

**The Superior University Lahore**

**Faculty of Computer Science & Information**

**Technology**

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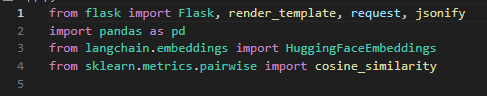
**Date: 28 April 2025**

**Subject: PAI LAB**

**LAB 13 TASK**

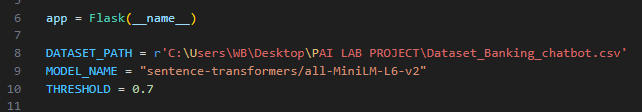
**Finance Chatbot**

1. **Importing libraries**

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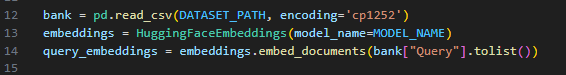
* **Flask:** To create a web application.
* **render\_template:** To render HTML templates.
* **request:** To receive user input from forms.
* **jsonify:** To send JSON responses.
* **pandas:** To load your dataset.
* **HuggingFaceEmbeddings:** To convert text into embeddings.
* **cosine\_similarity:** To compare vectors and find how similar two sentences are.

**2. Basic App Setup**

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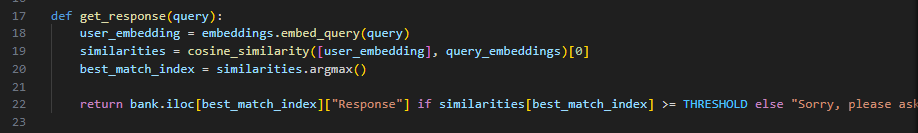
* **app = Flask(\_\_name\_\_):** Initializes the Flask app.
* **DATASET\_PATH:** Points to your CSV dataset.
* **MODEL\_NAME:** Chooses a small, fast sentence embedding model (all-MiniLM-L6-v2).
* **THRESHOLD = 0.7:** If the similarity score is above 0.7, the bot will answer; otherwise, it will say it doesn’t understand.

**3. Loading Data and Model**

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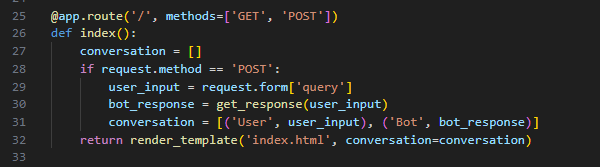
* Loads the CSV file containing pre-defined queries and responses.
* Initializes the sentence embedding model.
* Converts all the queries from the dataset into vectors (numerical form) for later matching.

**4. Getting Response Logic**

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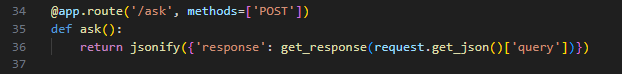
* **Step 1:** Embed the user's input.
* **Step 2:** Compare it with all precomputed query embeddings.
* **Step 3:** Find the most similar query.
* **Step 4:** If the similarity is above 0.7, return the associated response; otherwise, apologize.

**5. Web Routes**

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* Home Page (/)
* When the user opens the page, it shows an input form.
* When the user submits a question (POST request), it fetches a bot response and displays both.

**AJAX Endpoint (/ask)**

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* Accepts a JSON request (e.g., from JavaScript on your HTML page).
* Returns the bot's response in JSON format.
* Useful for dynamic chatting without refreshing the page.

**6. Running the App**

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* Starts the server in debug mode, so it automatically reloads if you make code changes.