# Group 7

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# Project 2 Proposal

## App purpose/description

The purpose of this application is to allow users to explore new hairstyles and hair colors automatically using AI-generated transformations from images retrieved through their social media photo accounts (e.g., Google Photos). Instead of manually uploading images, the user will authorize the app to access their existing photo feed, from which the app will identify photos that contain a clear front-facing image of a person. These images will then be displayed in a scrollable interface where users can click on one to select it for processing.

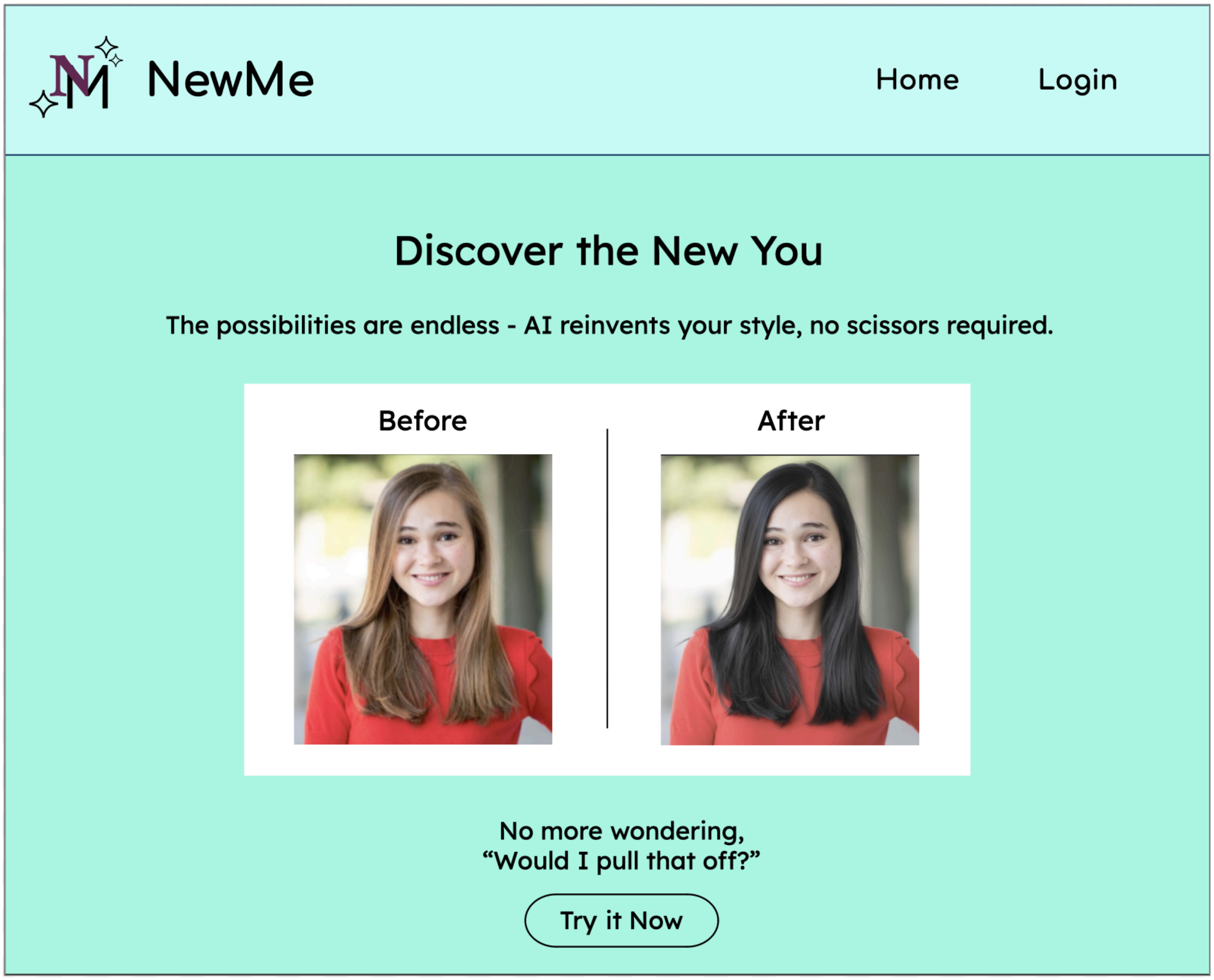
After selecting an image, the system will apply the **Google Vision API** to analyze the image, identifying facial regions, hair color, and hairstyle attributes. The processed results will then be sent to the **Google Gemini API**, which will generate a hairstyle description.

