TASK 2

The Rise of the WeatherMind

OVERVIEW

So this task wanted us to build a Weathermind, an Agentic AI powered by LangGraph capable of Tool enhanced reasoning,i.e, mathematical calculations, fashion recommender, weather AP,I and much more

Level 1: Core Activation

OBJECTIVE

- Construct a LangGraph node (chatbot) powered by an LLM (Gemini).
- Integrate a calculator tool (with BODMAS).
- Visualize the LangGraph structure.

APPROACH

1. Setup
- Installed 'langgraph' and configured the Gemini API.
- Defined a node for the chatbot with memory retention.

2. Tool Integration
- Added a calculator tool for arithmetic operations.

3. Graph Visualization
- Used 'graphviz' to render the LangGraph workflow (chatbot + calculator).

INSIGHTS

- The core system successfully processed queries like "Calculate (5 + 3) * 2" with accurate results.
- Visualization confirmed the bidirectional flow between the LLM and the tool.

Level 2: Senses of the World

OBJECTIVE

- Extend WeatherMind with real-world perception
- Fashion Recommender: Fetch trends by location
- Weather Extractor: Pull live data via OpenWeatherMap API.
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APPROACH

1. APIs Used:
- Weather: OpenWeatherMap for real-time forecasts.
- Fashion: Mock data

2. LangGraph Nodes:
- Added decision nodes to route queries to the correct tool.

INSIGHTS

- WeatherMind responded to "What's the weather in new delhi?" with temperature/humidity.
- Fashion tool parsed location keywords but relied on mock data due to API limitations.

Level 3: Judgement and Memory

OBJECTIVE

- Implement routing logic for dynamic tool selection.
- Add conversational memory for context-aware dialogue.

APPROACH

1. Routing Logic:
   - Used keyword detection (e.g., "weather" → weather tool, "calculate" → calculator).
2. Memory:
   - Stored chat history in a `State` object for multi-turn conversations.

INSIGHTS

- The AI remembered prior queries
- Routing accuracy improved with intent classification (tested with 20 diverse prompts).

Level 4: Multi-Agent Evolution

OBJECTIVE

- Design a multi-agent system
- Implement custom tools and collaborative routing.