

## Lab 14. Cohere and LangChain - a Chatbot for PDF Files

### Objective:

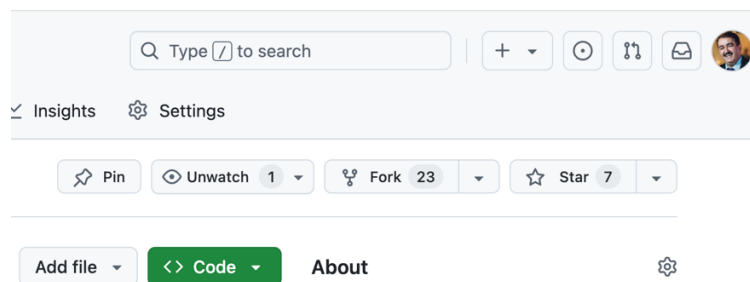
The project uses Chroma Vector Database running as container, NodeJS Typescript as backend and react as frontend for the ChatBot on existing set PDF Files.

**Disclaimer:** The Project is for study only. The code may not work as expected. For example the number of reference may not be exactly the same as the number of PDF Files. Also, there might be missing functionalities. You may use the project to understand the possibility of using LLM and RAG to build a custom chatbot.

1. Create an account on Github, if not already existing and login.
2. Visit the repository page

<https://github.com/Sangwan70/cohere-chatbot-pdf-chroma.git>

3. Click on **Fork** button to fork the repo to your Github account, so that you can change the code, upload your PDFs and add/finetune features.



4. Inside **docs** folder (in your Github account), upload your pdf files or folders that contain pdf files. You will be ingesting these files as your knowledge base. Commit the changes. Ensure that the PDF files are not password protected and file names are not space separated.
5. **Installing Node and NPM on Linux** (Skip this Step for OCI Instance. Proceed to Step 6)

- a. Download the setup script:

```
curl -fsSL https://rpm.nodesource.com/setup_23.x -o nodesource_setup.sh
```

- b. Run the setup script as root:

```
bash nodesource_setup.sh
```

- c. Install Node.js:

```
yum install -y nodejs
```

- d. Verify the installation:

```
node -v
```

- e. Open the port 3000 in to allow incoming connections

```
$ firewall-cmd --permanent --add-port=3000/tcp  
  
$ firewall-cmd --reload
```

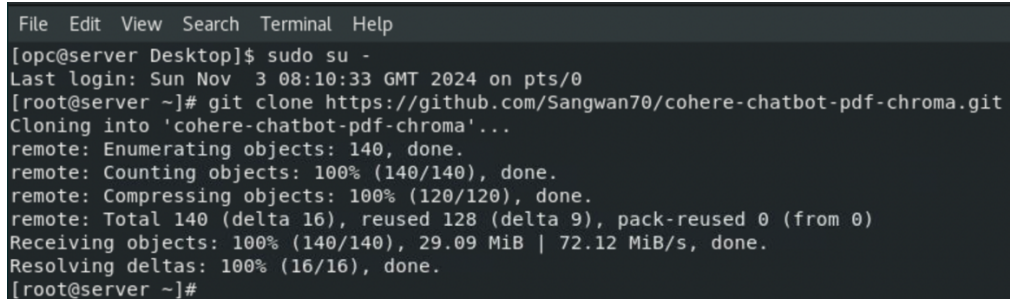
- f. Repeat the same on the Instance page in the security list of the Subnet in which you have your instance.