The application will display the selected image along with an AI-generated hairstyle description and allow users to experiment by entering new customization requests for hair color and hairstyle, such as the default suggestions “Red” or “Mohawk.” These requests will be processed through the **Google Gemini API**, which generates an updated image reflecting the user’s chosen changes. Users can then visualize the new look and either apply additional modifications or select a different image to style.

The app aims to provide a fun, interactive, and creativity-driven experience for users who want to experiment with their appearance virtually—without the need for manual editing or real-world commitment. The project integrates **social media authentication**, **Google Vision** for image analysis, and **Gemini** for generative styling suggestions, creating a seamless AI-powered virtual styling platform.

MockUp interfaces - Vanessa

Homepage:

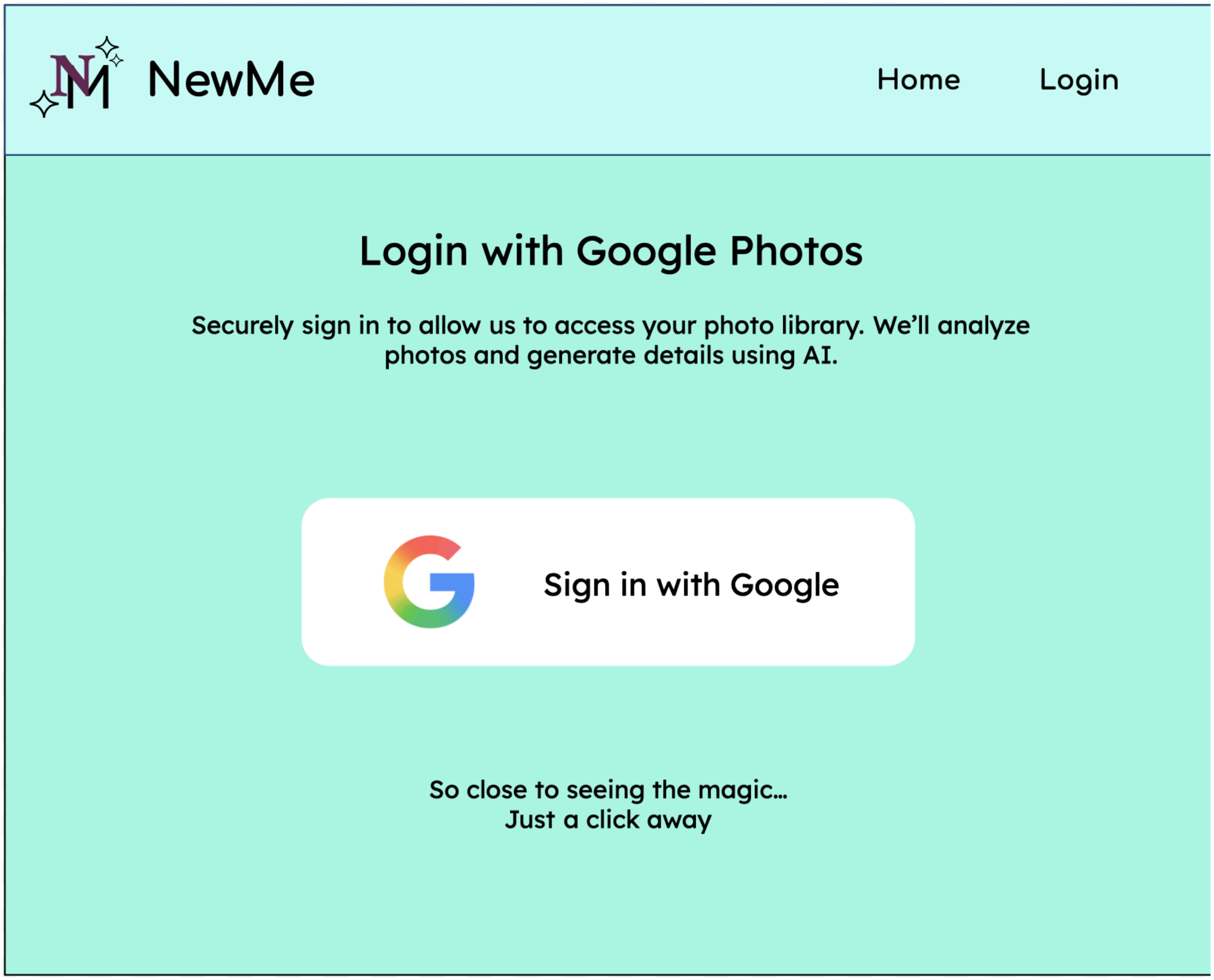


Discover the New You

The possibilities are endless - AI reinvents your style, no scissors required.

