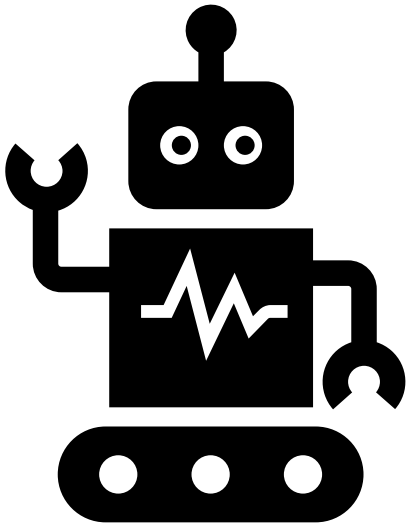
CCLS LLM Workshop – Agents Section

What is an AI Agent?

- **Key Features:**
- Has a goal or objective
- Can take actions
- May interact with users or other systems
- Uses reasoning to plan steps

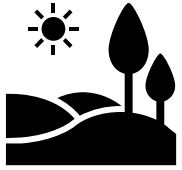
An AGENT is an autonomous or semi-autonomous system that perceives its environment and takes actions to achieve goals.



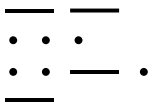
Agent Setup

Tools

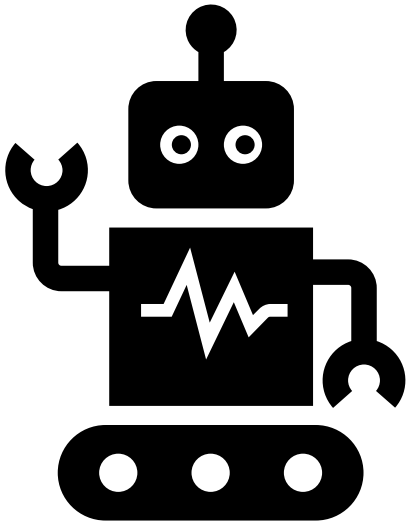
Environment



Output



Agent



Memory

Knowledge

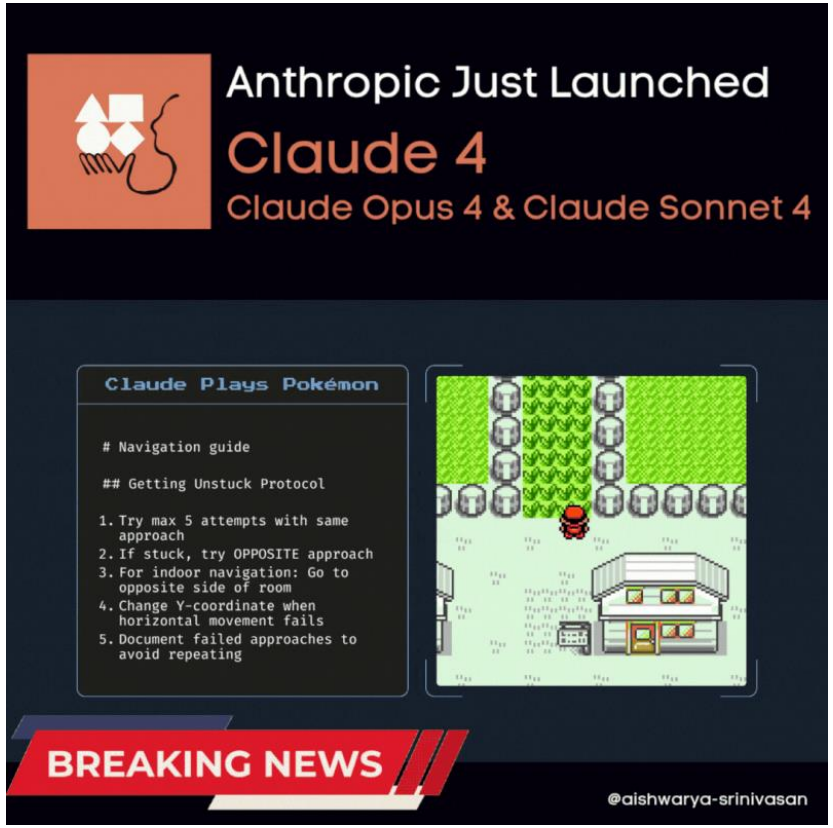
Fine Tuning

Our Example:

