

Agrifood

Vibe Coding Workshop

AGENDA



Intros



**Language
Calculator**



Ethics



Ecosystem



**Harnesses
and Agents**



Open Source



Agrifood Vibe Coding Workshop



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Ecosystem



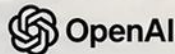
Harnesses and Agents



Open Source

Proprietary / Commercial

Closed models • API access • Managed by providers



ANTHROPIC



The AI Ecosystem

Many models.
Many providers.
One open future.

Open Source

Open weights • Self-hostable
Community driven



Llama



Mistral AI



Qwen



DeepSeek



Phi



Gemma

Specialized

Domain-specific • Multimodal
Edge and local options



Cohere



xAI



NVIDIA



Stability AI



Ollama



vLLM

A diverse ecosystem gives us choice, resilience, and the ability to build for our own needs.

What is a Token of Compute?

A token is a small piece of text used by a language model. It can be a word, part of a word, a number, or a symbol.

Goats build a better future.



Goats build a better future .

= 6 tokens



Compute

Each token requires a small amount of compute to process.



More tokens = more compute

Longer prompts and longer responses use more tokens, and therefore more compute.



Why it matters

Understanding tokens helps you estimate costs, choose the right model, and design efficient workflows — whether you're using a cloud API or running open source models locally.



Same idea as the farm: inputs matter, efficiency counts, and more isn't always better.

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Open Source

Same tools.
Real work.
Better food.

Harnesses and Agents

TURNING MODELS INTO USEFUL PARTNERS

Models are the brains.
Harnesses make them useful.
Agents do the work.

Agent Frameworks (Build and Run Agents)



Hermes

Open agent framework
for research, tools
and long-running tasks



OpenCode

Terminal-native
AI coding agents



AutoGen

Multi-agent
conversations
and tool use



CrewAI

Role-based agents
that collaborate
on complex tasks



LangGraph

Build stateful agents
with tools, memory
and control

Model Interfaces (Power the Agents)



OpenAI



Anthropic



Google
Gemini



Meta
Llama



Mistral



DeepSeek

Tools and Infrastructure (Give Agents Real-World Capabilities)



MCP

Connect tools
and data



Vector Databases

Memory
and context



APIs

Real-world
actions



Local Tools

Run on your
own infrastructure



Cloud or Local

Your choice

From Idea to Action

- 1 Choose a model (or mix)
- 2 Use a harness to give it tools
- 3 Define the agent's role and goals
- 4 Connect to your data and workflows
- 5 Run, test, and iterate

Why It Matters

- Save time on repetitive work
- Work with your own data
- Combine multiple perspectives
- Keep control and transparency
- Adapt to your needs

Curious Agents
Stronger Food Systems

Good
Agents
Better
Food

IDEAS
→
ACTIONS
↓
IMPACT

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Open Source

Same tools.
More possibilities
for a resilient food system.

Open Source for Agrifood

Proven tools. Real communities. Practical impact.

Geospatial & Mapping



QGIS

Mapping
and spatial analysis



OpenStreetMap

Maps for
everyone



OpenDroneMap

Drone imagery
to insights



GeoNode

Share and manage
spatial data

Data & Analytics



Jupyter

Interactive
analysis



Python

Data processing
and automation



PostgreSQL

Reliable
open database



Apache
Superset

Data visualization
and dashboards

Farm Management & Operations



FarmOS

Open farm
management



OpenFarm

Record keeping
and planning



ThingsBoard

IoT device
management



Node-RED

Connect devices
and automate
workflows

AI & Machine Learning



Ollama

Run AI models
locally



OpenLLM

Flexible LLM
deployment



LangChain

Build
AI agents



vLLM

High-performance
model serving

Hardware & IoT



Home Assistant

Local device
control



ESPHome

Sensors and
field monitoring



OpenAg

Open hardware
for agriculture



Arduino

Prototyping
and automation

Collaboration & Knowledge



Nextcloud

File sharing
and collaboration



Mattermost

Team
communication



BookStack

Document
knowledge



Git

Version control
for your projects

Why It Matters



Digital sovereignty

Keep your data, knowledge,
and infrastructure in your hands.



Autonomy

Run, adapt, and customize
tools to fit your needs.



Lower costs

No vendor lock-in and
more value over time.



Designed for real needs

Tools built by and for
practical communities.



Faster innovation

Learn from a global community
and build on proven solutions.



Stronger communities

Share, improve, and contribute
to a more resilient food system.

Open source doesn't mean starting from scratch.
It means standing on the shoulders of a global community to go further, together.



Tools for people
who grow a better tomorrow.

Agrifood Vibe Coding Workshop

Practical tools. Real applications. Stronger communities.

Today's Agenda

A hands-on journey from concepts to real-world possibilities.

*From ideas
to useful tools
in the real world.*

1

Recap & Overview

Where we are and where we're going.

- Quick recap of key concepts
- The agrifood opportunity
- Tools, ecosystem, and workflows
- What we'll build together



Better
tools.
Stronger
farms.

2

Software Development Principles

Build better with agents.



