

Agenda

20 December 2025 17:44

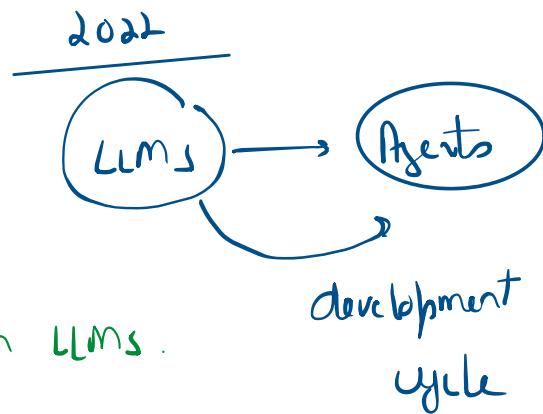
Crew AI → Build Multi Agent systems / workflows.

- Goal →
- 1) Important concepts
 - 2) Code Implementation
 - 3) Project → Solidify

multi Agent systems

What are AI agents ?

Now agents are diff. from LLMs.



Introduction

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ChatGPT → LLM (large language model)

AI models → Natural language understanding

trained

next word prediction

Prompt → User intent

↓

(complete)

Prompt as input

↓

complete

→ word by word

→ n_i — —

Chatbot

Input

Output

Input

Output

Turn by turn

further trained → User prompts

output → Feedback → RNN

Free form text generation

Images

→ Images → text
Text → Images

↓

Modalities

Audio, Video

Human Readable

Machine Readable

Structured data

→ structured output

→ JSON
(API)

→ Prompts

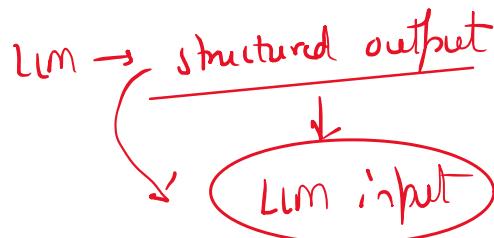
Structure your

Pydantic

Well defined format → Machine Readable

LLM → Human

Human → LLM



My name is Nimanshu, I am 34 yrs old and I teach about DS

JSON → { name: Nimanshu,
age: 34,
topic: DS }

LLMs → simple prompts . Context

Complex

multiple questions
points

→ User intent &

LLM → calculation

W

Prompting → COT (Chain of Thought)

step by step

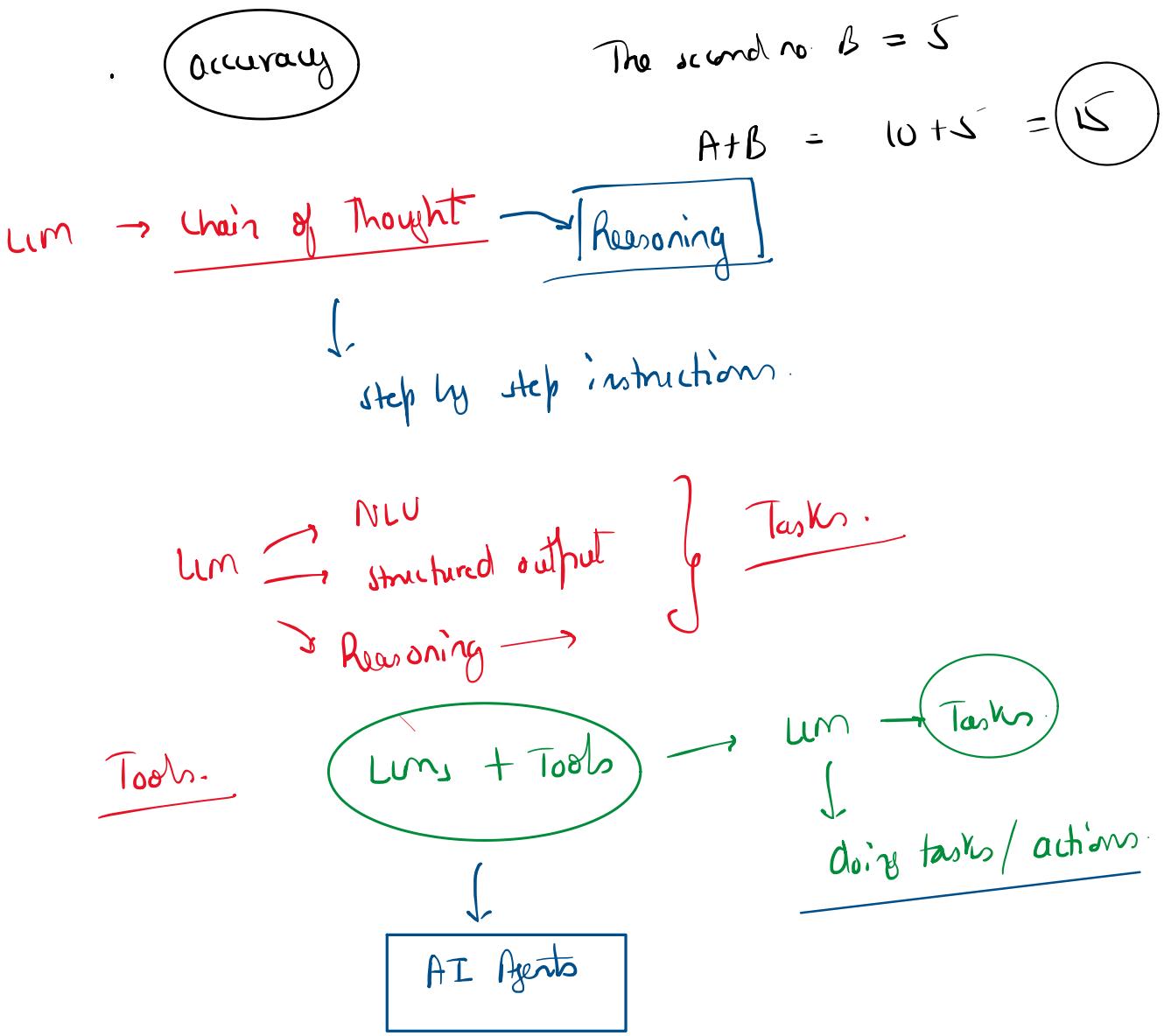
step by step

Addition

The first no. A = 10

. accuracy

The second no. B = 5



Recap:

