Reasoning Models (llm notes)

openai o3
deepseek R1
etc.

- reasoning models are Ai models that are designed to go beyond pattern matching and perform logical step by step thinking like solving a math or coding problem

- these models aim to mimic human style thinking (AKA CRM)

Reasoning	vs Regular LLM	Ex of reasoning tasks
• Perform logical steps	• predicts next word	• Math word problems
• Good at solving multi step problems	• Good at fluent text generation	• logic
• can think through one step by step	• often shallow (first instinct)	• puzzles
		• code gen / debug
		• Chain of thought explaining

- How do they reason: 1) chain of thought (CoT) : encourages step by step output 2) tool use : API / calculators / web 3) Reinforcement learning : optimize reasoning with feedback 4) External memory : store intermediate steps

Ex prompt: Alice has 3 egg gives 2 to bob how many left

Regular LLM: 1 egg (wrong)

Reasoning model w CoT: Alice starts with 3 egg gives 2 to bob so 3-1=2 egg left

Agents

- a AI Agent can perceive reason, decide and act in a env
- its not just a chatbot it can plan/use tools and interact with the world using api
- A agent is typically a LLM powered system
- in short Agents = LLM + tools + thinking + purpose

Component : Description

Brain : usually a LLM
perception : can see current state
Goal : has a objective
planner : Decides next action
tools : external tools (web / calculator / etc)
Memory : can store context & prev steps
output : final output or task completion

Ex: find best bbq under 50$ in 72

1) search web
2) scrap reviews
3) use LLM to summarize
4) return ranked list

→ LLM cannot do this Agent can