6. Now clone the forked repo or download the ZIP to your OCI Instance

```
git clone https://github.com/<Your User ID>/cohere-chatbot-pdf-chroma.git
```

### For Example:

```
git clone https://github.com/Sangwan70/cohere-chatbot-pdf-chroma.git
```



```
File Edit View Search Terminal Help  
[opc@server Desktop]$ sudo su -  
Last login: Sun Nov 3 08:10:33 GMT 2024 on pts/0  
[root@server ~]# git clone https://github.com/Sangwan70/cohere-chatbot-pdf-chroma.git  
Cloning into 'cohere-chatbot-pdf-chroma'...  
remote: Enumerating objects: 140, done.  
remote: Counting objects: 100% (140/140), done.  
remote: Compressing objects: 100% (120/120), done.  
remote: Total 140 (delta 16), reused 128 (delta 9), pack-reused 0 (from 0)  
Receiving objects: 100% (140/140), 29.09 MiB | 72.12 MiB/s, done.  
Resolving deltas: 100% (16/16), done.  
[root@server ~]#
```

7. Change to cloned repository and Install packages

```
cd cohere-chatbot-pdf-chroma
```

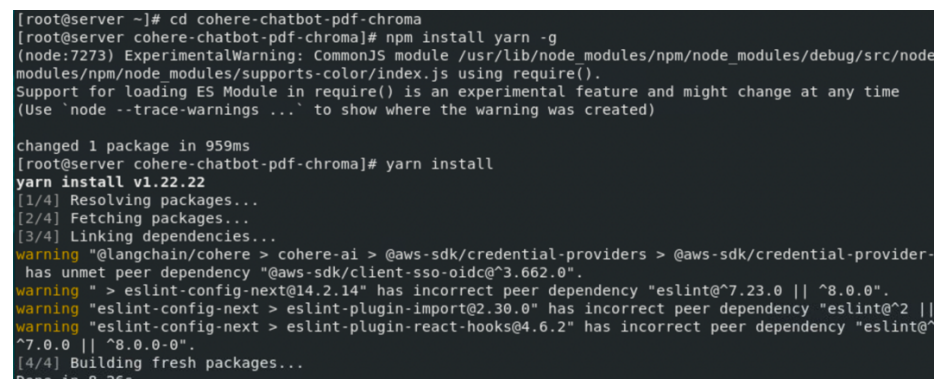
8. Install yarn globally with:

```
npm install yarn -g
```

9. Run the following command to install all packages from package.json file:

```
yarn install
```

*After installation, you should see a node\_modules folder.*



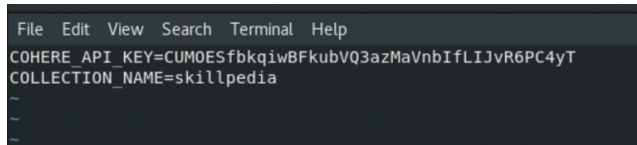
```
[root@server ~]# cd cohere-chatbot-pdf-chroma  
[root@server cohere-chatbot-pdf-chroma]# npm install yarn -g  
(node:7273) ExperimentalWarning: CommonJS module /usr/lib/node_modules/npm/node_modules/debug/src/node_modules/npm/node_modules/supports-color/index.js using require().  
Support for loading ES Module in require() is an experimental feature and might change at any time  
(Use 'node --trace-warnings ...' to show where the warning was created)  
  
changed 1 package in 959ms  
[root@server cohere-chatbot-pdf-chroma]# yarn install  
yarn install v1.22.22  
[1/4] Resolving packages...  
[2/4] Fetching packages...  
[3/4] Linking dependencies...  
warning "@langchain/cohere > cohere-ai > @aws-sdk/credential-providers > @aws-sdk/credential-provider-  
has unmet peer dependency "@aws-sdk/client-sso-oidc@^3.662.0".  
warning " > eslint-config-next@14.2.14" has incorrect peer dependency "eslint@^7.23.0 || ^8.0.0".  
warning "eslint-config-next > eslint-plugin-import@2.30.0" has incorrect peer dependency "eslint@^2 ||  
warning "eslint-config-next > eslint-plugin-react-hooks@4.6.2" has incorrect peer dependency "eslint@  
^7.0.0 || ^8.0.0-0".  
[4/4] Building fresh packages...  
Done in 8.26s
```