- 1) Lms are good at NLU
- 2) Structured output
- 3) Reasoning
- 4) Agents

Components of Agents

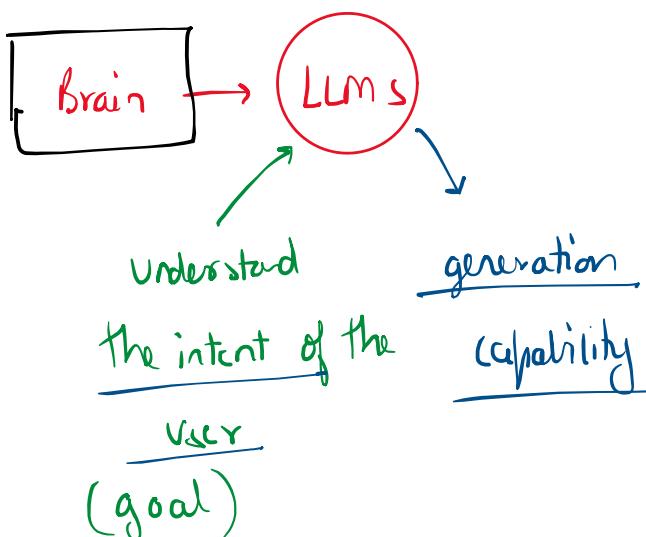
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AI Agents

LMs + Tools } → To perform actions /
do tasks



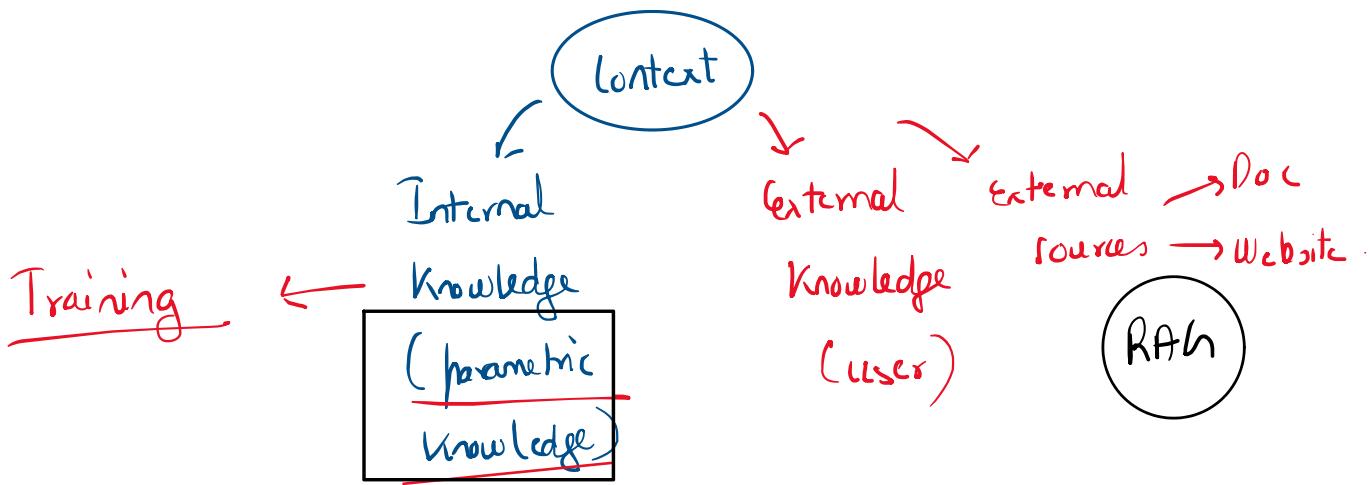
Brain (cognitive abilities)
Memory (knowledge, context)
Tool (Perform Actions, No tasks)



Planning,
Reasoning

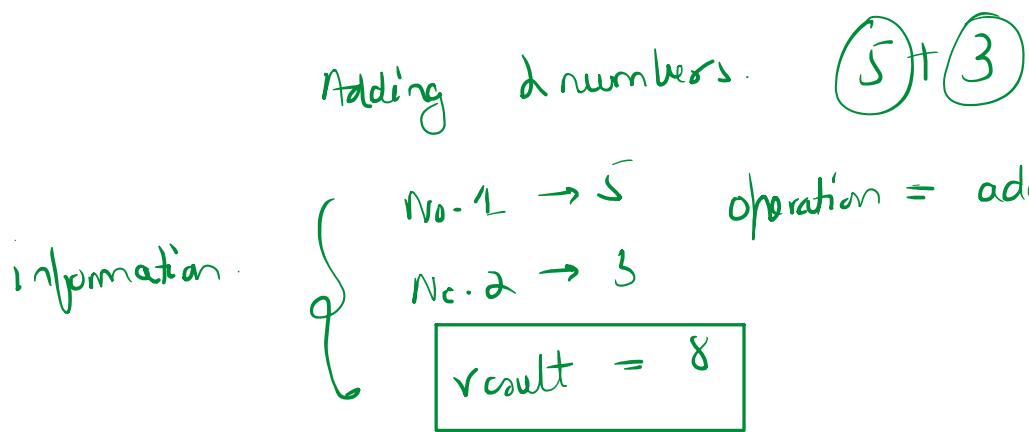
RAM → temp data.
a) Memory → knowledge, context / information my agent has.

Databases
VS/UD



Memory has 3 types:-

- 1) short term memory → To store information to perform the current task.



- 2) long term memory → To exchange information between sessions.

