Action Plan: Agentic Research Assistant using CrewAI

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Phase 1: Design & Planning

- Define scope and features: search, summarization, citation, notes.
- Identify agents: Literature Reviewer, PDF Analyzer, Citation Generator, Note Keeper.
- Choose LLM: Preferably GPT-4 Turbo for high-context reasoning.
- List tools: arXiv API, PDFLoader, FAISS/Chroma, Crossref, JSON memory.

Phase 2: Tool Development

- Implement arXiv/Semantic Scholar search tool using API.
- Use LangChain PDFLoader to extract and split content.
- Set up vector store (Chroma or FAISS) for context-based QA.
- Develop citation parser tool with DOI/Crossref.
- Build JSON-based memory store for saving notes.

Phase 3: CrewAI Integration

- Define agents in CrewAI with goals, tools, and backstory.
- Assign tools to each agent according to responsibilities.
- Create tasks and workflows using the Crew class.
- Store outputs (summary, citations) using memory tool.

Phase 4: Testing & Evaluation

- Unit test each tool individually.
- Run integrated tests with full agent workflows.
- Evaluate quality and consistency of agent outputs.
- Tune prompts, improve tool chaining, and handle edge cases.

Phase 5: Deployment (Optional)

- Build simple interface (CLI or web UI).
- Add support for PDF upload, search bar, and history.
- Present summaries, key points, and citations cleanly.
- Persist notes and results in JSON for reuse.