

Environment Setup :

I have successfully completed all the required setup steps:

1. Python 3.10+ is installed on the system.
2. A virtual environment (.venv) was created and activated for the project.
3. Core development packages were installed, including:
 - o LangChain
 - o LangGraph
4. All installations were verified by running basic import commands, confirming that the environment is properly configured.

Things I Learned About LangChain :

- LangChain is a framework that helps connect Large Language Models (LLMs) with external data, tools, and workflows.
- It provides ready-made components like prompt templates, chains, memory, and tools to build AI applications easily.
- It simplifies working with multiple models and tools in a structured way instead of writing everything manually.
- LangChain is especially useful for agents, question-answering, summarization, and automation tasks.
- It helps manage the flow of inputs and outputs between different steps of an LLM application.

Things I Learned About LangGraph :

- LangGraph is a framework built on top of LangChain for creating **multi-agent workflows** using a graph-based structure.
- It allows building AI systems where different agents or steps are connected like nodes in a graph.
- It supports advanced features like **state management, branching, loops, checkpoints, and human-in-the-loop updates**.
- LangGraph is useful for creating complex autonomous systems where the AI needs to plan, act, evaluate, and repeat.
- It gives more control over the entire workflow compared to simple chains.

The screenshot shows the PyCharm IDE interface. The left sidebar displays the project structure under 'Open_Deep_Researcher' with sub-folders 'venv', 'LangGraph', and 'External Libraries'. The main area features a search bar and navigation links like 'Search Everywhere', 'Go to File', 'Recent Files', and 'Navigation Bar'. Below is a terminal window titled 'Local' showing command-line output:

```
[notice] A new release of pip is available: 20.3.1->20.3.2
[notice] To update, run: python -m pip install --upgrade pip
(.venv) PS C:\Users\mdu\PycharmProjects\Open_Deep_Researcher\LangGraph>
(.venv) PS C:\Users\mdu\PycharmProjects\Open_Deep_Researcher\LangGraph> python -c "import LangGraph; print('LangGraph installed successfully')"
LangGraph installed successfully
(.venv) PS C:\Users\mdu\PycharmProjects\Open_Deep_Researcher\LangGraph> python -c "import LangChain; print(LangChain.__version__)"
1.9.7
(.venv) PS C:\Users\mdu\PycharmProjects\Open_Deep_Researcher\LangGraph>
```

The status bar at the bottom indicates 'Python 3.10 virtualenv e:\Open_Deep_Researcher\venv'.

This screenshot shows the successful setup of my project environment in PyCharm. The terminal output confirms that both **LangChain** and **LangGraph** were installed correctly inside the project's virtual environment. I also verified the installations by running import commands, which executed without errors and displayed the expected version information. This confirms that the core dependencies required for the project are properly configured and ready for use.