10. Create the .env file and paste the contents of the DotEnv file (shared by instructor) into this file.

```
# vi .env

# Copy the content from DotEnv File Provided.

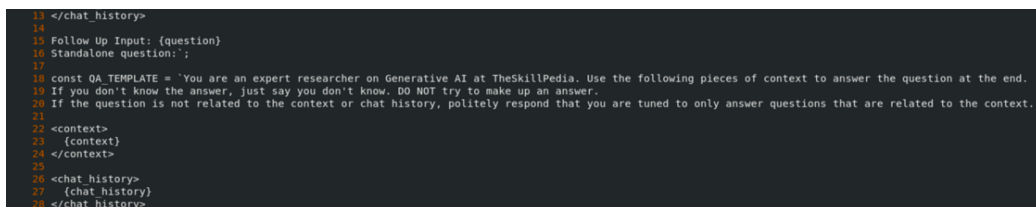
COHERE_API_KEY=
COLLECTION_NAME=skillpedia
```



```
File Edit View Search Terminal Help
COHERE_API_KEY=CUM0ESfbkqiWBFkubVQ3azMaVnbIfLIJvR6PC4yT
COLLECTION_NAME=skillpedia
~
~
```

11. In utils/makechain.ts chain, change the QA\_TEMPLATE in line no. 18 (**All Details from Line No 5 to Line No 19**) for your own use case. This will be the "Preamble" or "System Message" and will affect the response from chat bot.

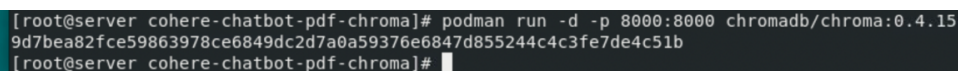
```
# vi utils/makechain.ts
```



```
13 </chat_history>
14
15 Follow Up Input: {question}
16 Standalone question: ;
17
18 const QA_TEMPLATE = `You are an expert researcher on Generative AI at TheSkillPedia. Use the following pieces of context to answer the question at the end.
19 If you don't know the answer, just say you don't know. DO NOT try to make up an answer.
20 If the question is not related to the context or chat history, politely respond that you are tuned to only answer questions that are related to the context.
21
22 <context>
23 {context}
24 </context>
25
26 <chat_history>
27 {chat_history}
28 </chat_history>
```

12. Run Chroma in the container with docker or **podman** (Podman is already installed on the Instance):

```
podman run -d -p 8000:8000 chromadb/chroma:0.4.15
```



```
[root@server cohere-chatbot-pdf-chroma]# podman run -d -p 8000:8000 chromadb/chroma:0.4.15
9d7bea82fce59863978ce6849dc2d7a0a59376e6847d855244c4c3fe7de4c51b
[root@server cohere-chatbot-pdf-chroma]#
```