No more wondering,
“Would I pull that off?”

If user selects “Try it Now” or “Login”:

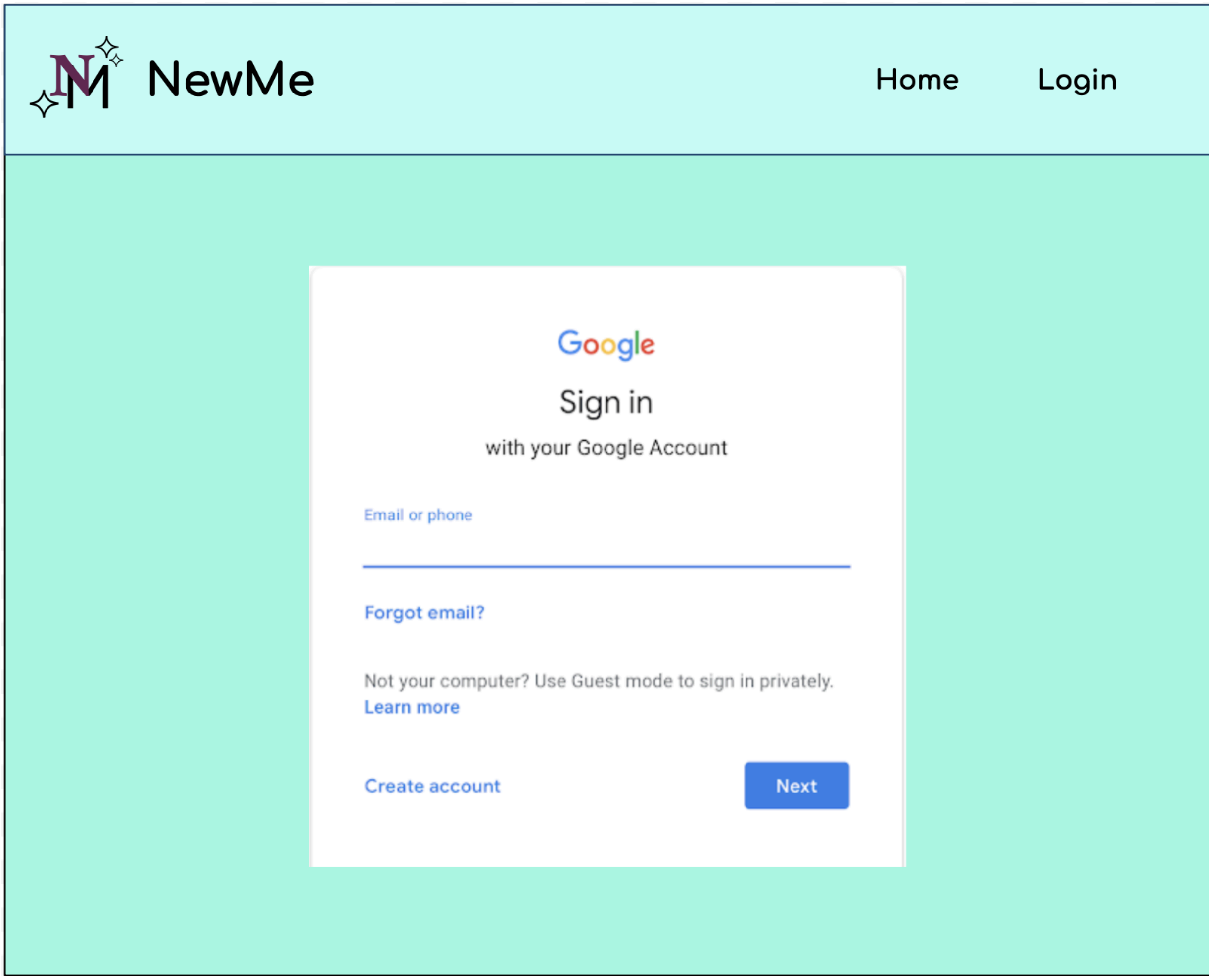


## Login with Google Photos

Securely sign in to allow us to access your photo library. We’ll analyze photos and generate details using AI.

