Building ChatGPT plugins

Use Supabase as a Retrieval Store for your ChatGPT plugin.

ChatGPT recently released Plugins which help ChatGPT access up-to-date information, run computations, or use third-party services.
If you're building a plugin for ChatGPT, you'll probably want to answer questions from a specific source. We can solve this with “retrieval plugins”, which allow ChatGPT to access information from a database.

What is ChatGPT Retrieval Plugin?

A Retrieval Plugin is a Python project designed to inject external data into a ChatGPT conversation. It does a few things:

1. Turn documents into smaller chunks.
2. Converts chunks into embeddings using OpenAI's `text-embedding-ada-002` model.
3. Stores the embeddings into a vector database.
4. Queries the vector database for relevant documents when a question is asked.

It allows ChatGPT to dynamically pull relevant information into conversations from your data sources. This could be PDF documents, Confluence, or Notion knowledge bases.

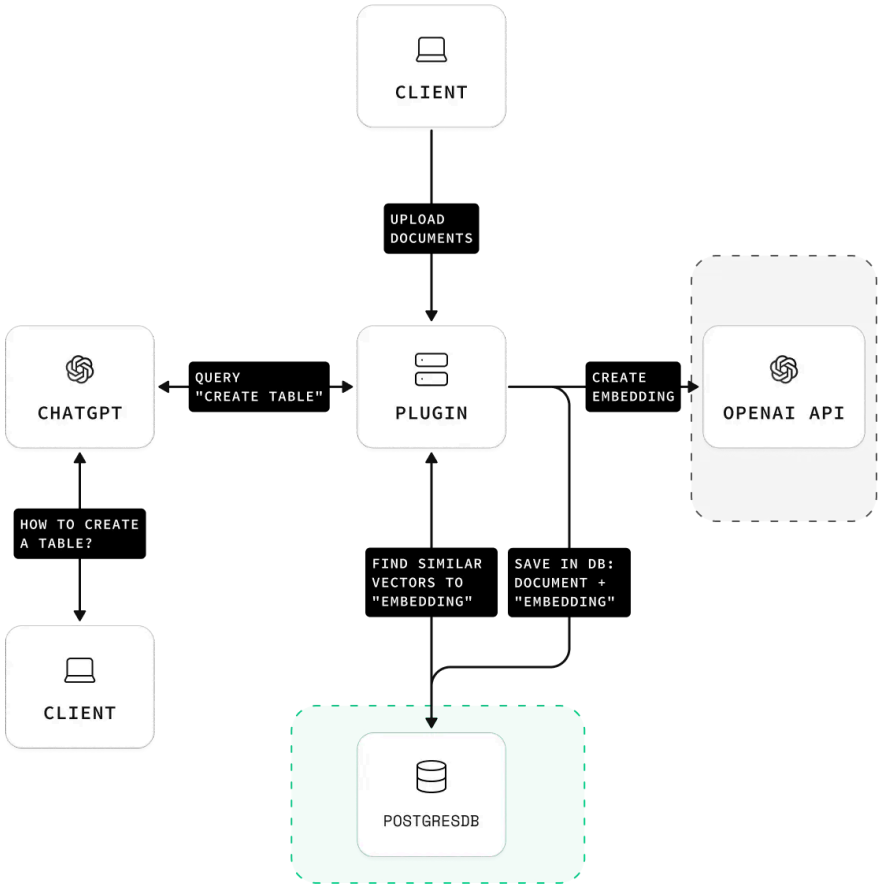
Example: Chat with Postgres docs

Let’s build an example where we can “ask ChatGPT questions” about the Postgres documentation. Although ChatGPT already knows about the Postgres documentation because it is publicly available, this is a simple example which demonstrates how to work with PDF files.

This plugin requires several steps:

1. Download all the Postgres docs as a PDF
2. Convert the docs into chunks of embedded text and store them in Supabase
3. Run our plugin locally so that we can ask questions about the Postgres docs.