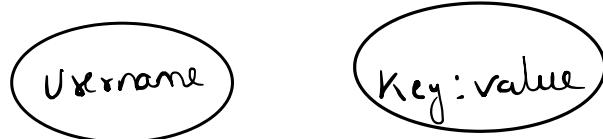
Prompt → Add 5 and 3 and multiply the

Task 1 = No. 1 = 5 opr = add
 No. 2 = 3
 result by 3
 result = 8

No. 1 = 8 opr = multiply

$$\begin{array}{l}
 \text{Tag 1} \\
 \text{No. } 1 = 8 \\
 \text{op} / \times = \text{multiply} \\
 \text{No. } 2 = 3 \\
 \text{result} = 24
 \end{array}$$

3) Entity based memory → User preferences
User information



③ Tool → Python functions / API
 ↓
 Hands of Agent → Thinkers → Doers.

No → Unique signature

Python function → Tool decorator.

✓ @ tool → Tag.
def add - number (a: int, b: int) → int :
 ↴ Takes two nos and return //
 return a+b

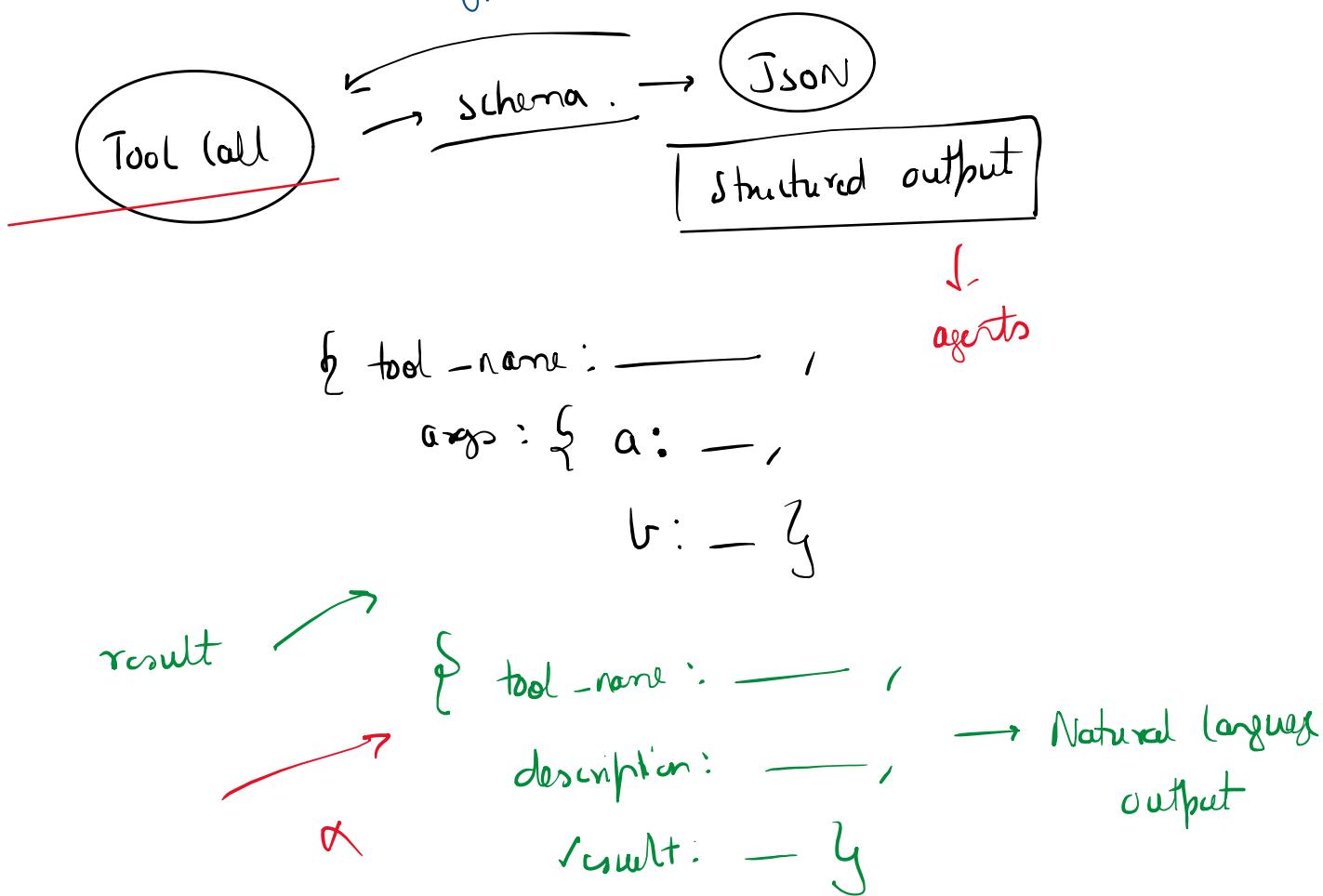
inputs , outputs

tool inputs , outputs expect → Type annotation .

Tool description → Describe your tool ,
inputs and what output

Tool description! → Define your ---, inputs and what output to expect.

- 1) Add tool @ tool to your function.
- 2) You add a docstring
- 3) You add type hints



No $8+2$ → Calculator tool.

