🗄️ Database & Project Setup Documentation

This document explains how to set up **PostgreSQL**, configure the database, and run the **backend + frontend** of the project.

1️⃣ Install PostgreSQL

- Download **PostgreSQL v16**
- Link: https://www.postgresql.org/download/
- During installation:
    - Set **username** (example: `postgres`)
    - Set **password** (remember this)
    - Keep default port: 5432

2️⃣ Create Database Server & Database

1. Open **pgAdmin**
2. Connect to PostgreSQL server
3. Create a new database:

```
Chatbot_Db
```

3️⃣ Enable Required Extension

Open **Query Tool** in pgAdmin and run:

```
CREATE EXTENSION IF NOT EXISTS pgcrypto;
```

4 Create Database Tables

◇ Users Table

```
CREATE TABLE users (
   user_id BIGSERIAL PRIMARY KEY,
   email TEXT UNIQUE NOT NULL,
   password_hash TEXT NOT NULL,
   is_active BOOLEAN DEFAULT TRUE NOT NULL,
   created_at TIMESTAMP WITH TIME ZONE DEFAULT now(),
   last_login TIMESTAMP WITH TIME ZONE
);

SELECT * FROM users;
```

◇ User Configuration Table

```
CREATE TABLE user_config (
   config_id BIGSERIAL PRIMARY KEY,
   user_id BIGINT UNIQUE REFERENCES users(user_id) ON DELETE CASCADE,

   enable_memory BOOLEAN DEFAULT TRUE,
   enable_multichat BOOLEAN DEFAULT TRUE,
   enable_chat_history BOOLEAN DEFAULT TRUE,
   enable_rag BOOLEAN DEFAULT TRUE,
   enable_tool BOOLEAN DEFAULT TRUE,

   max_sessions INT DEFAULT 5,
   max_tokens INT DEFAULT 4096,

   created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
   updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
```

```
);

SELECT * FROM user_config;
```

◇ Chat Sessions Table

```
CREATE TABLE chat_sessions (
   session_id UUID PRIMARY KEY DEFAULT gen_random_uuid(),
   user_id BIGINT REFERENCES users(user_id) ON DELETE CASCADE,

   session_title TEXT,
   is_active BOOLEAN DEFAULT TRUE,
   created_at TIMESTAMP WITH TIME ZONE DEFAULT now(),
   ended_at TIMESTAMP WITH TIME ZONE
);
```

◇ Chat Messages Table

```
CREATE TABLE chat_messages (
   request_id UUID PRIMARY KEY DEFAULT gen_random_uuid(),
   session_id UUID REFERENCES chat_sessions(session_id) ON DELETE
CASCADE,

   role TEXT NOT NULL CHECK (role IN ('user', 'assistant', 'system')),
   content TEXT,
   token_count INT,
   created_at TIMESTAMP WITH TIME ZONE DEFAULT now()
);

SELECT * FROM chat_messages;
```

◇ Memory Store Table

```
CREATE TABLE memory_store (
   memory_id UUID PRIMARY KEY DEFAULT gen_random_uuid(),
   user_id BIGINT REFERENCES users(user_id) ON DELETE CASCADE,

   memory_type TEXT NOT NULL,
   memory_content TEXT NOT NULL,
   confidence_score FLOAT,

   is_active BOOLEAN DEFAULT TRUE,
   expires_at TIMESTAMP WITH TIME ZONE NULL,
   created_at TIMESTAMP WITH TIME ZONE DEFAULT now()
);

SELECT * FROM memory_store;
```

Check expired memories:

```
SELECT * FROM memory_store
WHERE expires_at <= now();
```

◇ Vector DB (RAG) Table

```
CREATE TABLE vector_db_rag (
   document_id UUID PRIMARY KEY DEFAULT gen_random_uuid(),
   user_id BIGINT REFERENCES users(user_id) ON DELETE CASCADE,

   embedding FLOAT8[] NOT NULL,
   metadata JSONB
);

SELECT * FROM vector_db_rag;
```

5 Configure Environment Variables

Inside your **project root** (or backend folder), set:

```
DATABASE_URL=postgresql://<username>:<password>@localhost:5432/Chatbot
_Db
```

Example:

```
DATABASE_URL=postgresql://postgres:admin123@localhost:5432/Chatbot_Db
```

6 Backend Setup & Run

```
cd backend
```

◇ Recreate Virtual Environment

```
# delete old venv folder first
python -m venv venv
venv/scripts/activate
pip install -r requirements.txt
```

◇ Start Backend Server

```
uvicorn main:app --reload --port 8000
```

Backend runs at:

http://localhost:8000

7️⃣ Frontend Setup & Run

Open **new terminal window**:

```
cd frontend
npm install   # run only once
npm run dev
```

Frontend runs at:

http://localhost:3000

☑️ Final Notes

- PostgreSQL must be running before backend starts
- `.env` file must contain correct `DATABASE_URL`
- Backend and frontend should run in **separate terminals**
- Database tables are auto-linked via foreign keys