So close to seeing the magic…
Just a click away

After pressing the Google sign in button:



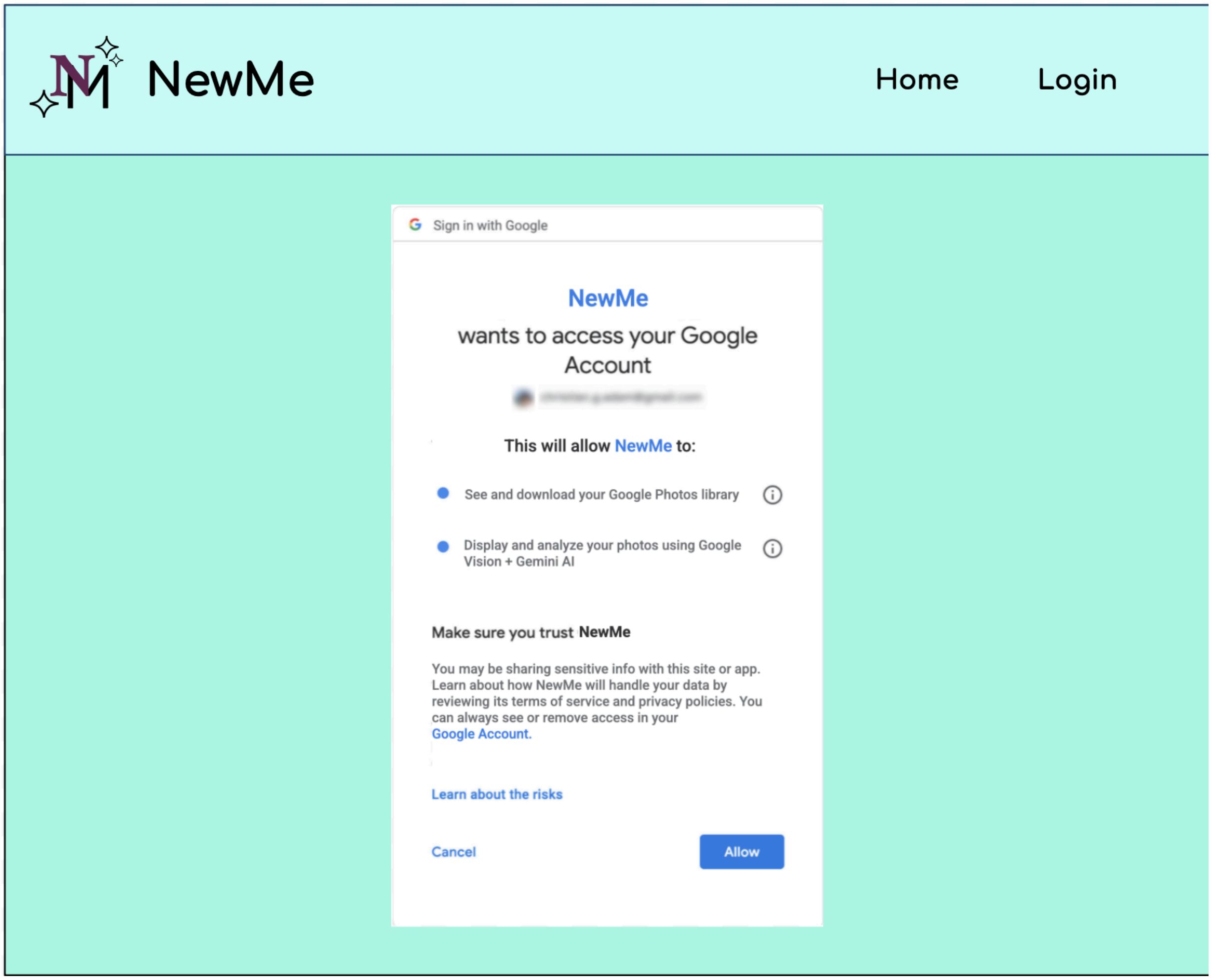
Sign in

with your Google Account

Email or phone

Not your computer? Use Guest mode to sign in privately.