Claude

plays

Pokémon



Tools

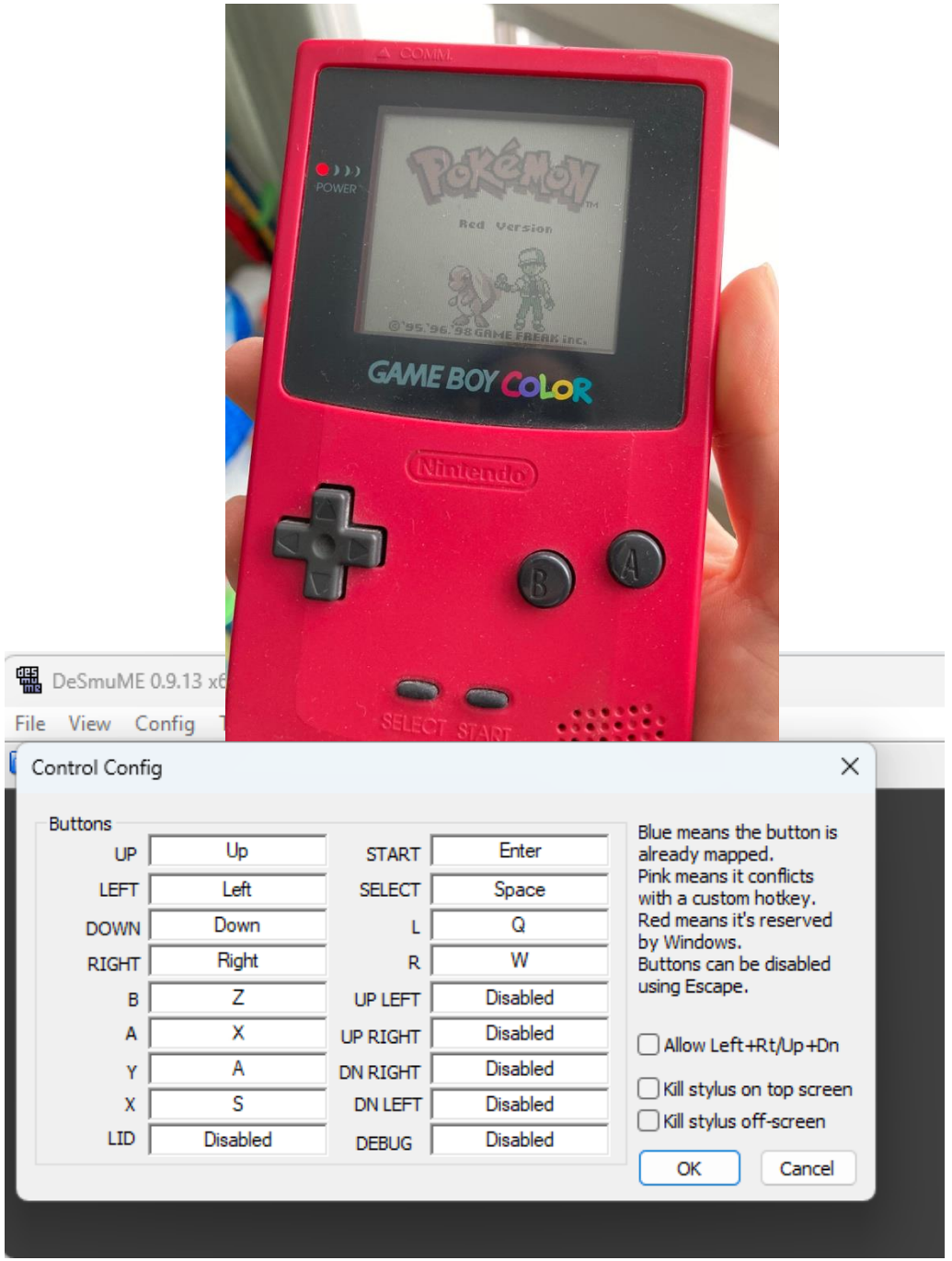
What are ⚒?

