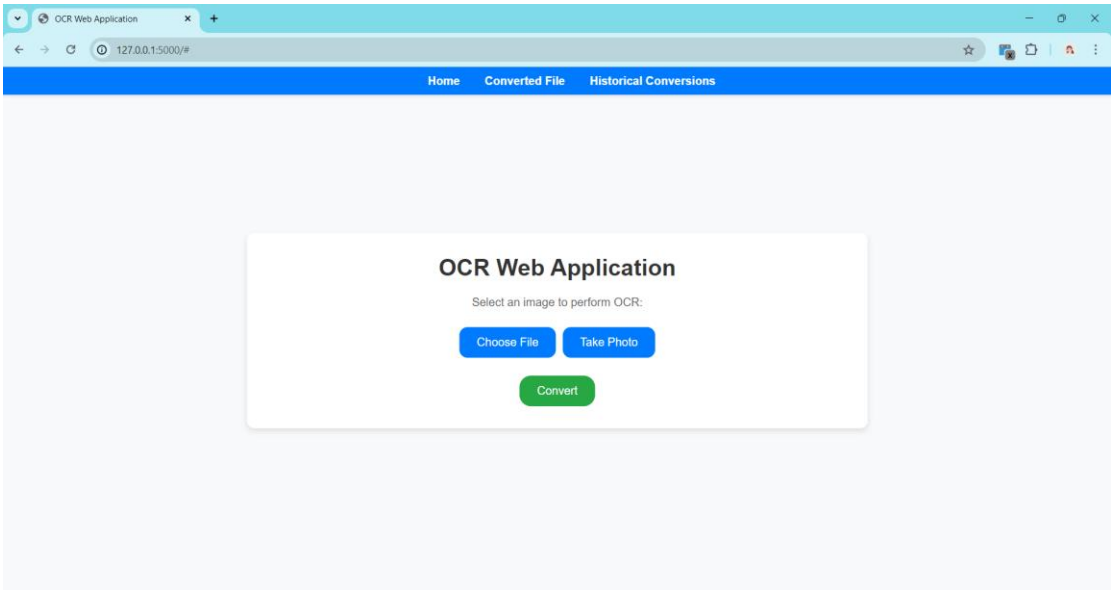
Introduction GUI

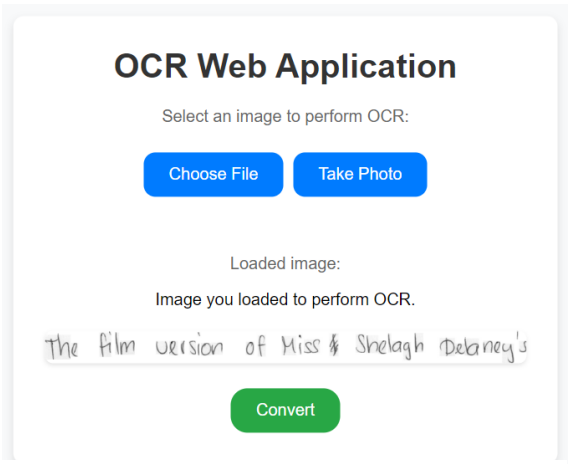
This report details the development of the front-end components of the application, including the HTML structure, CSS styling for responsiveness, and integration with Flask for backend functionality.



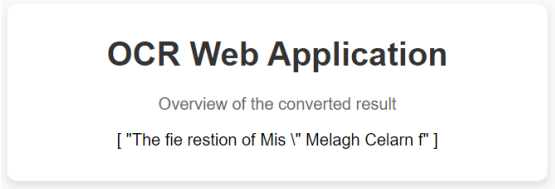
Method

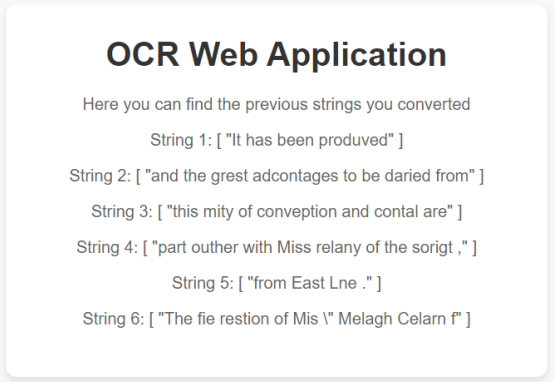
HTML Structure:

1. **Navigation Bar**: We created a fixed navigation bar at the top of the page, which includes links to different sections of the application (*Home, Converted File, Historical Conversions*). This ensures easy navigation for the user.



2. **Containers**: The main content is divided into three containers:
✧ `*home-container*`: This is the default view where users can upload an image or capture a photo using their device's camera.
✧ `*converted-file-container*`: This displays the result after the OCR processing.
✧ `*historical-conversions-container*`: This shows previously converted texts.