After pressing “Next” and entering password:



Sign in with Google

NewMe

wants to access your Google Account

[redacted]

This will allow NewMe to:

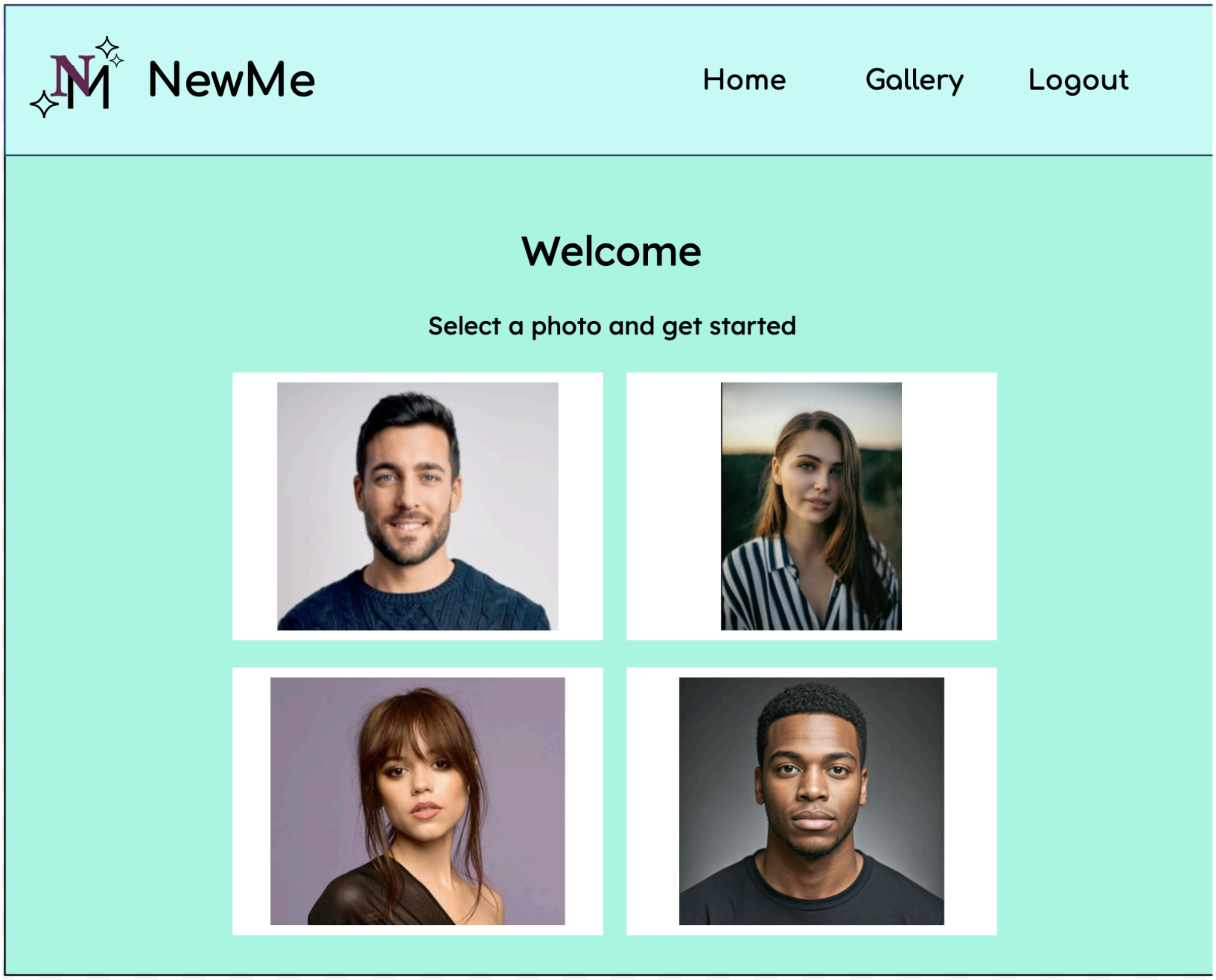
- See and download your Google Photos library
- Display and analyze your photos using Google Vision + Gemini AI

Make sure you trust NewMe

You may be sharing sensitive info with this site or app. Learn about how NewMe will handle your data by reviewing its terms of service and privacy policies. You can always see or remove access in your Google Account.