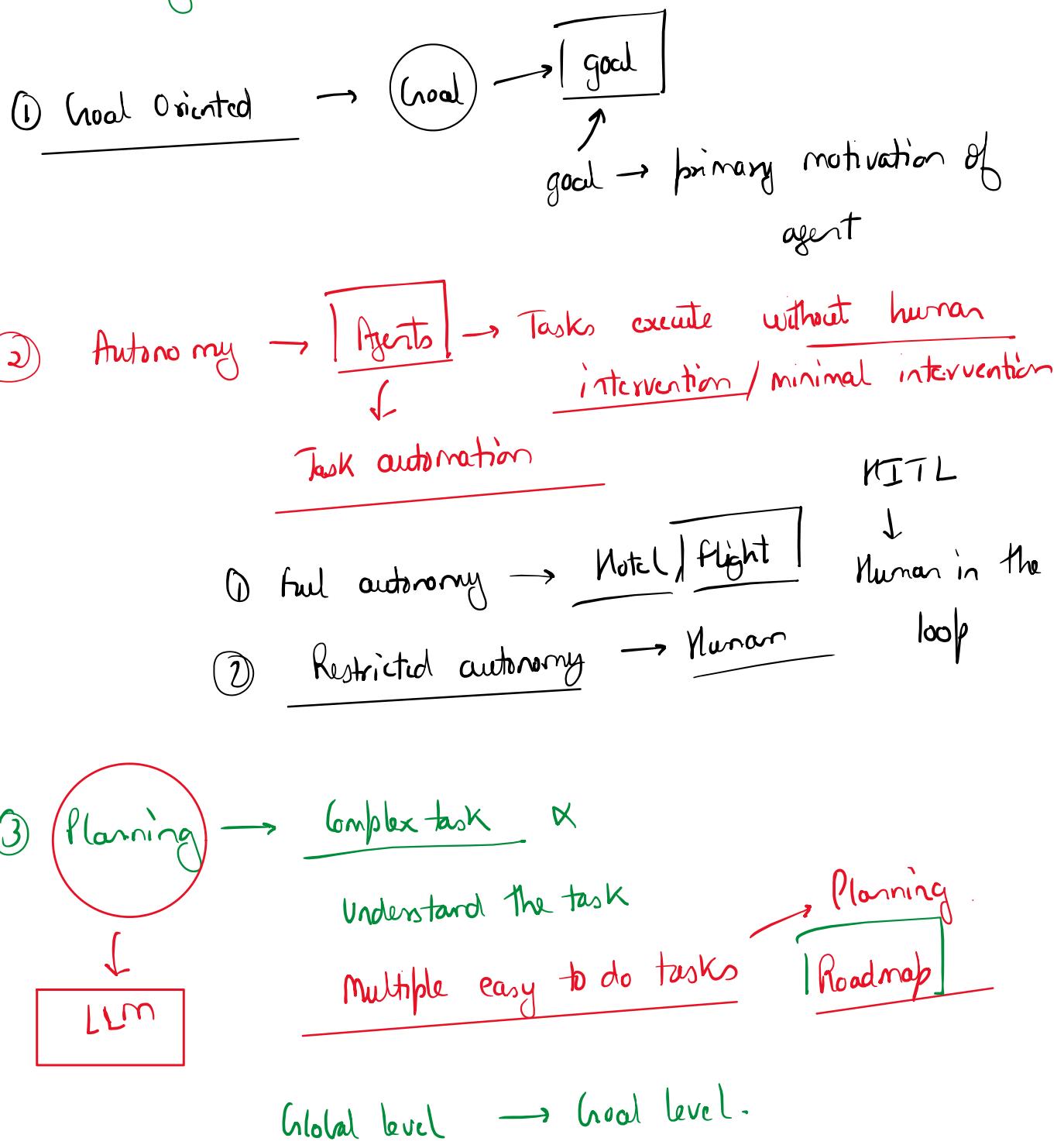
The sum of 8 and 2 is 10

tools list [{
 tool name: } , { }]

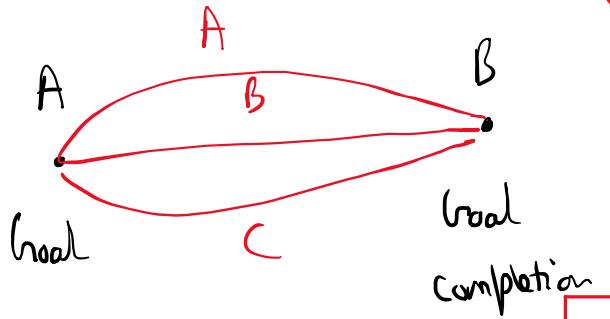
Characteristics of Agents

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- 1) Goal oriented
- 2) Autonomous /Autonomy
- 3) Planning
- 4) Research
- 5) Adaptability
- 6) Orchestration -



Reasoning



~~Best Plan~~ → It depends.
User

'trip plan'

sea facing resort

cheapest travel.

Multiple tasks

4) Reasoning → cognitive ability of your agent
to perform certain tasks.

sub task

10 tasks

→ local level

→ global level.
Goal → Inf. from
Delhi to Goa

Planning

Planning

Goal level

Roadmap

Reasoning

Task level

Device a way to complete task

5) Adaptability → Agent adaptable.

