AI Multi-Agent Research Crew

This project demonstrates an advanced application of Natural Language Processing (NLP) and Generative AI (GenAI) by implementing a specialized **Multi-Agent System (MAS)** to collaboratively write a detailed project proposal.

The crew is organized sequentially, mimicking a professional research and strategy team workflow.

Core Concept

The core idea is to break down a complex, creative task (writing a proposal) into smaller, specialized steps handled by distinct LLM-powered agents.

The Crew Hierarchy (Sequential Process)

Agent	Role	Key Function	Tool Access
Expert Research Analyst	Fact-Finder	Gathers real-time statistics and case studies on AI in healthcare.	Internet Search (SerperDevTool)
Senior Project Strategist	Planner	Analyzes research output to define a concise **Problem Statement** and clear **Project Objectives**.	None
Technical Proposal Writer	Editor/Composer	Integrates the facts and the structure into the final, professional 500-word proposal.	None

🛠️ Tech Stack & Dependencies

- **Language:** Python 3.9+
- **Agent Framework:** crewai (for multi-agent orchestration)
- **LLM Integration:** langchain-openai (Uses GPT-4o-mini)

- **External Tool:** crewai-tools (SerperDevTool for Google Search)

⚙️ Setup and Execution

1. Prerequisites

Before running, you must have an active subscription or credit for the following API services:

1. **OpenAI API Key** (sk-....)
2. **Serper API Key** (for Google Search access)

2. Installation

1. Clone this repository to your local machine:
   git clone [YOUR REPO URL WILL GO HERE]
   cd AI-MultiAgent-Research-Crew

2. Create and activate a virtual environment:
   python3 -m venv venv
   source venv/bin/activate

3. Install the required Python packages:
   pip install -r requirements.txt

3. API Key Configuration

Create a file named **.env** in the root directory and paste your keys inside the quotes:

OPENAI_API_KEY="YOUR_ACTUAL_OPENAI_KEY"
SERPER_API_KEY="YOUR_ACTUAL_SERPER_KEY"

4. Run the Project

Execute the main file. The output will show the complete collaborative thought process of all three agents, followed by the final proposal.

python multi_agent_sandbox.py