**🧙‍♂️ Hogwarts Knowledge Vault**

**Overview**

"Hogwarts Knowledge Vault" is an interactive question-answering system that allows users to query a Harry Potter knowledge base.  
Powered by **semantic PDF retrieval** and **agent-based character modeling**, it answers your questions *in the voice of different Harry Potter characters*.

* 🪄 **Semantic Search**: Extracts relevant context from the Harry Potter book.
* 🧠 **Character Analysis**: Adapts responses based on the selected character's style.
* ✍️ **Response Generation**: Final answers are personalized and maintain memory across conversations.

The app is built using:

* 🧠 **CrewAI**: Agent orchestration
* 📚 **FAISS**: Vector search for semantic retrieval
* 🧩 **Streamlit**: Clean, themed UI for interactions
* 📄 **YAML Configs**: Modular agent and task design

**Folder Structure**

pgsql

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data/

harry\_potter.pdf ← Source Knowledge Base

faiss\_index/

(vector storage)

src/

agents/

config/

agents.yaml ← Agent configurations

tasks.yaml ← Task configurations

harry\_potter\_crew.py ← Main Crew class (HarryPotterRAGCrew)

utils/

pdf\_processor.py ← PDF chunking + vector creation

tools.py ← Custom PDF search tool

app.py ← Streamlit frontend

requirements.txt ← Python dependencies

Readme.md ← Project documentation

**Backend Architecture**

**Agents**:

* retrieval\_agent: Performs **semantic search** inside the PDF.
* character\_analysis\_agent: Analyzes **character style** for answering.
* response\_generation\_agent: **Composes** the final user-facing response.

**Tasks**:

* retrieve\_context: Search for relevant content chunks.
* analyze\_character: Understand the selected character’s tone and style.
* generate\_response: Generate the final, stylistic answer.

**Crew Management**:

* Agents are coordinated in a **sequential** process using CrewAI’s Process.sequential.

**Frontend (Streamlit UI)**

**Features**:

* 📜 **Ask any question** about the Harry Potter universe.
* 🧙‍♂️ **Select a character** to answer in their "voice" (e.g., Dumbledore, Hermione).
* 💬 **Chat interface** with scrolling history.
* 🔄 **Clear conversations** anytime with a button.
* 🎨 **Custom Harry Potter-inspired theme** (Cinzel & Garamond fonts, dark Hogwarts-like look).

**Installation Instructions**

bash

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# Clone the repo

git clone <your-repo-url>

# Install dependencies

pip install -r requirements.txt

# Launch the app

streamlit run app.py

**Current Limitations**

* Memory is **not yet persistent** across long conversations.
* Works on a **single PDF** — only "Harry Potter" for now.
* No **user authentication** or **history saving**.

**Future Scope 🚀**

1. **Memory Management per Character**
   * Each character can develop a **personal memory**.
   * Example: If you ask Dumbledore about "Horcruxes" multiple times, he recalls past answers.
   * Use memory modules like:
     + CrewAI Memory
     + LangChain BufferMemory
     + or custom dictionaries based on character\_name.
2. **Upload New Books**
   * Allow users to **upload their own PDFs** to build new semantic vaults (other fantasy books?).
3. **Fine-tuning Character Personas**
   * Improve character\_analysis\_agent using **few-shot learning** or **style templates**.
   * Adjust vocabulary, humor, and tone depending on the character.
4. **Conversation Summarization**
   * Summarize past conversations into "Daily Prophet" style headlines! 📜
5. **UI Improvements (Light)**
   * Save chat history.
   * Add avatar icons (Dumbledore, Harry, etc).
   * Speech-to-text input.
   * Multi-question "Quizzes" based on Hogwarts lore.

**Possible Questions to Explore 🧠**

* How can Dumbledore explain the concept of Deathly Hallows differently from Hermione?
* What advice would Sirius Black give about friendship?
* If Hagrid described a hippogriff, what words would he use?
* How would Draco Malfoy answer if asked about "Muggle-borns"?
* Can we simulate an argument between Snape and McGonagall?
* How would different characters **summarize the Battle of Hogwarts**?

**🌟 Conclusion**

**Hogwarts Knowledge Vault** is not just a chatbot. It's a magical, character-driven retrieval-augmented assistant — setting the stage for even richer interactive fantasy worlds in the future!