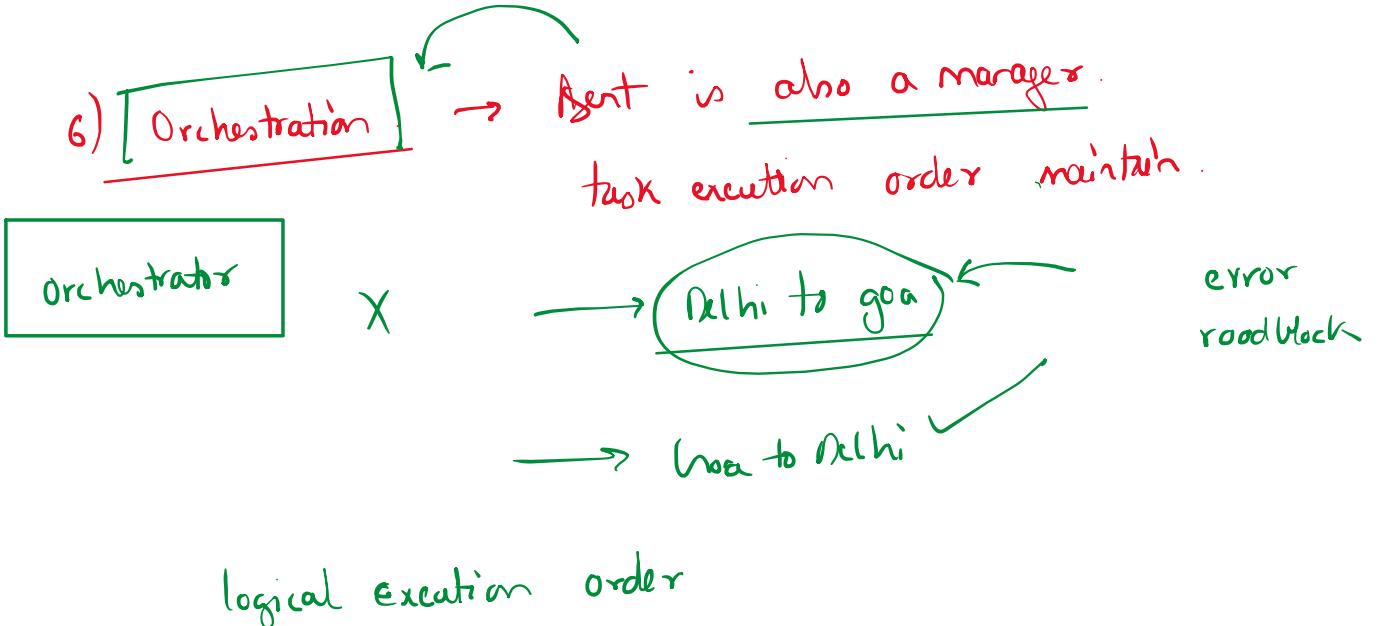


roadblocks in execution.

dynamically

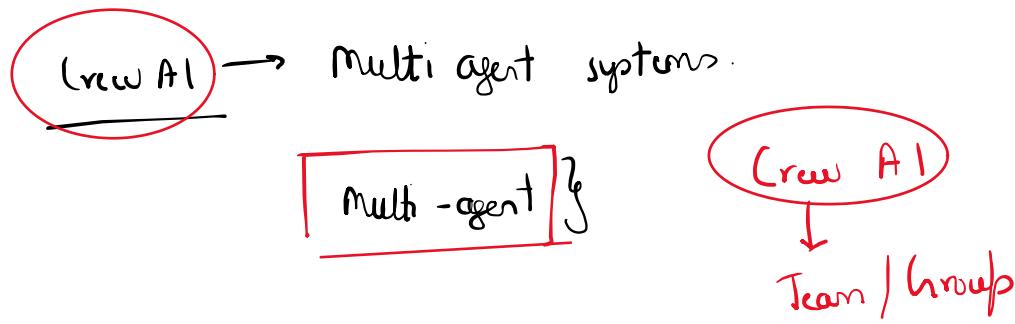
Plan change

~~API~~

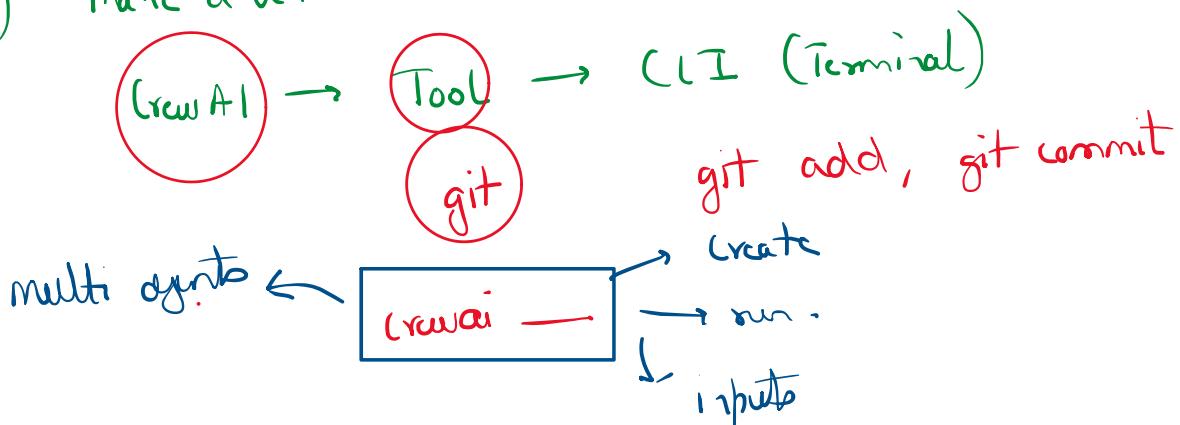


CrewAI Philosophy

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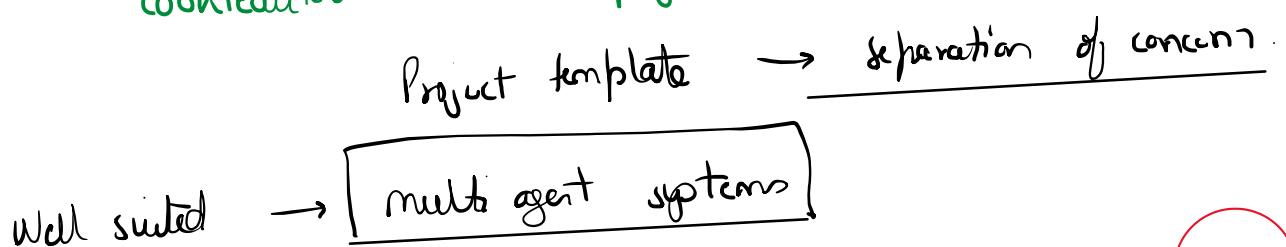


1) Make a venv → lib install. *



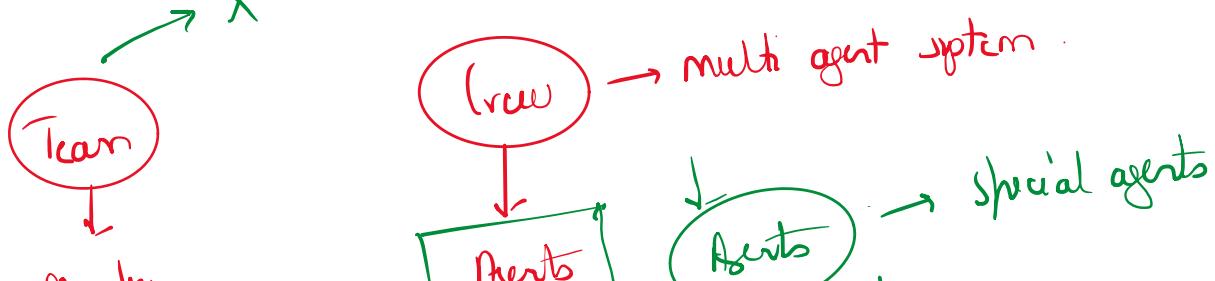
2) Crew AI → Readymade Project Template.