Definition:

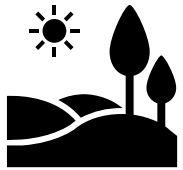
- *Tools* are external functions, APIs, or systems the agent can call to perform specific tasks it can't handle natively.

Examples:

- A Python code execution tool for statistical analysis
- A medical database query tool
- A plotting library (e.g., matplotlib) to visualize trends



Environment

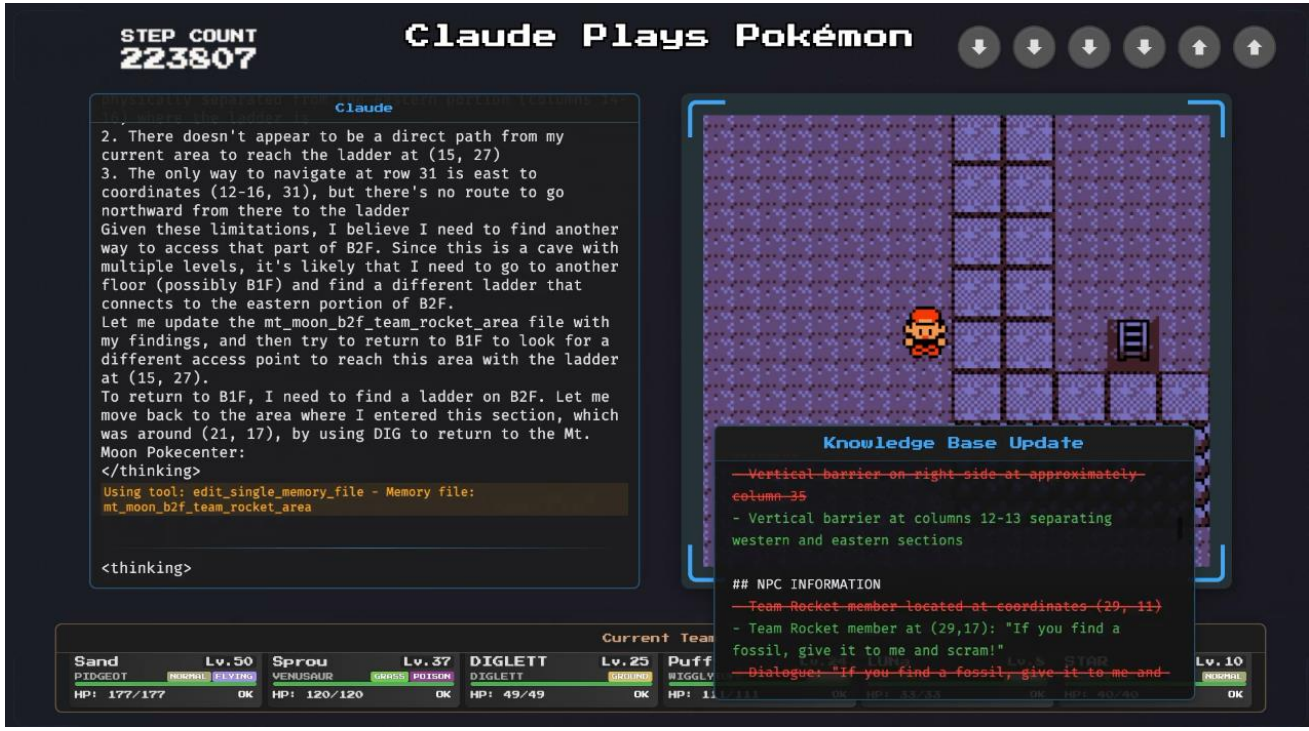
What is the  ?

Definition:

- The *environment* is everything external that the agent perceives and interacts with. It includes users, datasets, APIs, file systems, and tools.

