TASK 1: EXPLORING AGENTIC AI, GENERATIVE AI ,LLMS AND 01_ai_agents_first REPOSITORY TILL HELLO AGENT

✅What is Generative AI?

Generate means to create right? So it basically creates images, text, vidoes etc. It learns form existing data and create new content each time. It learn patterns and structures from training data (transformers) ⚡ Where do we use these?

- In chatbots
- for code generation
- Story telling And many more!

Examples:-

Chatgpt,

Gemini etc

✅What is Agentic AI?

It's not only chatbot, but also works like a personal assistant that does realtime work for you! Like booking flights, getting enrolled somewhere, Sending emails etc. Means now here you can also make or generate things but also make them do realtime work by giving them access to your data or computer Technically Agentic AI refers to an LLM wrapped inside an agent architecture

Examples:-

OpenAI agents SDK Autogpt LangChain

✅What is an LLM?

LLMs are brains behind generative AI LLM stands for large language model basically transformer based model trained on large text. It predicts the next token in a sequence

Example:-

You: "I want to bake a chocolate" LLM: "cake, here's a simple recipe....." So in this example you can how LLM predicted the next sentence! They break words into chunks (tokenizing inputs) and then predict next token based on previous tokens

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⚡ SO WHY WE USED THEM TOGETHER?

Consider:- You build an agent (Agentic AI) that uses LLM (GPT or Gemini) to generate answers (generative AI)

Exploring ai_agents_first repository 💫

➞00. Swarm : Swarm basically humare pass ik experiment tha to manage multiple agents at a same time and organise these agents too, har agent KO pata Hoga Ke:-

1. Agent:- usse Kiya task perform krna hai
2. Handoff:- Kab task KO doosre agent tk phuchana hai

Ab swarm to humare pass experiment tha lekin iss experiment a real version hai OpenAI's SDK (pro version of swarm) ab hum real world me agents Bana sakte Hain not just for testing! Iske sath sath SDK Kuch naye features Ke sath BHI Ata hai like:-

1)More tools

2) Easy to build

3) Production ready (for launching)

⭐ ANTHROPIC DESIGN PATTERN:-

Now to make agents work like a pro anthropic (company) gave us some design patterns or blueprints, OpenAI'S SDK also follow these blueprints, these are:-

✅ 1) Prompt Chaining:-

Breaking the big steps into smaller ones, Matlab ik agent ik task handle krega then pass it to the other agent to handle it Hese maths problem MEI steps follow krte Hain and each step is dependant on the latest one! Bilkul wese hi

✅ 2) Routing:-

Sahi agent Ke pass user Ka question bhjna like if a user asked something related to countries then the system will pass it to the countries bot (this is done through Handoff mechanism)

✅ 3) Parallelization:-

Ik hi sath bhut Sare Kam krna , Like multiple agents working at same time! For example one agent is writing content while other is checking spellings

✅ 4)Orchestrator-workers:-

It is like a boss! Handling all agents and giving tasks to agents like tum content likho, tum images banao, aur tum grammar Sahi Karo

✅ 5) Evaluation Optimizer:-

It's the judge! Yeh suggest krega Ke agents kesa Kam krre Hain and also tell them to improve (optimization) The evaluator agent checks all this, this improves performance of the agents

In short the developers can implement these design pattern and build robust and efficient Agents ✨

➞01. UV:-

UV is a modern, high performance package manager for python basically replacement for pip. It is written in Rust(programming language) Key points:- ✅ It is super fast - pip SE 100 times faster ✅ Creates venv easily ✅ Memory efficient - Kam RAM use krta ha ✅ Compatible with existing tools eg: pi

⭐ UV Vs pip/virtual environment:- Pip aur venv dono alag alag cheezen Hain (pip install krega packages aur venv environment banayege) But UV dono Ka combination ha ik hi tool Sare Kam krra hai In short using UV is much more better then pip because it has alot of benefits!

➞02. OpenRouter:-

Open router is like a middleware, basically connecting your API call to the best and suitable LLM without wrestling with different API keys, endpoints etc. The single API endpoint of OpenRouter connects you to different APIs for different LLMs Think of an example of internet router(OpenRouter) that thing catches signals for internet (Different API endpoints) and transfers it your device to make things work(API call)

➞03. LiteLLM

LiteLLM is a python SDK that simplifies our interactions with over 100 LLMs from various providers Yani apko code har bar code dobara likhne ki zaroorat Nahi parti LiteLLM khud ik universal connector bn Jata hai Jo AI models Ke darmiyan ik bridge create krdeta hai iss SE development Ka process fast hojata hai aur apko bar bar code likhen ki zaroorat Nahi parti! Humlog Kabhi BHI Kisi BHI AI model Ke between switch kr sakte Hain without changing the whole code!

➞4. Async/sync:-

✅ **Asynchronous:-**

Asynchronous refers to the execution of tasks in a program where tasks can run without other tasks to finish For example:- On a wide road multiple cars can pass and each car can move without other cars to move

✅ **Synchronous:-**

Synchronous refers to the execution of tasks in a program once at a time, each task wait for the previous one to finish before it begins For example:- Standing in a single line of taking food orders we can move forward only when the person finishes taking his food!