We'll be saving the Postgres documentation in Postgres, and ChatGPT will be retrieving the documentation whenever a user asks a question:



Step 1: Fork the ChatGPT Retrieval Plugin repository

Fork the ChatGPT Retrieval Plugin repository to your GitHub account and clone it to your local machine. Read through the `README.md` file to understand the project structure.

Step 2: Install dependencies

Choose your desired datastore provider and remove unused dependencies from `pyproject.toml`. For this example, we'll use Supabase. And install dependencies with Poetry:

```
poetry install
```

Step 3: Create a Supabase project

Create a Supabase project and database by following the instructions here. Export the environment variables required for the retrieval plugin to work:

```
export OPENAI_API_KEY=<open_ai_api_key>
export DATASTORE=supabase
export SUPABASE_URL=<supabase_url>
export SUPABASE_SERVICE_ROLE_KEY=<supabase_key>
```

For Postgres datastore, you'll need to export these environment variables instead:

```
export OPENAI_API_KEY=<open_ai_api_key>
export DATASTORE=postgres
export PG_HOST=<postgres_host_url>
export PG_PASSWORD=<postgres_password>
```

Step 4: Run Postgres locally

To start quicker you may use Supabase CLI to spin everything up locally as it already includes pgvector from the start. Install `supabase-cli`, go to the `examples/providers` folder in the repo and run:

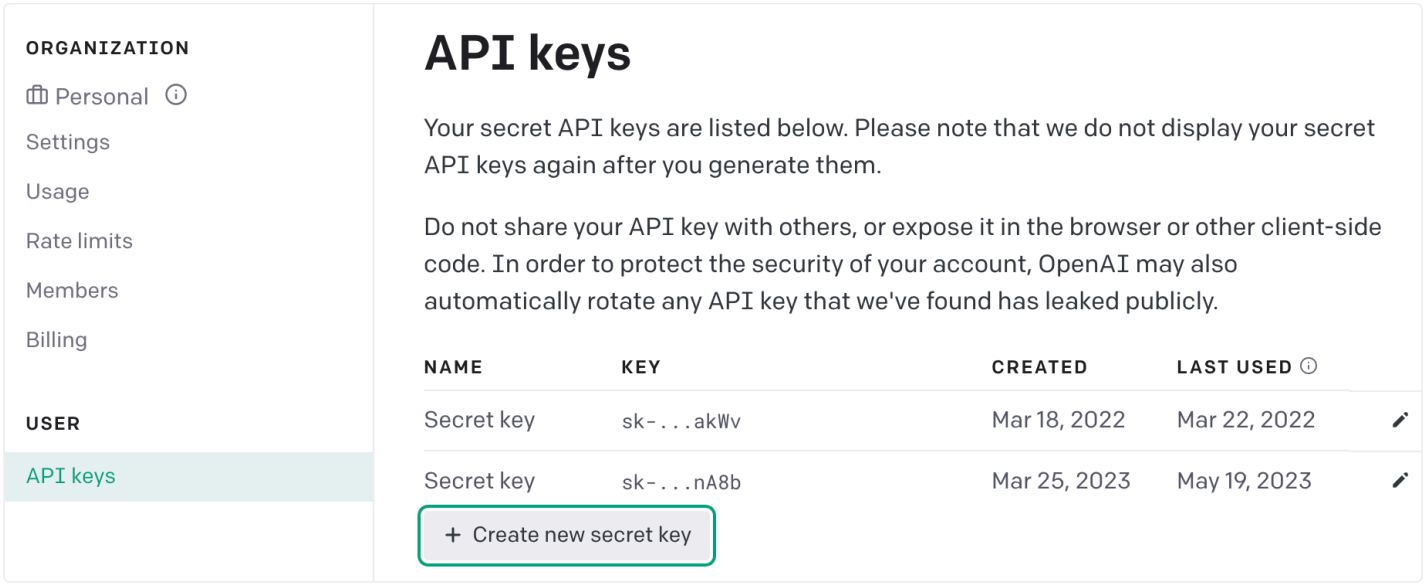
```
supabase start
```

This will pull all docker images and run supabase stack in docker on your local machine. It will also apply all the necessary migrations to set the whole thing up. You can then use your local setup the same way, just export the environment variables and follow to the next steps.

