Research Agent – Project Documentation

i. Use of LLM for Reasoning

This project leverages a Large Language Model (LLM) in the **ReAct (Reasoning + Acting)** pattern. Here's how it works:

Reasoning Step

- The agent uses **ReAct** to alternate between *thought* and *action* steps.
- In each loop:
    1. **Thought**: The LLM reasons about what information it needs to answer the user query.
    2. **Action**: Based on the reasoning, it calls a tool (e.g., web search, document retriever).
    3. **Observation**: It receives the tool's output.
    4. **Reflection**: It analyzes the output and decides the next step.
- This continues until the LLM decides it has enough information to respond.

Why LLM reasoning matters:

The LLM isn't just fetching data — it's planning, inferring, validating, and making decisions dynamically based on intermediate results. This leads to higher-quality, context-aware outputs.