Claude Builder Club Agentic Masterclass 1

@Penn

October 17, 2025

Check-in for attendance!
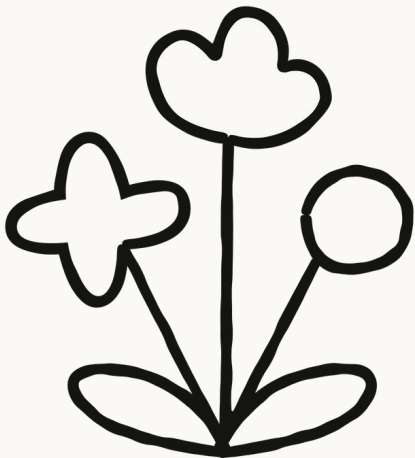
Introductions

Today's Presenter

Albert Opher
CBA | CIS + FNCE '25

What are Agents?

MOVING BEYOND SIMPLE CHATBOTS

Traditional AI:

- You ask → AI answers → Done

AI Agents:

- You ask → AI plans → AI acts → AI checks → AI iterates → Done

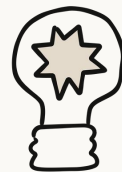**Key Difference:** Agents can take actions, use tools, and work autonomously toward goals

Real-World Examples:

- Research assistant that searches, reads, synthesizes, and writes reports
- Code reviewer that analyzes files, runs tests, identifies issues, and suggests fixes
- Personal assistant that manages email, schedules, and project tracking

The Four Pillars of AI Agents

What Makes an Agent Work?

1. Planning & Reasoning Breaking complex tasks into steps, making decisions
2. Tool Use Accessing external capabilities (search, calculators, APIs, file systems)
3. Memory Tracking conversation history, project context, and learned preferences
4. Execution Loop Acting → Observing results → Adjusting approach → Repeating

Think of it like: Brain + Hands + Notebook + Persistence

IBM 5 Pillars to Agentic Governance Video:
https://www.youtube.com/watch?v=5hK7pQsvpy0

Real Applications Across Industries

Software Development:

- Claude Code, GitHub Copilot Workspace, Devin

Research & Analysis:

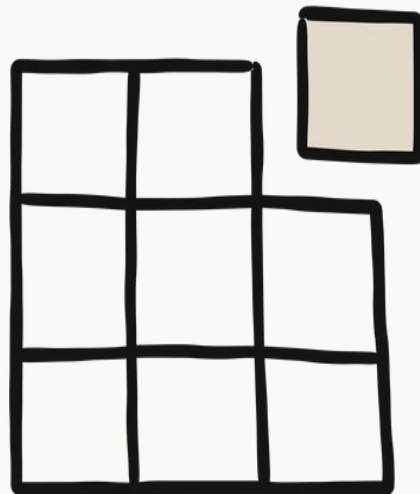- Perplexity Pro, Elicit, Research Rabbit

Business Operations:

- Customer service bots, data analysis tools, workflow automation

Creative Work:

- Content generation, image creation workflows, video editing assistants

Personal Productivity:

- Email management, scheduling, task prioritization

Claude Agentic Prompting Guide (1)

Core Prompting Techniques:

- [Prompt Improver](#) - Optimize and refine prompts for better performance
- [Prompt Templates & Variables](#) - Create reusable, dynamic prompts
- [System Prompts](#) - Define agent behavior and constraints

Agent Architecture:

- Chain-of-thought reasoning patterns, multi-step task decomposition
- Role definition and persona design for specialized agents
- Goal specification and success criteria

Tool Use & Function Calling:

- Tool description best practices, parameter specification
- Multi-tool orchestration and sequential tool use
- Error recovery and fallback strategies

Claude Agentic Prompting Guide (2)

Context & Memory Management:

- Long-context handling techniques, information retrieval patterns
- State management across turns, conversation summarization
- Priority information placement and context window optimization

Output Control:

- Structured output formats (JSON, XML, markdown)
- Response length and detail calibration
- Citations, sources, and verification patterns

Safety & Guardrails:

- Input validation and sanitization, boundary setting
- Harmful output prevention, content filtering
- Audit trails and logging for agent actions

Claude Agent Role Delineation (Console):

```
main.py
1   import anthropic
2   client = anthropic.Anthropic()
3   response = client.messages.create(
4       model="claude-3-7-sonnet-20250219",
5       max_tokens=2048,
6       system="You are a seasoned data scientist at a Fortune 500 company.", # <-- role
7   prompt
8       messages=[
9           {"role": "user", "content": "Analyze this dataset for anomalies: <dataset>
10  {{DATASET}}</dataset>"}
        ]
    )
    print(response.content)
```

Demo

Your First Agent Workflow

Open: http://claude.ai

The Task: "Research the top 3 AI coding assistants available today, compare their features and pricing, and create a comparison table in an artifact."

What You'll See Claude Do:

1. Search for current information on AI coding tools
2. Visit multiple sources to gather data
3. Synthesize findings
4. Structure information into a table
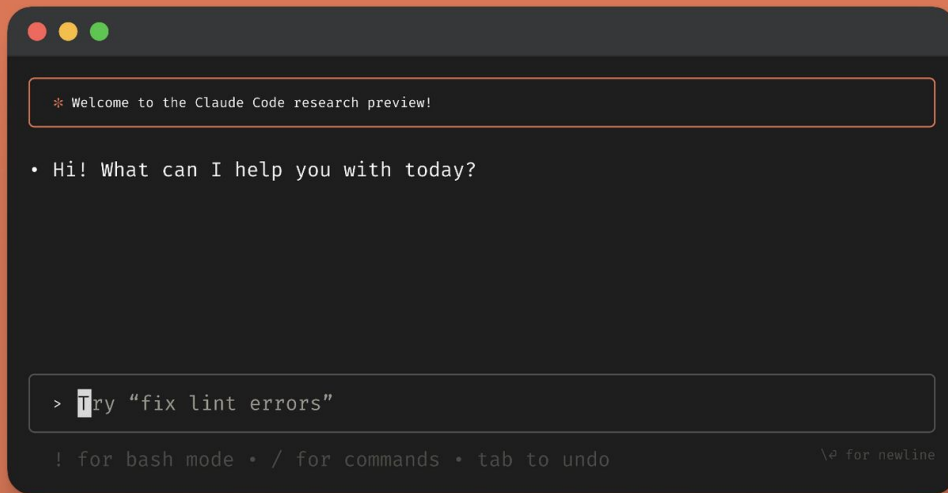5. Create an artifact with formatted results

10-Minute Hackathon

10-Minute Hackathon

What can YOU build in 10 minutes?

- Fork the github code and use claude to build a cool application!
  - https://github.com/Albinator3000/AgentsMasterclassSession1/blob/main/README.md
- Build a useful starter app using claude!
- 5 Best Presentations Get Merch!
- Must Use Claude and follow an agentic workflow!
-

SUBMIT HACKATHON PROJECTS HERE:

Hackathon Submission Link and Google Doc was Here

Micro-Agent Hackathon Winners:

YOU WIN FREE CLAUDE PRO

It's TRUE, for coming to this meeting, you have earned a free Claude Pro account.

To redeem:
- Fill out the form attached to the QR code
- Make sure you have a Claude.ai log-in that is connected to your **STUDENT EMAIL**

Note to students:
We will send out an email with your FREE Claude Pro login, this will take up to two business days!

Come to a meeting to get the QR code for Free Claude Pro

Q&A

ANTHROP\C

Thank you for coming!

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