**Intelligent Q&A System with PDF Document Retrieval and General Knowledge**

**Project Overview:**

This project is designed to build an **Intelligent Q&A System** that can answer queries based on PDF document content and general knowledge. It uses LangChain to orchestrate tool usage, leveraging a combination of document retrieval and large language models (LLMs). The system integrates a decision-making process to determine whether a query should be answered using document retrieval or general knowledge, ensuring the best possible response for each question.

**Features:**

**PDF Document Retrieval:** Allows the system to parse, index, and query PDFs to extract relevant information.

**General Knowledge LLM Integration:** Uses a pre-trained LLM to answer questions that do not require specific document context.

**Agent-Based Tool Selection:** An agent dynamically chooses whether to use document retrieval or general knowledge for answering a query based on the context.

**FAISS for Efficient Search:** FAISS indexing is used to enable fast and accurate similarity searches for chunked document embeddings.

**Streamlit Frontend:** A user-friendly interface built using Streamlit to input queries, view responses, and track tool usage.

**Configuration:**

**Agents and Tool Decision Logic**

The core of the system is built around an agent that selects the most appropriate tool based on the nature of the query:

**Document Retrieval**: Chosen when the query references specific content that is best answered with document context (e.g., "What are the main ideas from Chapter 3?").

**LLM General Knowledge**: Chosen for broad, well-known questions that do not need detailed document analysis (e.g., "What is space technology?").

**Tools Used:**

**LangChain**: For managing chains and agents.

**SentenceTransformers**: To generate embeddings for document chunks.

**FAISS**: For fast similarity searches through the embeddings.

**Streamlit**: Provides the frontend interface for users to interact with the system.