Course Example:

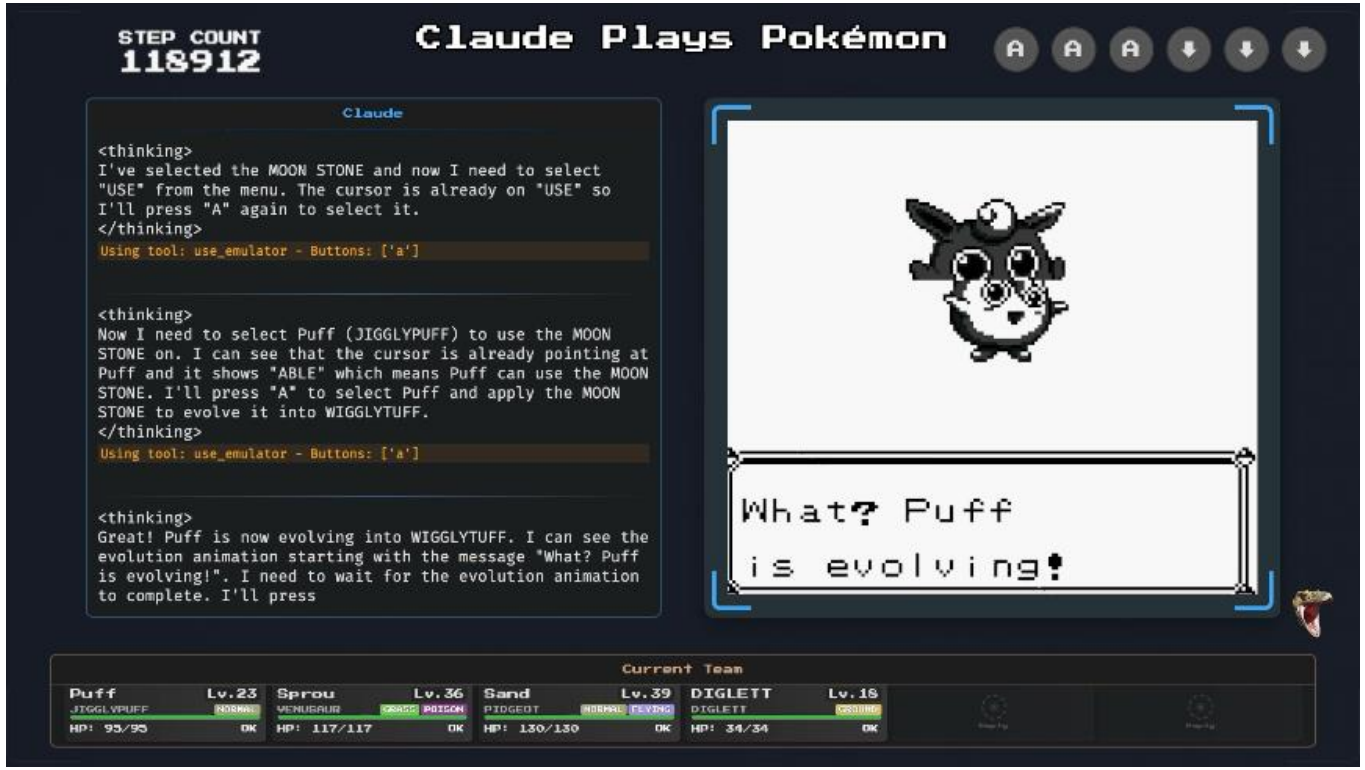
- **Environment:** Kaggle dataset, notebooks, plotting libraries, external clinical databases
- **Agent Actions:** Reads CSV files, generates plots, writes summaries, recommends features



What is the Output ?

Types of Output:

- **Text:** Descriptive analysis or summaries
- **Code:** Python scripts to process data
- **JSON:** Structured data outputs for pipelines or APIs
- **Plots:** Visual output like bar charts or survival curves