Using `supabase-cli` is not required and you can use any other docker image or hosted version of PostgresDB that includes `pgvector`. Just make sure you run migrations from `examples/providers/supabase/migrations/20230414142107_init_pg_vector.sql`.

Step 5: Obtain OpenAI API key

To create embeddings Plugin uses OpenAI API and `text-embedding-ada-002` model. Each time we add some data to our datastore, or try to query relevant information from it, embedding will be created either for inserted data chunk, or for the query itself. To make it work we need to export `OPENAI_API_KEY`. If you already have an account in OpenAI, you just need to go to User Settings - API keys and Create new secret key.



Step 6: Run the plugin

Execute the following command to run the plugin:

```
poetry run dev
# output
INFO:     Will watch for changes in these directories: ['./chatgpt-retrieval-plugin']
INFO:     Uvicorn running on http://localhost:3333 (Press CTRL+C to quit)
INFO:     Started reloader process [87843] using WatchFiles
INFO:     Started server process [87849]
INFO:     Waiting for application startup.
INFO:     Application startup complete.
```

The plugin will start on your localhost - port `:3333` by default.

Step 6: Populating data in the datastore

For this example, we'll upload Postgres documentation to the datastore. Download the Postgres documentation and use the `/upsert-file` endpoint to upload it:

```
curl -X POST -F \\"file=@./postgresql-15-US.pdf\\" <http://localhost:3333/upsert-file>
```

The plugin will split your data and documents into smaller chunks automatically. You can view the chunks using the Supabase dashboard or any other SQL client you prefer. For the whole Postgres Documentation I got 7,904 records in my documents table, which is not a lot, but we can try to add index for `embedding` column to speed things up by a little. To do so, you should run the following SQL command:

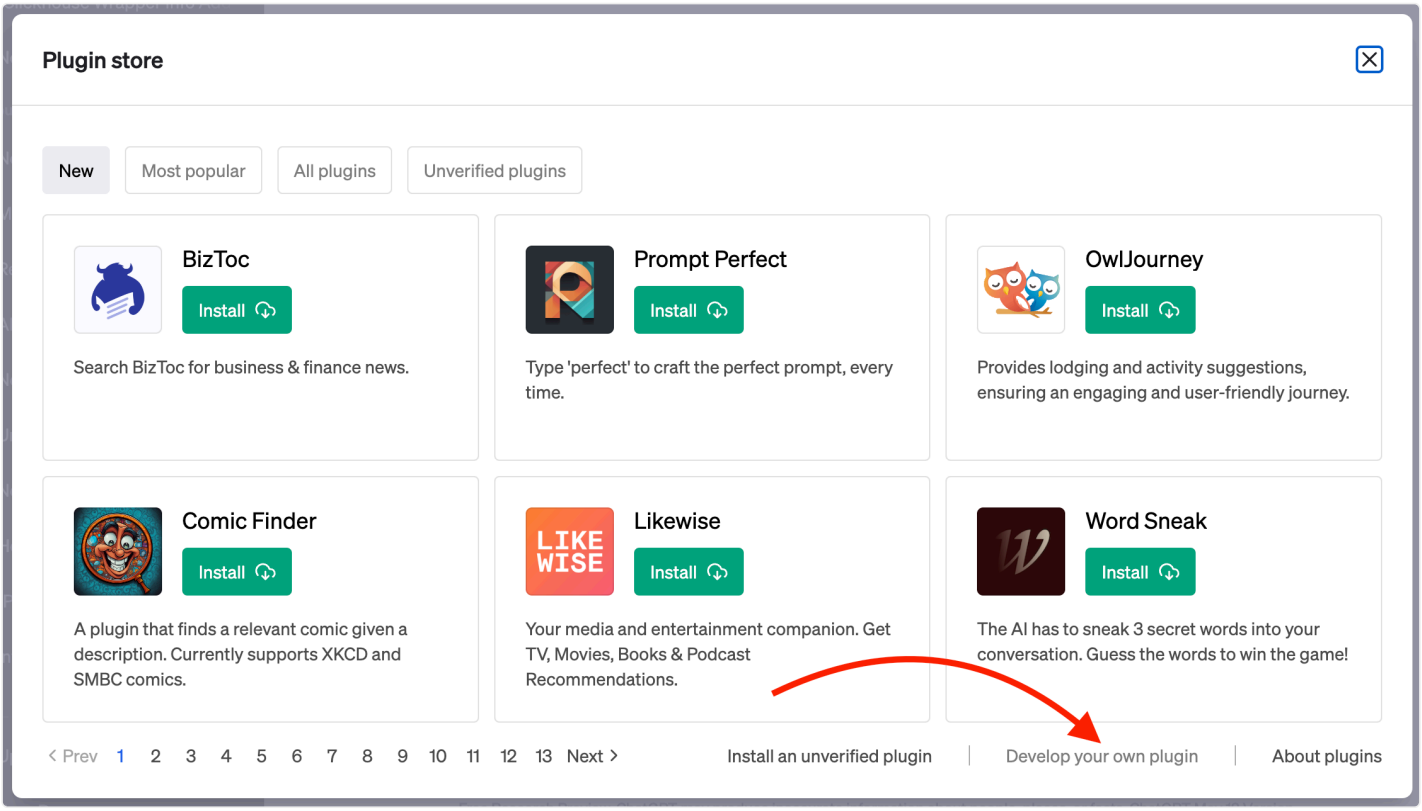
```
create index on documents
using hnsw (embedding vector_ip_ops)
with (lists = 10);
```