CSS Styling:

We employed CSS to enhance the visual appeal and ensure the responsiveness of the web application. Key CSS features include:

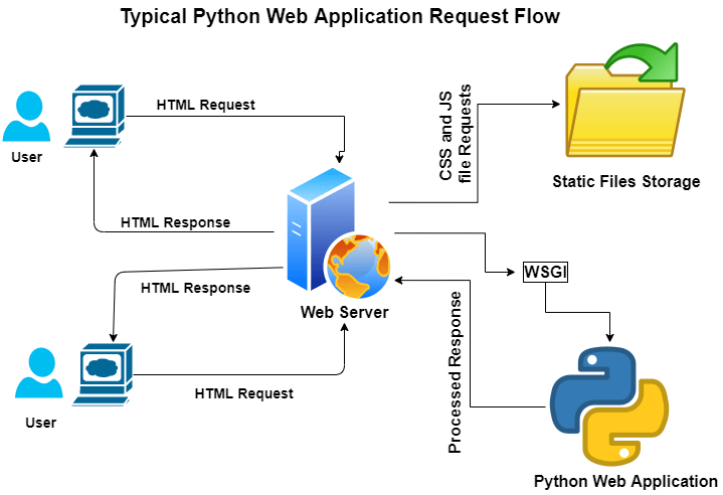
- ✧ *Responsive Design*: Objects of the form are sized according to screen size of the device used.
- ✧ *Button Styling*: Buttons were styled to be visually consistent and included hover effects to improve interactivity.
- ✧ *Mirroring Camera Feed*: When capturing an image using the device's camera, the video feed is mirrored horizontally to make pre-processing feature easier.

JavaScript Functionality:

JavaScript was used to add interactivity to the web page. Key functions include:

- ✧ *Camera Access*: Functions to access the user's camera by creating a video element, capturing images, displaying the captured image, and removing the video element from the DOM[1]. Functions involved: `openCamera()`, `capturePhoto()`, `stopCamera()`
- ✧ *File Upload*: Handles image uploads, including format conversion and image delivery to the server via a POST request. It displays the uploaded image, waits for the server response, and then switches the view to show the converted string results.
  Functions involved: `convertImage()`
- ✧ *Navigation*: Switching between different containers based on user actions.
  Functions involved: `showHome()`, `showConvertedFile`, `showHistoricalConversions`
  `EventListener //Event listener for file input change event`

Integration with Flask[2]

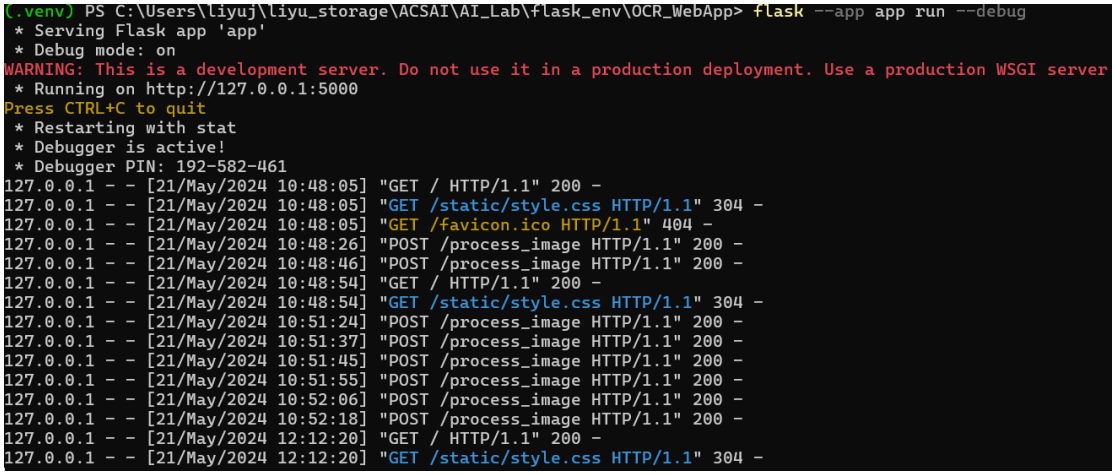


Flask is a WSGI *application*. A WSGI *server* is used to run the application, converting incoming HTTP requests to the standard WSGI environ, and converting outgoing WSGI responses to HTTP responses.

In our project, Flask:

1. Renders the main HTML page: Displays the GUI interface for users.

2. Handles image processing requests: Receives the base64-encoded image data from the client, processes it using the OCR model, and returns the extracted text.
3. Manages different views: Switches between the home view, converted file view, and historical conversions view based on user interactions.



Results

The application allows users to easily upload images or capture photos directly from their devices. The responsive design ensures that the application is accessible on various devices, providing a consistent user experience.

Challenges Encountered

1. Camera Access and Mirroring: Implementing the camera functionality and ensuring the video feed was mirrored correctly required careful handling of video streams and CSS transformations.
2. Responsive Design: Ensuring the layout was fully responsive involved extensive testing and adjustments, particularly for mobile devices with different screen sizes.
3. Integration with Flask: Managing the communication between the front end and the Flask backend required a clear understanding of both client-side and server-side programming.

[1] Document Object Model
[2] https://flask.palletsprojects.com/en/2.3.x/deploying/