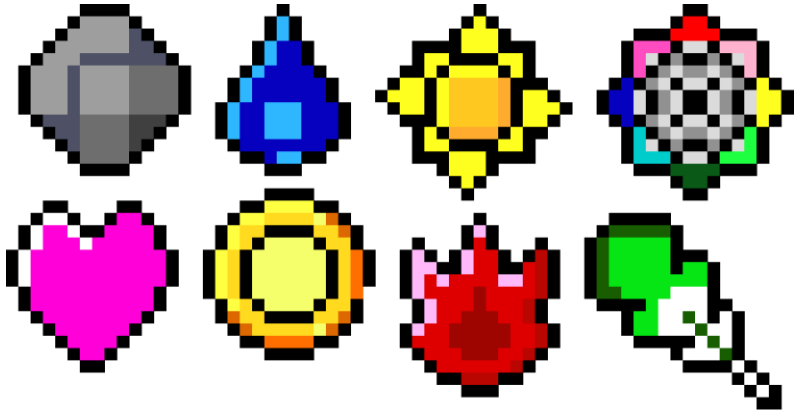


What is Memory ?

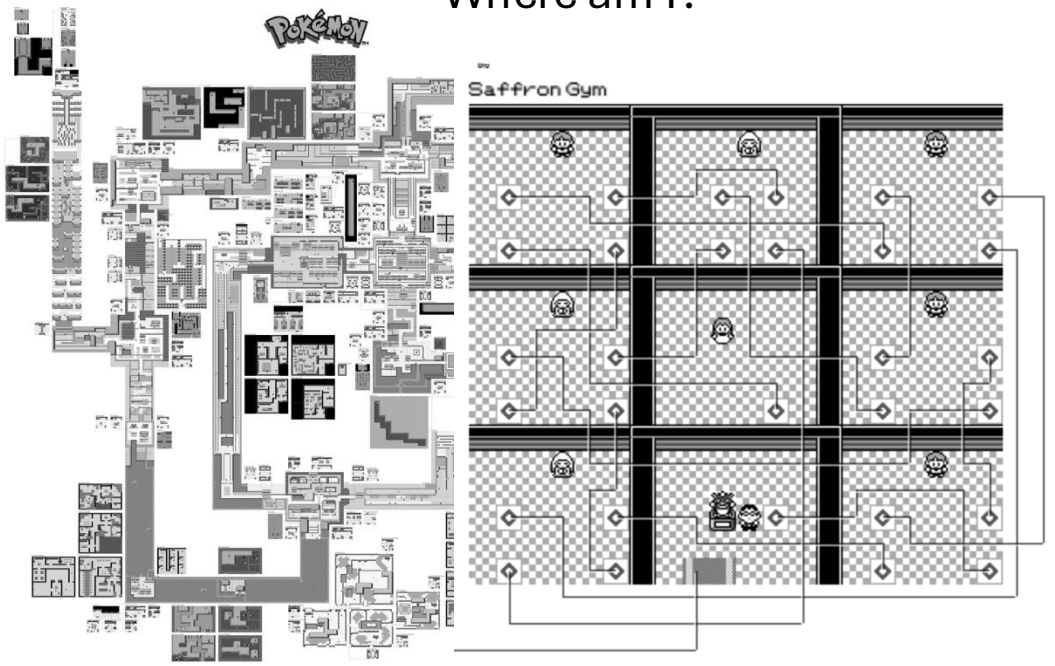
- **Definition:**
- *Memory* allows an agent to remember past interactions, decisions, and user inputs across sessions or within a workflow.

- **Types:**
- **Short-Term Memory:** Within a single task
- **Long-Term Memory:** Stored between sessions (e.g., previous patient cases)

How far did I progress?



Where am I?