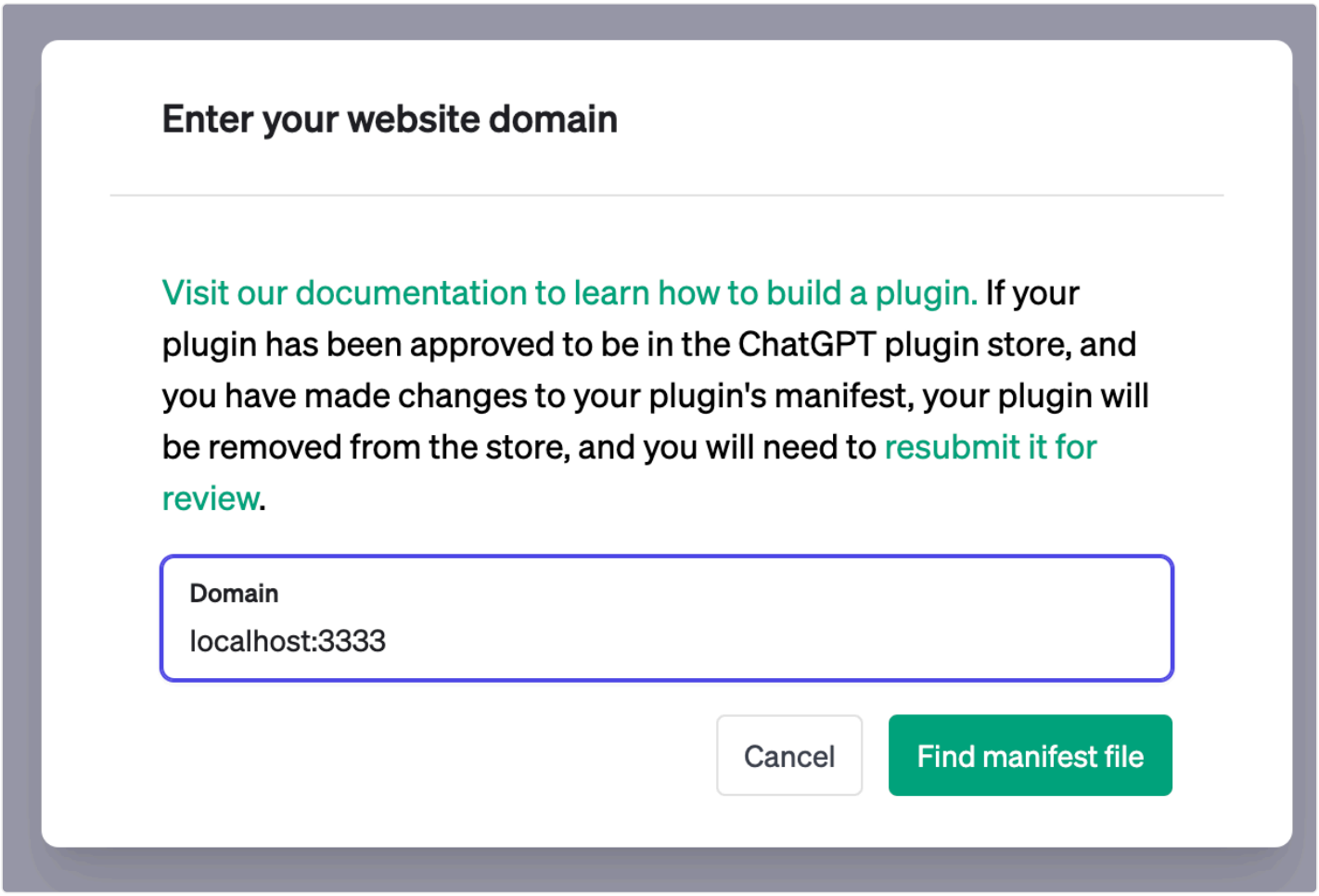
This will create an index for the inner product distance function. Important to note that it is an approximate index. It will change the logic from performing the exact nearest neighbor search to the approximate nearest neighbor search.