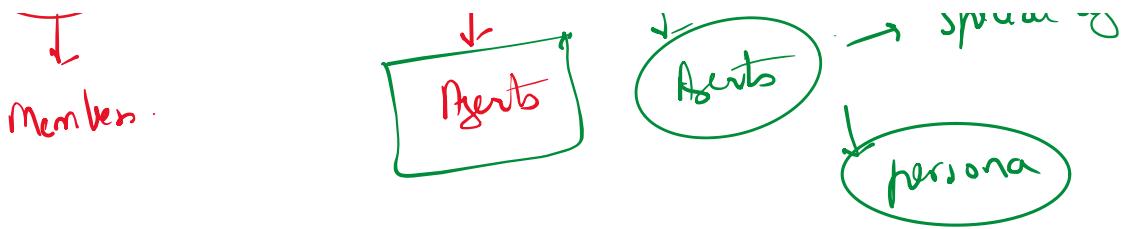
Cookicutter → DS projects



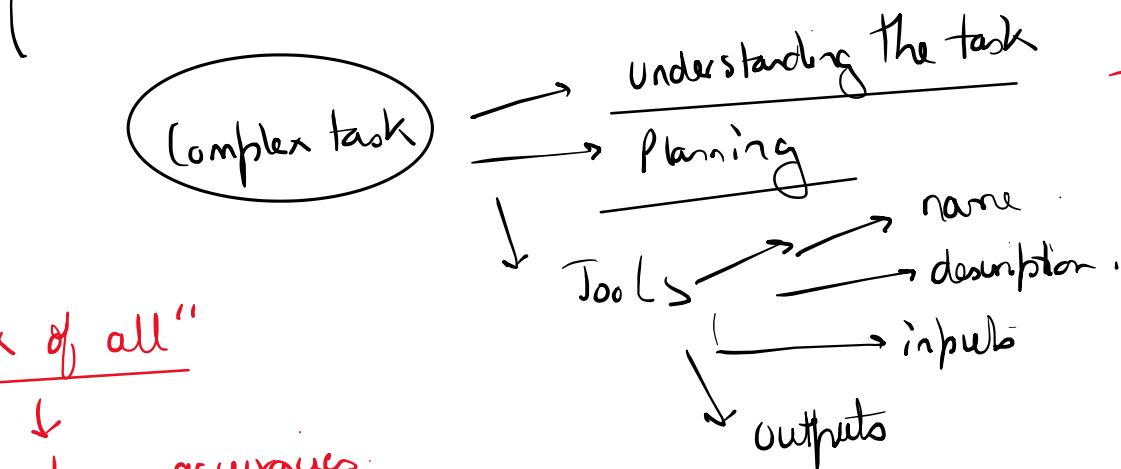
3) Crew AI → Team structure

mimic a human team





Agent → 40 diff tools -



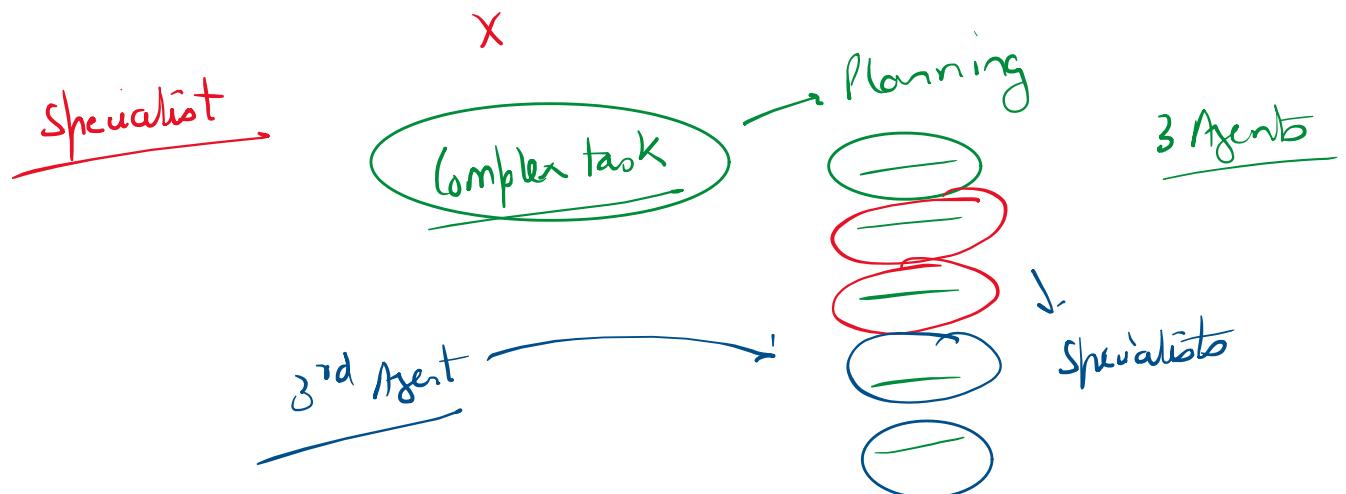
"Jack of all"