Knowledge

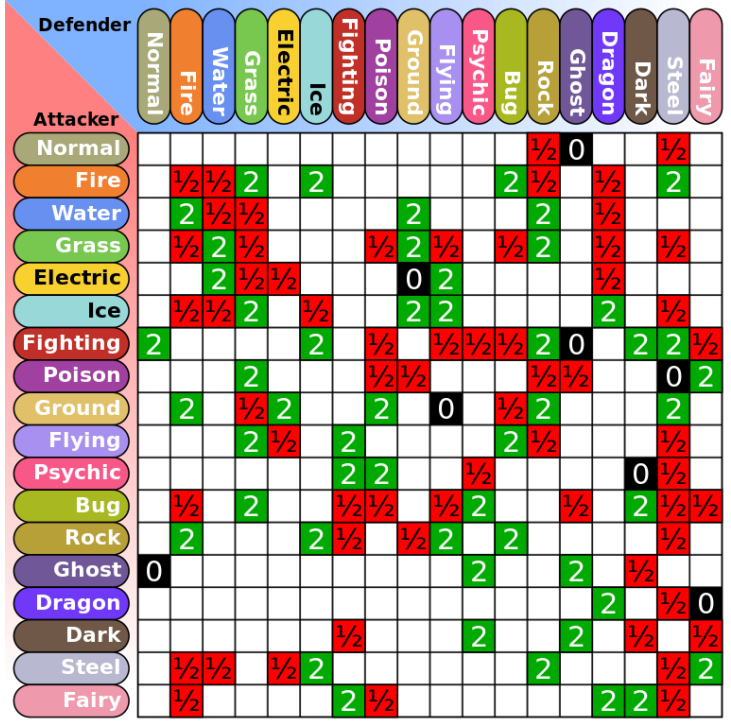
What is ?

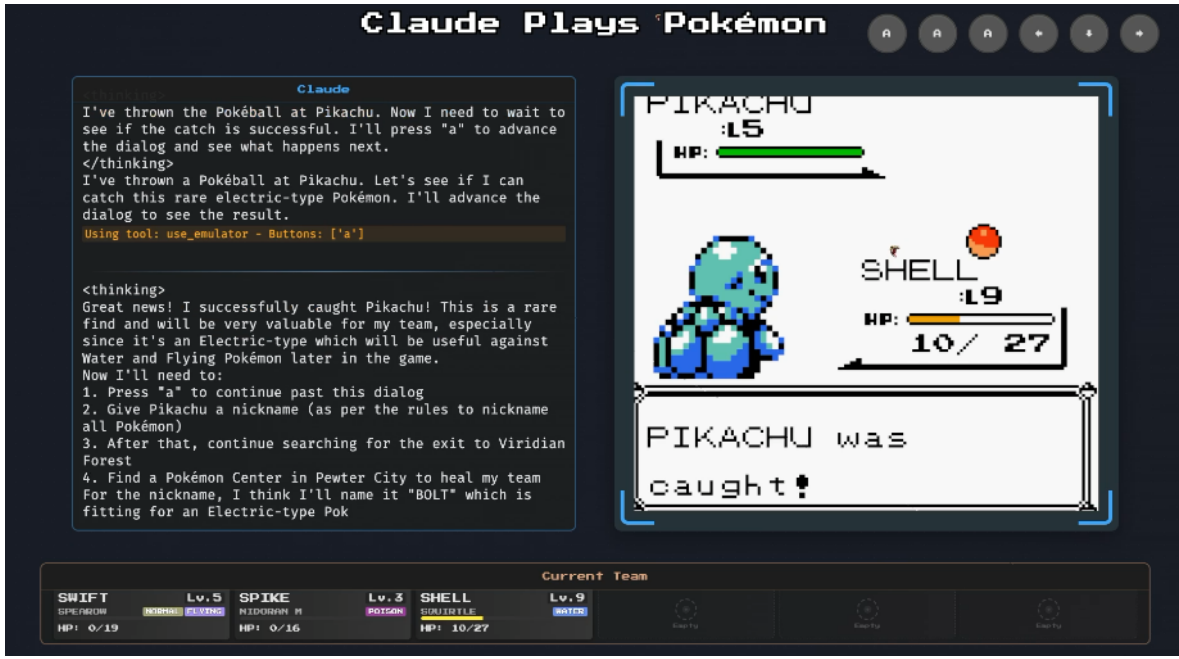
Definition:

- *Knowledge* is the information the agent is initialized or trained with—either hardcoded facts or embedded in model weights.