## Convert your PDF files to embeddings

1. Run the script from **cohere-chatbot-pdf-chroma** directory to 'ingest' and embed your docs.

```
yarn run ingest
```

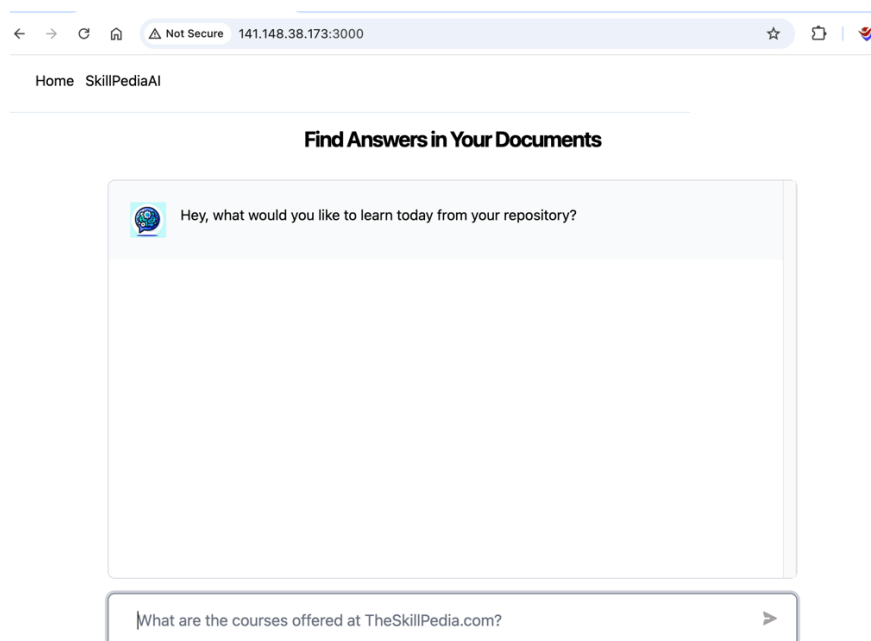
```
}
},
Document {
  pageContent: 'be added to aggregate to scale the cluster, and in the context of the cloud it also ens... +
  ... a high degree of portability, since developers are consuming a higher-level API to +
  that is implemented in terms of the specific cloud infrastructure APIs to +
  When your developers build their applications in terms of container images and to +
  deploy them in terms of portable Kubernetes APIs, transferring your application to +
  between environments, or even running in hybrid environments, is simply a matter of to +
  sending the declarative config to a new cluster. Kubernetes has a number of plug ins to +
  that can abstract you from a particular cloud, for example, Kubernetes requires know to +
  how to create load balancers on all major public clouds as well as several different to +
  state and physical infrastructures. Likewise, Kubernetes PersistentVolume s and to +
  PersistentVolumeClaim s can be used to abstract your applications away from spe',
  metadata: {
    source: 'file:///opt/gpt4-chatbot/pdf-langchain/docs/1403214422773.pdf',
    pdf: [Object],
    loc: [Object]
  },
  ... 1731 more items
]
Creating vector store...
Ingestion complete
Done in 16.98s.
[opc@genai gpt4-chatbot-pdf-langchain]$
```

## 2. Run the app with

```
npm run dev
```

To launch the local dev environment, and then type a question in the chat interface.

Launch the browser and open <http://localhost:3000>, Or visit your browser with <http://<Public IP>:3000>.



## 3. Ask a Question. Type a question about Responsible AI at Oracle. For example

"Tell me something about Responsible AI Policies at Oracle."

Not Secure 141.148.38.173:3000

Home SkillPediaAI

### Find Answers in Your Documents

Hey, what would you like to learn today from your repository?

Tell me something about Responsible AI Policies at Oracle.

Oracle's Responsible AI policies are centered around ensuring their AI systems are trustworthy, respectful, and aligned with human values. They advocate for a collaborative effort in promoting responsible AI to ensure its positive impact on society. Some of the key policies and procedures Oracle outlines include:

- Developing and Implementing Policies:** This involves creating and enforcing guidelines and procedures that ensure ethical AI practices are followed throughout the development and deployment process.
- Regular Audits and Assessments:** Oracle recommends conducting regular audits and assessments to ensure their ethical AI policies and procedures are being followed, and that ethical principles are upheld. This can be done through independent third-party audits or internal evaluations.
- Fostering a Culture of Responsibility:** Oracle promotes a culture where employees are aware of the importance of responsible AI and are encouraged to actively participate in ethical practices.
- Continuous Monitoring and Evaluation:** They emphasize the need to continually monitor and evaluate their AI systems to identify and mitigate

What are the courses offered at TheSkillPedia.com?

#### 4. Try a question not available in PDF Documents:

"Tell me something about Ram N Sangwan."

Tell me something about Ram N Sangwan.

I don't know. I am tuned to only answer questions related to the context provided.

Source 1

What are the courses offered at TheSkillPedia.com?

**The Chatbot has politely refused to answer since we have configured the system prompt to respond only if the question is related to the context provided.**