lower accuracies

Team of agents

↓

Specialists



Goal → Create a AI newsletter

- ① Research
- ② Analyze
- ③ Newsletter writing

④ Edit / Review

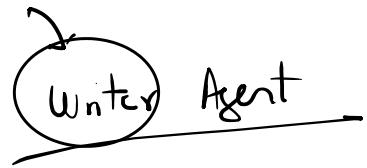
⑤ Post

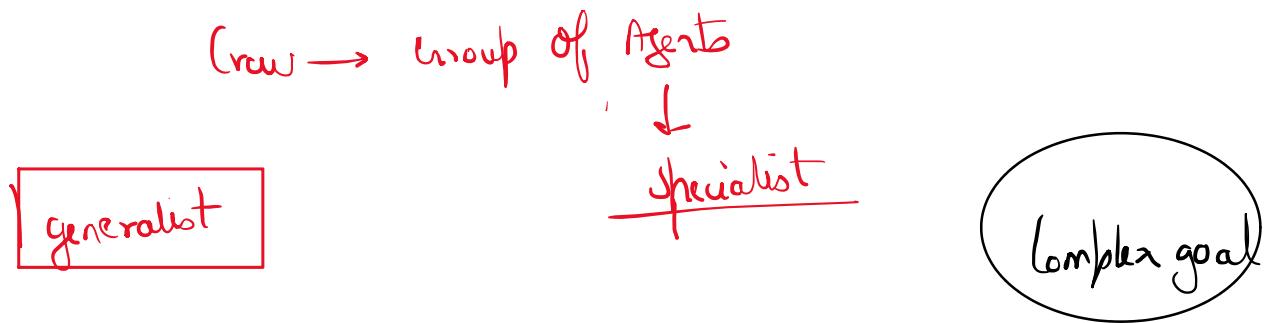
capabilities
tools

identity

...

(3) ተወስኑን ዘመን ነገር





4 components of Crew AI :-

① **Agent** → Entity which performs actions / do tasks.

↓
Specialist

{ Role : Role of agent inside crew
Goal : Goal of agent
Backstory : Persona / Unique identity
Capabilities identity
Skills -
experiences

Role : **Writer**

Goal : To write newsletter.

Backstory : Real world backstory

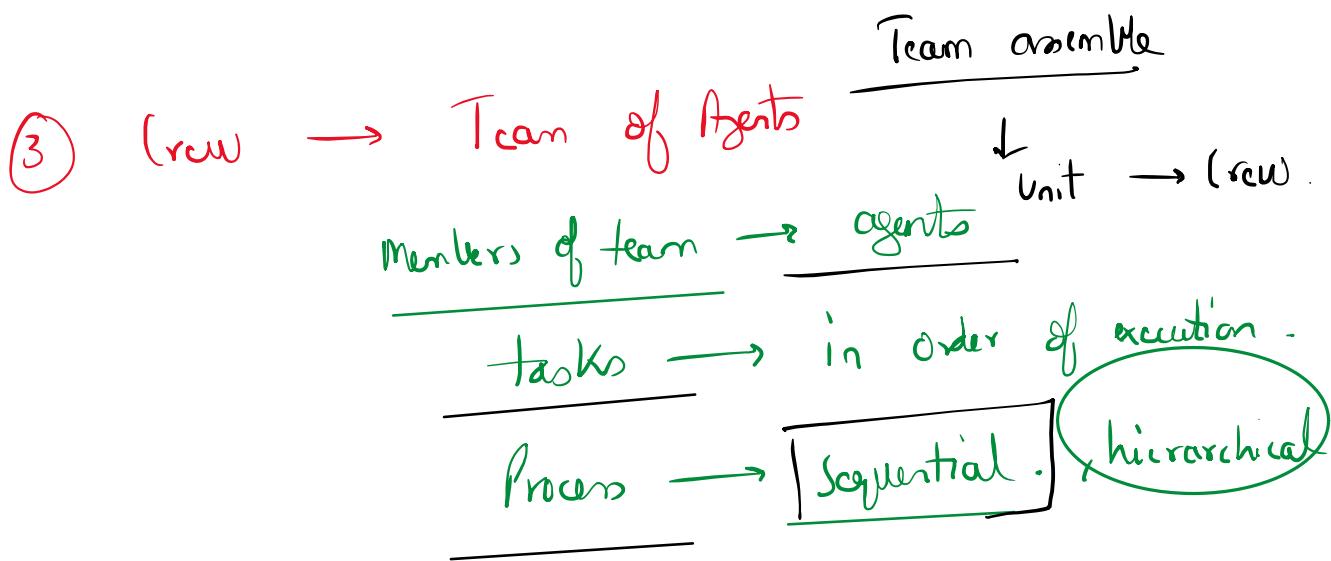
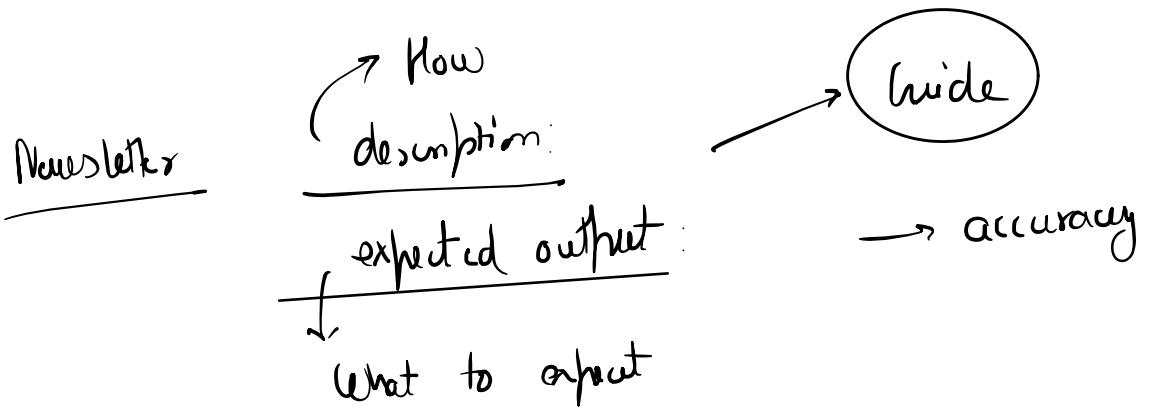
② Tasks → Entity given to the agent to perform action.