Forms:

- **Static:** Embedded in the model (e.g., general medical knowledge)
- **Dynamic:** Retrieved or updated via tools or databases



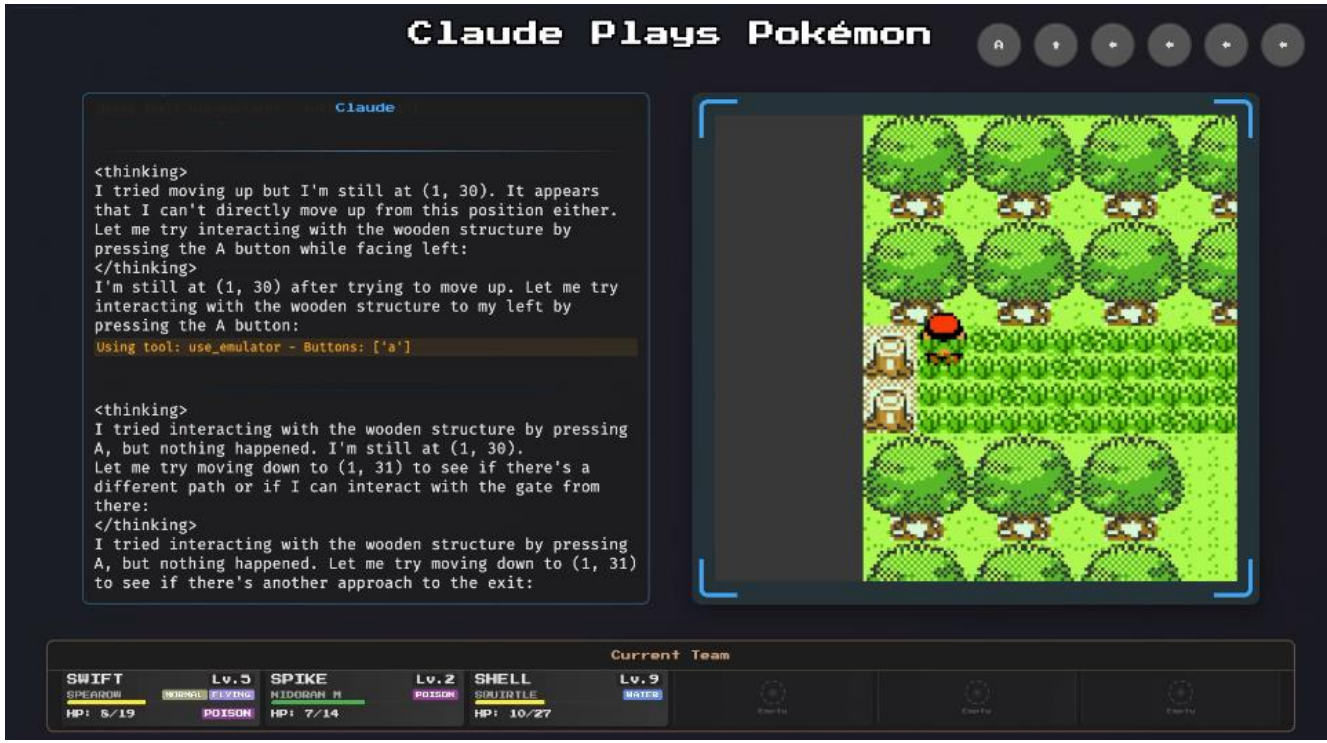


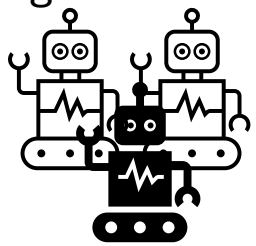
Fine Tuning

What is “Ψ” ?

- **Definition:**
- *Fine-tuning* is the process of training an LLM on a specific dataset to specialize it for a task or domain.

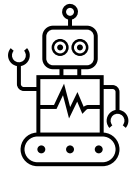
- **Use Case:**
- General LLM → Fine-tuned on cardiology literature → Expert medical agent

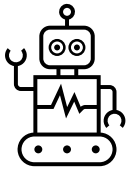


What is an Agent Teams  ?

Definition:

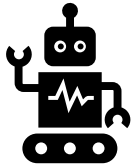
- *Agent teams* are multiple agents that work together each with specialized roles to solve complex tasks through collaboration and communication.