We are using `lists = 10`, because as a general guideline, you should start looking for optimal lists constant value with the formula: `rows / 1000` when you have less than 1 million records in your table.

Step 7: Using our plugin within ChatGPT

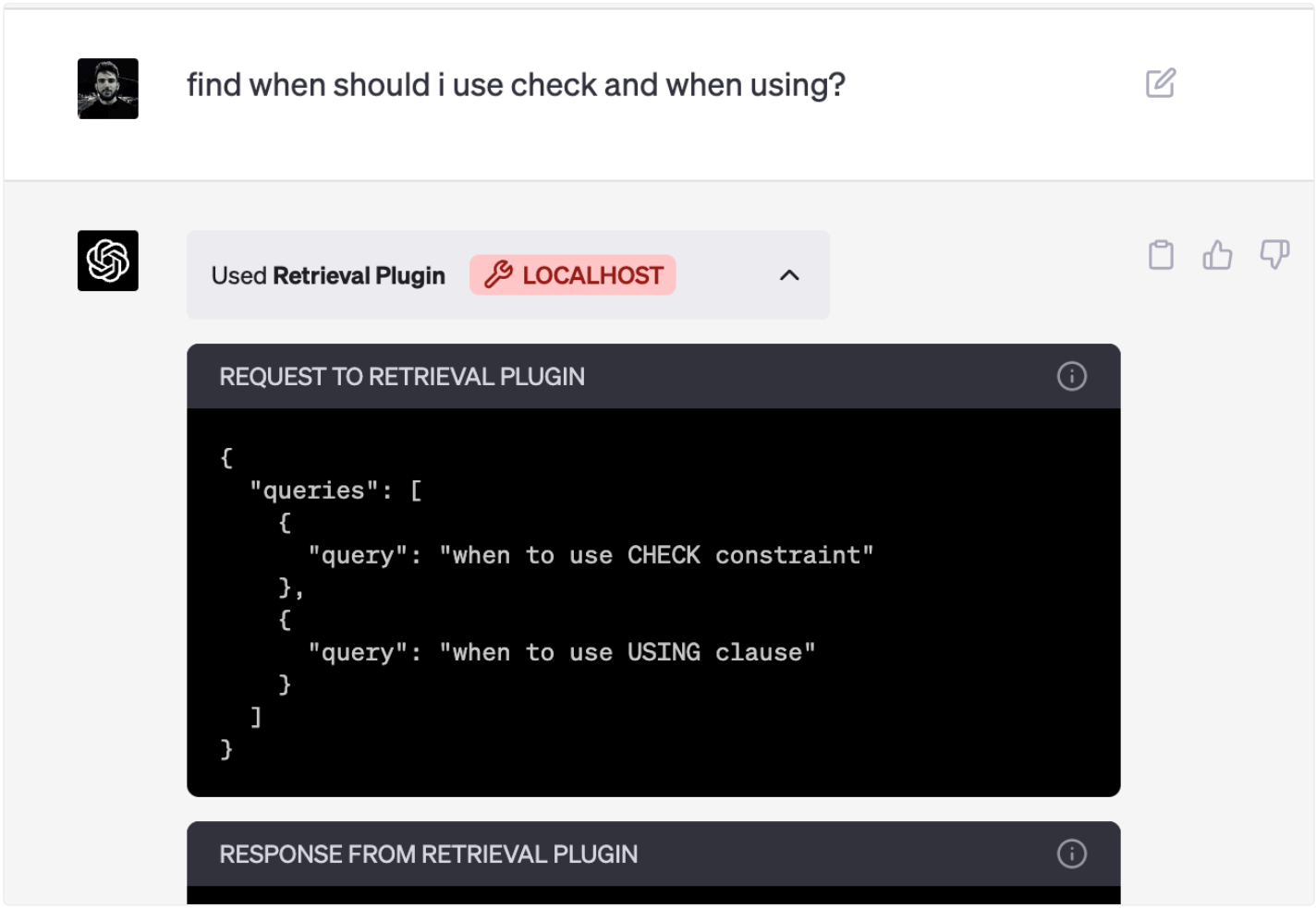
To integrate our plugin with ChatGPT, register it in the ChatGPT dashboard. Assuming you have access to ChatGPT Plugins and plugin development, select the Plugins model in a new chat, then choose "Plugin store" and "Develop your own plugin." Enter `localhost:3333` into the domain input, and your plugin is now part of ChatGPT.





You can now ask questions about Postgres and receive answers derived from the documentation.

Let's try it out: ask ChatGPT to find out when to use `check` and when to use `using`. You will be able to see what queries were sent to our plugin and what it responded to.



And after ChatGPT receives a response from the plugin it will answer your question with the data from the documentation.

Here's what I found in your documents:

1. **When to Use CHECK Constraint**:
   - The CHECK clause specifies an expression producing a Boolean result which new or updated rows must satisfy for an insert or update operation to succeed. Expressions evaluating to TRUE or UNKNOWN succeed. If any row of an insert or update operation produces a FALSE result, an error exception is raised and the insert or update does not alter the database.
   - A check constraint specified as a column constraint should reference that column's value only, while an expression appearing in a table constraint can reference multiple columns.
   - PostgreSQL assumes that CHECK constraints' conditions are immutable, that is, they will always give the same result for the same input row. This assumption is what justifies examining CHECK constraints only when rows are inserted or updated, and not at other times.
2. **When to Use USING Clause**:
   - A clause of the form `` `USING (a, b, ...)` `` is shorthand for `` `ON left_table.a = right_table.a AND left_table.b = right_table.b ...` ``. Also, USING implies that only one of each pair of equivalent columns will be included in the join output, not both.
   - `` `NATURAL` `` is shorthand for a USING list that mentions all columns in the two tables that have matching names. If there are no common column names, `` `NATURAL` `` is equivalent to `` `ON TRUE` ``.
   - In the context of RLS, the USING expression applies to what the UPDATE will be able to select as rows to be updated, and to the resulting updated rows, to check if they are permitted to be added to the table.

Resources

ChatGPT Retrieval Plugin: github.com/openai/chatgpt-retrieval-plugin

ChatGPT Plugins: official documentation

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Contributing

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