

# Hackathon Task: Face Recognition Platform with Real-Time AI Q&A using RAG

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## Objective

Build a browser-based platform that enables users to register their faces and recognize them in real-time using laptop camera streams. The platform should support facial recognition, multi-face detection and include a chat interface powered by RAG to answer queries related to face registration activities.

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## Core Functional Modules to Build

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### 1. Registration Tab (React Frontend + Python Face Recognition + Database)

- Access laptop webcam or external camera for video feed.
  - Detect and capture face images using your preferred face recognition libraries
  - Assign a name to the detected face.
  - Store the facial encoding and metadata (name, registration timestamp) in a database(select database of your preference)
  - Allow multiple unique face registrations.
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### 2. Live Recognition Tab

- Stream webcam feed.
  - Continuously scan for known faces using the stored encodings.
  - Overlay bounding boxes and names for each recognized face in real-time.
  - Handle multiple face recognition simultaneously in one frame.
  - Addition info: Feel free to process just one or two images frames in a second if your laptop cannot handle it
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### 3. Chat-Based Query Interface (React + Node.js + Python RAG)

- Chat widget embedded in the frontend
  - Communication happens via **WebSockets**:
    - React ↔ Node.js ↔ Python RAG engine.
  - RAG engine should use vector similarity and an LLM API (OpenAI ChatGPT) to answer queries like:
    - *"Who was the last person registered?"*
    - *"At what time was Karthik registered?"*
    - *"How many people are currently registered?"*
  - Preferred tech stack for RAG implementation will be (LangChain + FAISS + LLM)
  - Use your own OpenAI ChatGPT API tokens during this task, you will be given different tokens during evaluation
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#### Mandatory TechStack

Module	Tech
Frontend	React.js
Backend	Node.js (API, WebSocket Server)
Face Recognition	Python
RAG	Python
Database	Any
LLM	OpenAI's ChatGPT

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#### Evaluation Instructions

As we have candidates who are interested in AI and full stack together, we have created a problem statement which combines focus on all of this.

Give your best shot in your area of preference. For example, if you have AI as your primary area of interest, focus more of your work and creativity in Face recognition and RAG implementation and if your primary area of interest is Full stack, focus more on the full stack implementation like having a creative user interface, exposing innovative APIs and implementing high-performing websocket.

In your submission, you must

- Create a public repository in github and add a README.md file to follow the instructions and do the setup
- Add a line "This project is a part of a hackathon run by <https://katomaran.com> " in your README.md file's bottom
- Assume anything you want which is not explicitly mentioned in the document and mention your assumption in the README.md
- Attach an architecture diagram of your app along with your submission
- Add a loom video(or similar) link in the README.md file where you explain and demonstrate your working app
- Implement organized logging so we can review log for event tracking
- Submit your github repository in the google form before **12 PM on Saturday, 31st May, 2025.**

Additional Instructions

- Your code must be structured, modular, scalable and well-named
- Good looking user interfaces will be valued very highly
- You will be asked to run the code and explain the application in your final round of interview
- Although we would recommend everyone to follow the instructions above, you may decide to ignore a few for an innovative reason, but you must ensure your submission is good so you get a chance in the next round to explain it to us.
- For those who only wanted to attend an interview for internship in Flutter and UI/UX, you may skip doing this task, you will have a different process which will be communicated later
- Use of AI tools like ChatGPT, Replit, Lovable or cursor etc. is encouraged and if used, please ensure you retain the prompting you have done to be displayed during the next round of interview

Best of Luck!