Description : What to achieve and the series of steps

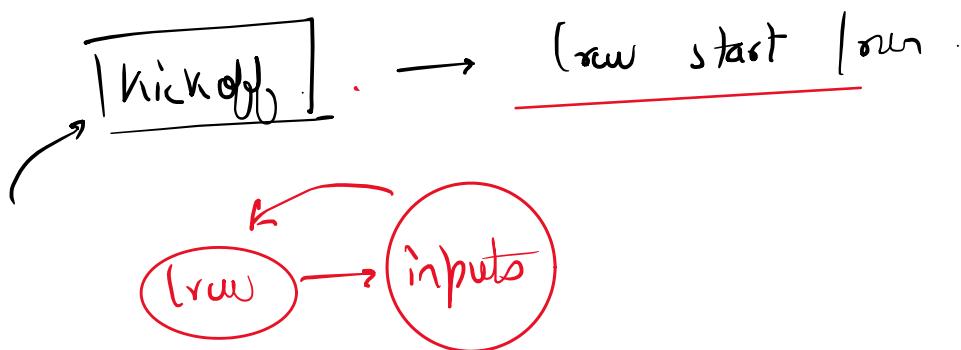
Expected output : What the output of task look like

Agent : Name of the agent which will

Agent : Name of the agent which will perform this task.



④ Execute the crew / run the crew.



multi-agent system → Output

Installation

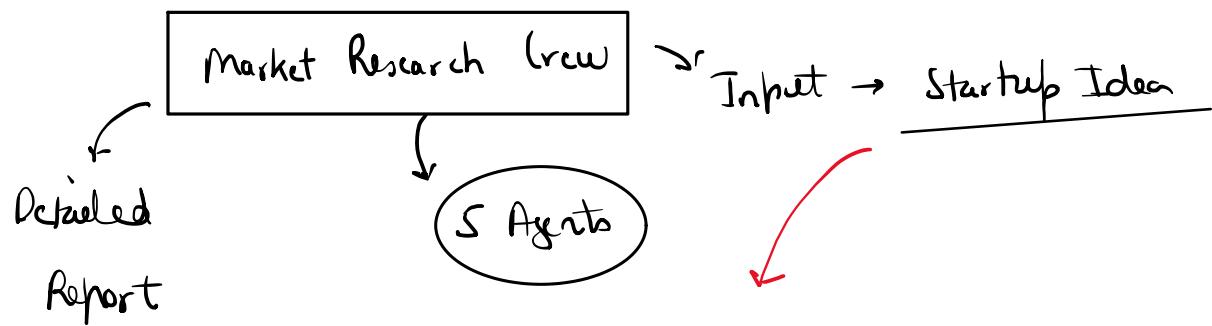
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Creating your first crew Research Report --> Blog Generation Crew

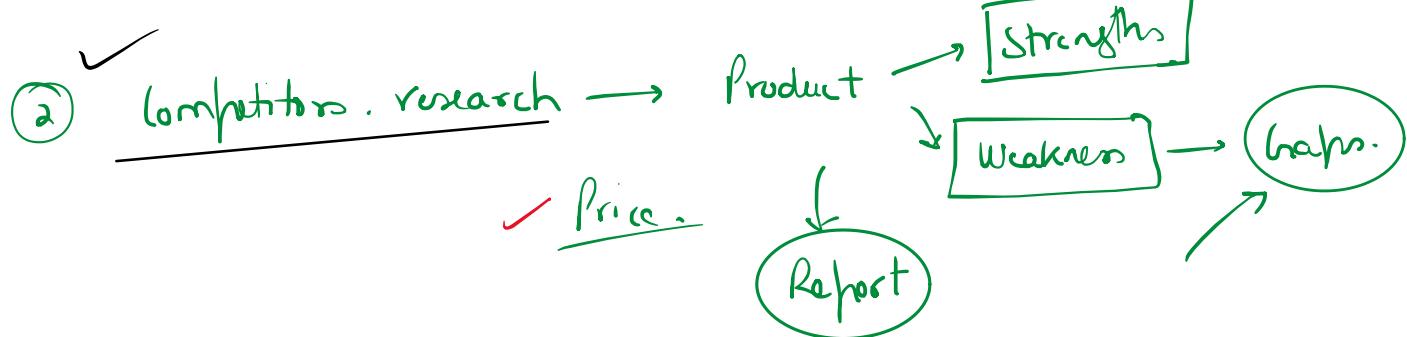
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Project

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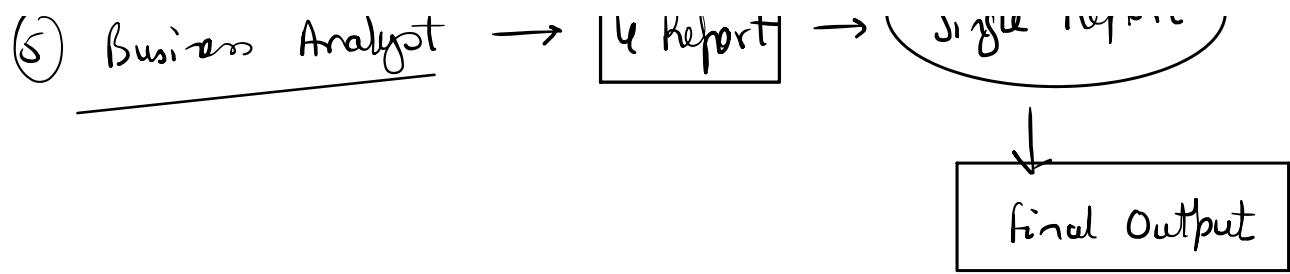
① Market research analyst → Viable, gaps, growth trends
✓
(detailed report)



③ Customer Research → Customer segmentation,
Needs, Requirements, gaps
✓
Report

④ Product Features → Product, price point,
Report

⑤ Business Analyst → 4 Report → Single Report



Every downstream task → all the upstream reports

```
graph TD; USReports[all the upstream reports] --> Content[Content]
```

The text "Every downstream task → all the upstream reports" is written above a diagram. The diagram shows a box labeled "Content" with an arrow pointing down to it from a box labeled "all the upstream reports".