Battle Agent 

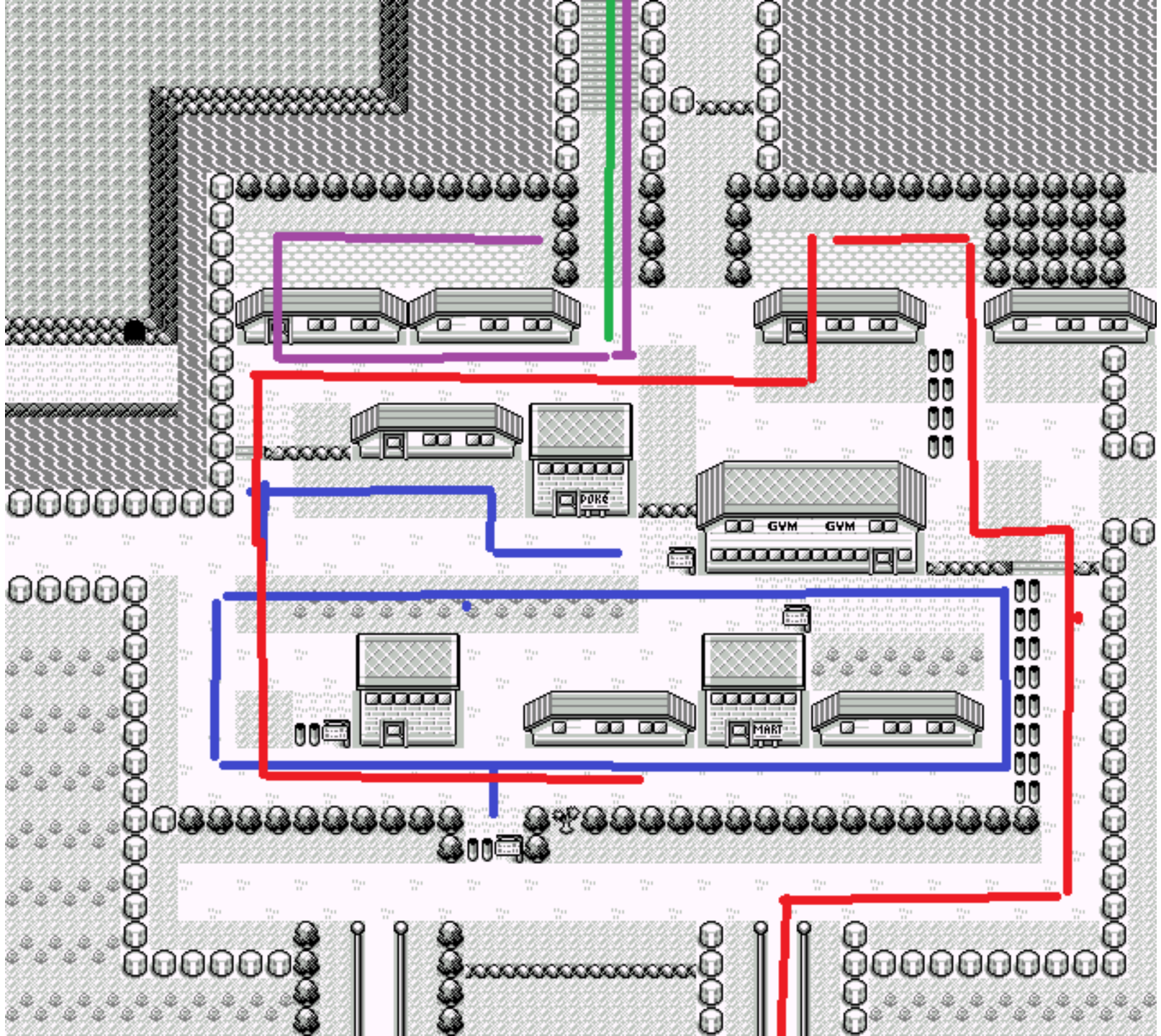
Screenshot analyzer 

Key Properties:

- **Division of labor:** Each agent handles a subtask (e.g., data cleaning, modeling, interpretation)
- **Communication:** Agents share intermediate outputs or decisions
- **Coordination:** Tasks are sequenced or parallelized for efficiency

Movement Agent 

Thanks for listening!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