General purpose chatbot proposal

Course: Internet Engineering Lab

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Repository: *https://github.com/ART0F/SE-lab-chatbot*

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1. Project Summary

I will build a web application based on **Django** that provides general pupose ai generated content. Heavy computation and notebook-style logic will run inside a **Google Colab** notebook. A small **Flask** API inside the Colab session will expose endpoints and will be tunneled to the public web using **ngrok**. Django (hosted on a hosting provider in iran) will send requests to the Colab-exposed endpoints to run notebooks and retrieve results. The project demonstrates integrating web services, remote notebook execution, and secure tunneling.

2. Objectives

- Design a working prototype that links a Django frontend to a Colab notebook execution backend.

- Allow users to submit question requests from the Django UI and receive computed results produced by the notebook.

- Document the design and code, and publish the project and requierments on GitHub.

3. Technical Approach / Architecture (high level)

1. **Frontend & App**: Django handles user pages, authentication, and stores logs/results.

2. **Notebook Backend**: Colab hosts a Jupyter notebook + a Flask microservice. Notebook execution is triggered via the Flask endpoints.

3. **Tunnel**: ngrok runs in Colab to create a secure public HTTPS endpoint for Flask.

4. **Communication**: Django sends HTTPS POST requests with a JSON payload and an Authorization: Bearer <token> header. Flask validates token, executes notebook logic, and returns JSON with results or a link to the output notebook.

Simple flow:
User → Django UI → Django POST → ngrok URL → Flask (Colab) → run notebook → response → Django → User

7. Risks & Limitations

- **Colab ephemerality:** sessions and ngrok URLs expire when the Colab runtime restarts. This requires manual restart or automation.

- **Security:** ngrok exposes a public endpoint .

8. Required Resources

- hosting for running Django (or local development machine).

- Google account with Colab access.

- ngrok account (free tier).

- Basic Python libraries: Django, Flask, requests, pyngrok.