Learn about the risks

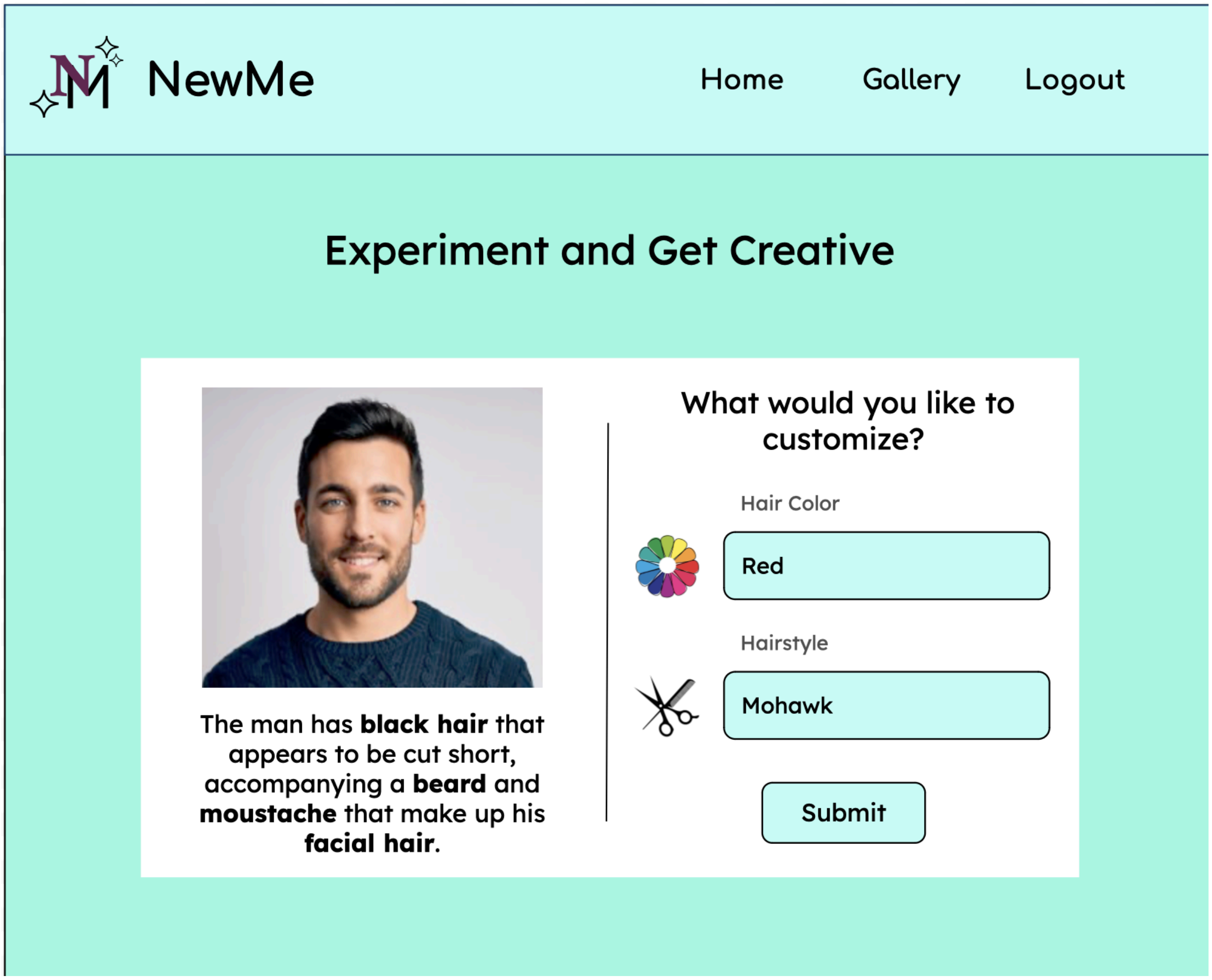
After selecting "Allow":



Welcome

Select a photo and get started

After selecting the top left image:



Experiment and Get Creative

The man has **black hair** that appears to be cut short, accompanying a **beard** and **moustache** that make up his **facial hair**.

What would you like to customize?

