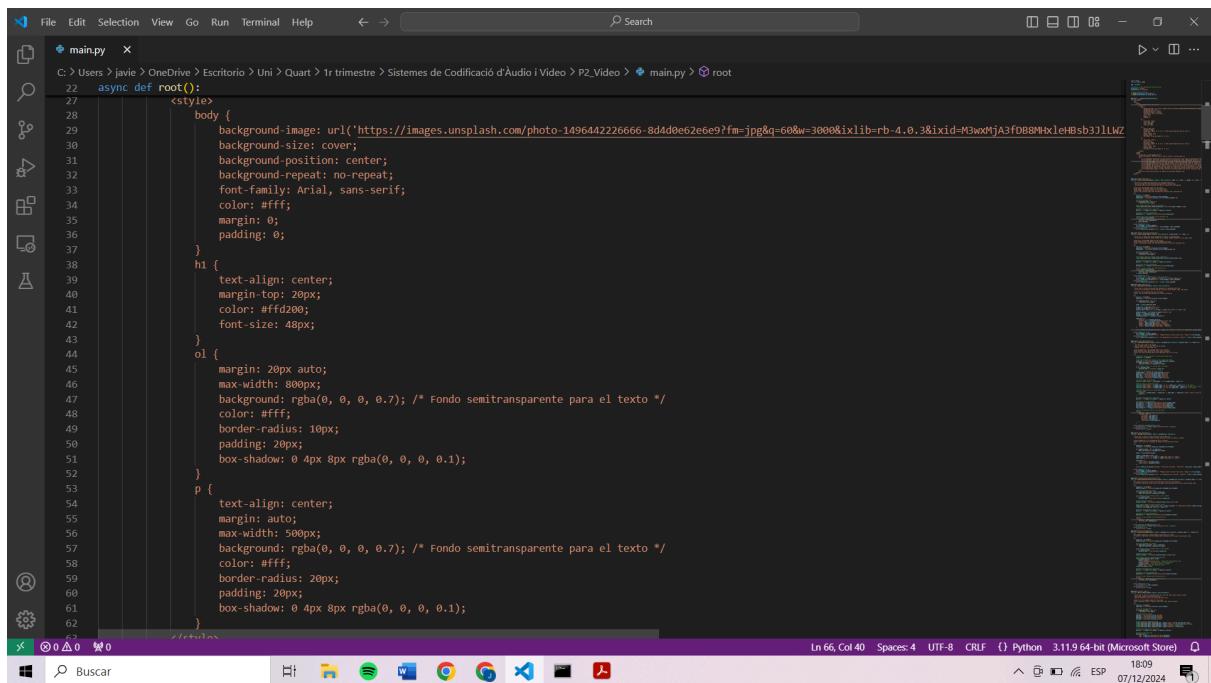
```

try:
    :
    :

except ffmpy.Error as e:
    error_message = e.stderr.decode()
    return JsonResponse(content={"error": error_message}, status_code=400)
except Exception as e:
    return JsonResponse(content={"error": str(e)}, status_code=500)

```

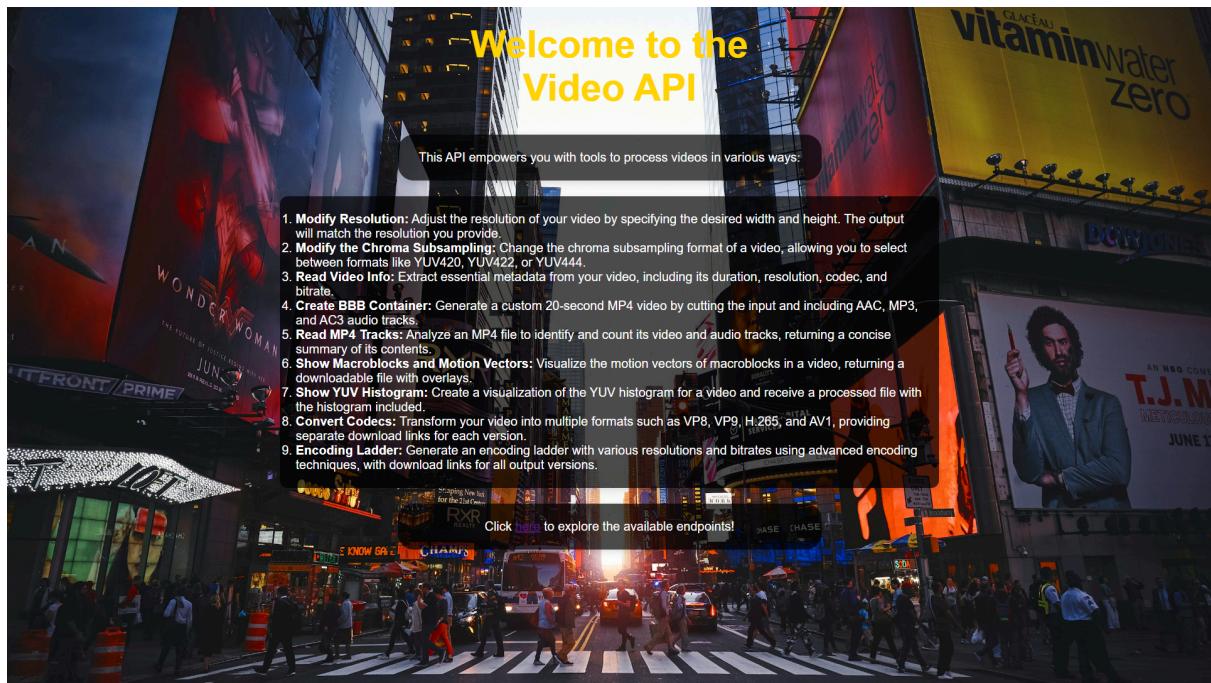
And we also improved the first page of our API not only with the GUI we made but also changing the background to a cool image, the size, the font and the color of the letters, etc. We have enjoyed doing this part because we learned with AI how to do it but we spend time on our own trying and changing the front page.



The screenshot shows a code editor window with a Python file named 'main.py'. The code defines a function 'root' that sets up a static file handler for the root directory. It includes CSS-like styling for the body, h1, ol, and p elements, specifying backgrounds, colors, and fonts. The code editor interface includes a sidebar with icons, a search bar at the top, and various status indicators at the bottom.

```
File Edit Selection View Go Run Terminal Help ← → Search
C: > Users > javie > OneDrive > Escritorio > Uni > Quart > 1r trimestre > Sistemes de Codificació d'Àudio i Video > P2_Video > main.py > root
22     async def root():
23         <style>
24             body {
25                 background-image: url('https://images.unsplash.com/photo-149644222666-8d4d0e62e6e9?fm=jpg&q=60&w=300&ixlib=rb-4.0.3&ixid=M3wxMjA3fDB8MHxleHBsb3JlWz
26                 background-size: cover;
27                 background-position: center;
28                 background-repeat: no-repeat;
29                 font-family: Arial, sans-serif;
30                 color: #fff;
31                 margin: 0;
32                 padding: 0;
33             }
34             h1 {
35                 text-align: center;
36                 margin-top: 20px;
37                 color: #fd0000;
38                 font-size: 48px;
39             }
40             ol {
41                 margin: 20px auto;
42                 max-width: 800px;
43                 background: rgba(0, 0, 0, 0.7); /* Fondo semitransparente para el texto */
44                 color: #fff;
45                 border-radius: 10px;
46                 padding: 20px;
47                 box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
48             }
49             p {
50                 text-align: center;
51                 margin: auto;
52                 max-width: 500px;
53                 background: rgba(0, 0, 0, 0.7); /* Fondo semitransparente para el texto */
54                 color: #fff;
55                 border-radius: 20px;
56                 padding: 20px;
57                 box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
58             }
59         </style>
60     )
61
62
Ln 66, Col 40   Spaces: 4   UTF-8   CR/LF   () Python  3.11.9 64-bit (Microsoft Store)   18:09   07/12/2024
```

This is the final result:



And this is the final API with all the endpoints to modify a video:

FastAPI 0.1.0 OAS 3.1
[/openapi.json](#)

default

Method	Path	Description	▼
GET	/ Root		▼
POST	/Modify Resolution	Convert Resolution	▼
POST	/Modify the Chroma Subsampling	Convert Chroma	▼
POST	/Read video info/	Read Video Info	▼
POST	/create_bbb_container/	Create Bbb Container	▼
POST	/read_mp4_tracks/	Read Mp4 Tracks	▼
POST	/show_macroblocks_motion_vectors/	Show Macroblocks Motion Vectors	▼
POST	/show_yuv_histogram/	Show Yuv Histogram	▼
POST	/Convert Codecs	Convert Codecs	▼
POST	/Encoding Ladder	Encoding Ladder	▼
GET	/Download	Download File	▼