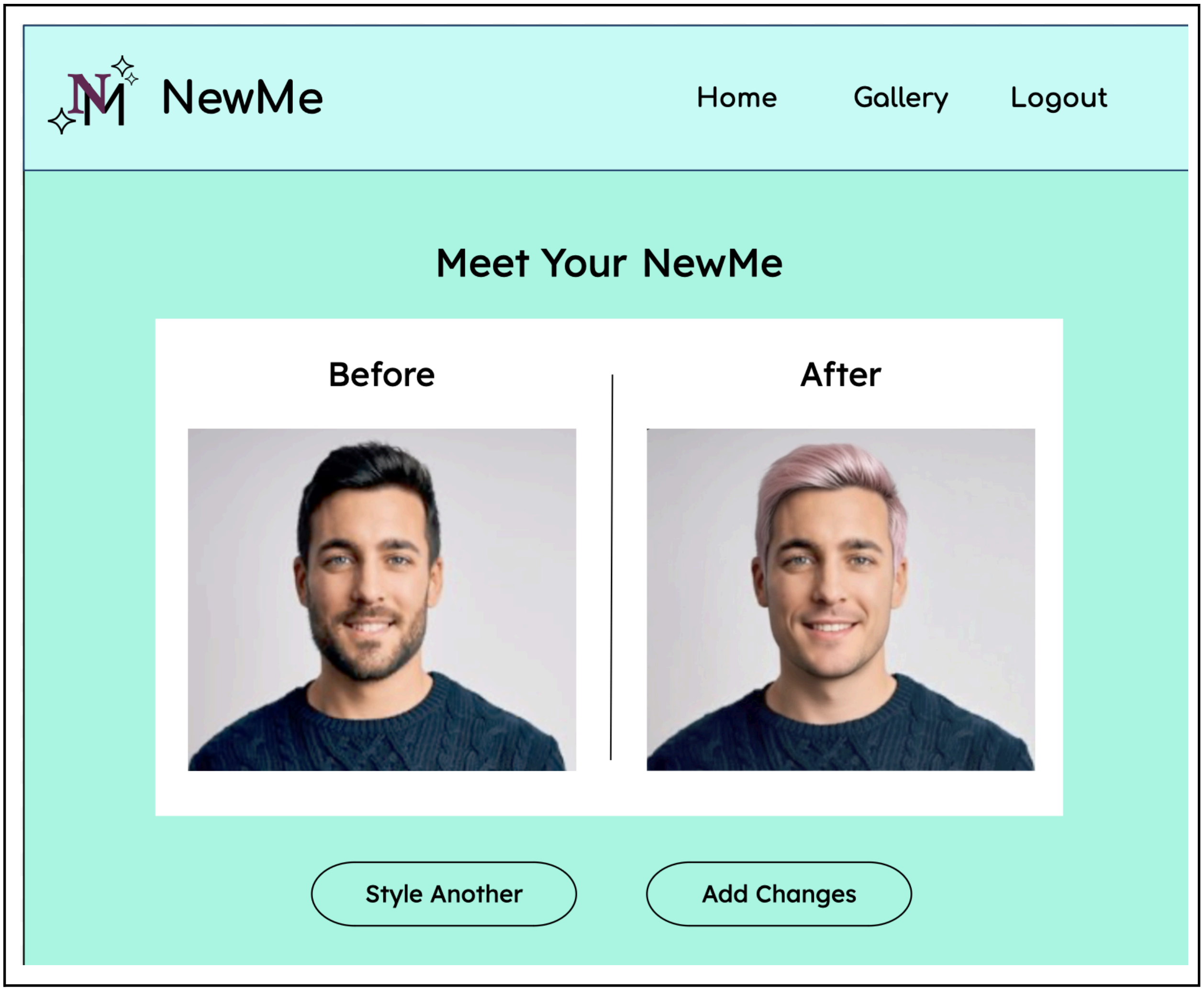
Hair Color

Red

Hairstyle

Mohawk

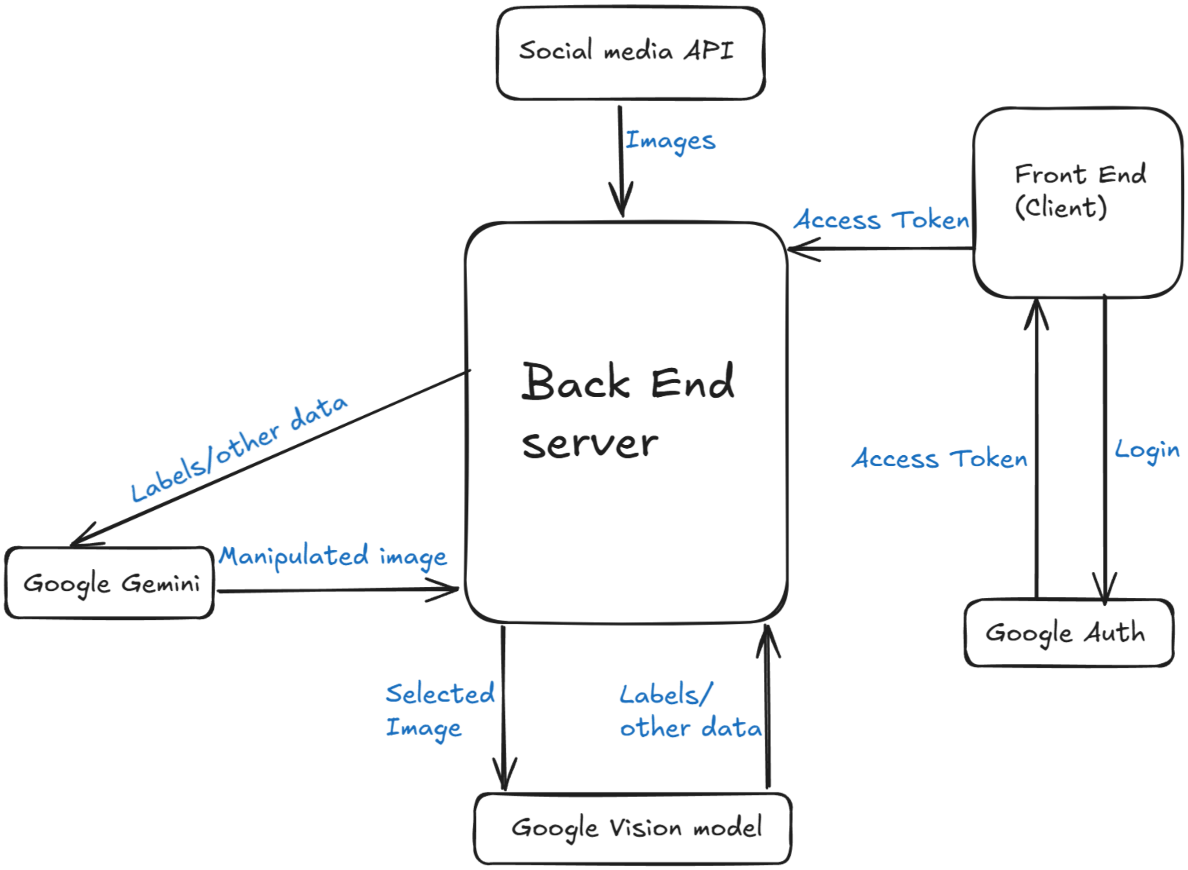
After entering “Pink” for the hair color and “No beard” for the hairstyle and -> Submit



Meet Your NewMe

## System Diagram

*NOTE - May change as we progress.*



# Flow of Control Details (steps in processing w/technical details - what you are doing/using)

*NOTE - May change as we progress.*

## Step 1 - User Login And Authorization

1. The user opens the **NewMe** web application in the browser.
2. The user clicks on "**Sign in with Google.**"
3. The front end triggers a **Google OAuth 2.0** authorization procedure.
    a. A request is made to access the **Google Photos Library API**.
4. Authorization code is returned to the frontend.
5. Frontend passes the authorization code to the backend server.
6. The backend exchanges the authorization code for an access token to retrieve the user's photo library.

Technical details -

- Authentication is handled using **Google OAuth 2.0**.
- The backend is implemented in **Node.js / Express**.
- The frontend is developed using **React.js**.

## Step 2 - Retrieving and Filtering User Photos

1. Backend uses access token to call **Google Photos REST API**.
2. The application filters and retrieves images that contain **clear, front-facing human faces** using **Google Vision API**.
3. The filtered photos are displayed in a **scrollable gallery view** for the user to select an image for processing.

Technical details -

- Google Vision API is used to detect human faces and identify facial features (e.g., hair, eyes, face boundaries).
- Only images meeting a confidence threshold (e.g., 90% face detection accuracy) are displayed.
- The React frontend dynamically renders a gallery grid layout.

## Step 3 - AI Hairstyle Analysis and Transformation

1. The user selects an image from the gallery.
2. The selected image is analyzed by the **Google Vision API** to identify the current hairstyle and hair color.
3. The user can enter a **customization request** (e.g., “Red” or “Mohawk”).
4. The backend sends the image data and user request to the **Google Gemini API**.
5. Gemini generates a **new hairstyle description** and a **transformed image** reflecting the requested change.
6. The frontend displays the updated image and AI-generated description.
7. The user can choose to **apply additional changes** or **select a new image**.

Technical details -

- Gemini Vision + Language model used for generating visual transformations and natural language hairstyle descriptions.
- Responses are formatted and returned as structured JSON data.
- Backend stores the original and processed image metadata in **Google Firestore**.

Other Technical details -

The front end web app will dynamically create a grid/gallery view where photos are displayed for the user to select.