- Planning before coding
- Documentation and version control
- Working with agents effectively
- From small steps to reliable systems



3

The Terminal & Environments

Your workspace vs. the real world.



- Using the terminal (basic commands)
- Development vs. production environments
- Managing files, tools, and models
- Safe workflows for testing and deployment



4

Case Examples & Brainstorm

From ideas to impact.



- Real examples for farms, associations and rural communities
- Hands-on brainstorming
- Match problems to tools
- Next steps and resources



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Harnesses and Agents



Open Source

Plan
Document
Iterate
Better Systems

Plan, Document, Iterate

Agents can write code and conduct research, but good outcomes depend on how you work with them.

1 Planning

Set direction before you build.



- Define the goal and scope
- Break into small, testable steps
- Choose the right tools and models
- Anticipate data, permissions, and constraints

2 Documentation

Capture context so work is repeatable.



- Keep clear notes on goals, prompts, decisions, and results
- Document your data, tools, and setup
- Record what works (and what doesn't)
- Make it easy for you or others to pick up later

3 Revision Control

Track changes and try new ideas safely.



- Use Git (e.g., GitHub, GitLab, or local) to track changes
- Experiment in branches without breaking your main work
- Compare versions, roll back if needed
- Collaborate with agents (and people) more effectively

Plan → Build → Test → Document → Iterate

Small, steady cycles lead to better tools, deeper research, and real-world impact.



PLANNING

DOCUMENTATION

REVISION CONTROL

GOOD SYSTEMS GROW HERE

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Using a Terminal

A powerful, lightweight way to work with your computer.

```
jesse@farm:~$ ls
data  models  projects  scripts
jesse@farm:~$ cd projects
jesse@farm:~/projects$ python app.py
Starting...
```

What is a Terminal?

A text-based interface to your computer.



Fast

Do more with fewer clicks



Powerful

Control your files, tools, and workflows



Works everywhere

Same commands on Windows,
macOS, Linux



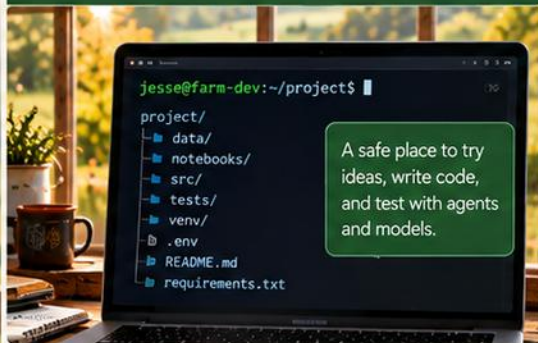
Essential for AI workflows

Run models, manage data,
and automate tasks



Development Environment

Your workshop space.
Experiment, learn, and make changes.



- ✓ Make changes freely
- ✓ Test new tools and models
- ✓ Use sample or non-sensitive data
- ✓ Break things (that's OK)
- ✓ Iterate quickly with agents
- ✓ When it works, prepare it for production



Production Environment

Your live farm.
Stable, secure, and reliable.



- ✓ Only deploy tested code
- ✓ Use real (or carefully managed) data
- ✓ Keep it stable and secure
- ✓ Monitor logs and performance
- ✓ Limit who can make changes
- 🚫 Avoid risky experiments here
- 🚫 Have a backup and rollback plan

A Simple Workflow



Open a terminal
Navigate to your
project



Work in development
Build, test, iterate



Document changes
Use Git for version
control



Deploy to production
Move only what's ready



Monitor and maintain
Keep it running smoothly

Experiment
in development.
Deliver in production.

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Open Source

Real tools.
Real problems.
Real possibilities.

What Can You Build?

From farm tools to association platforms — real examples you can adapt and extend.



Field & Land Tools

Map fields, track rotations, monitor cover crops, analyze NDVI imagery, plan grazing, and generate reports."

QGIS OpenDroneMap GeoServer PostGIS



Livestock Management

Monitor animal health and behaviour using sensors, cameras, or GPS. Track breeding, weight, movement, and pasture use.

OpenCV YOLO ESPHome InfluxDB



Environment & Resources

Track weather, soil moisture, water levels, and nutrient runoff. Get automated alerts and visualizations.

ESP32 Grafana Node-RED TimescaleDB



Market & Business Tools

Track prices, input costs, and market trends. Analyze profitability and scenario options for your operation or member farms.

Metabase Supabase n8n Python



Knowledge Assistants

Chat with your data, regulations, research papers, or manuals. Build custom assistants for members, staff, or your operation.

Llama 3 Hermes Open WebUI RAG



Member & Community Tools

Build portals for members, share resources, manage events, facilitate discussions, and connect people across regions.

Nextcloud Discourse Mastodon Drupal



Policy & Advocacy Tools

Analyze submissions, summarize key themes, map stakeholder networks, and generate briefing materials.

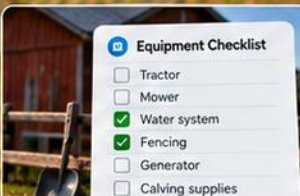
R (tidyverse) Python Ollama n8n



Supply Chain Mapping

Map and analyze local infrastructure such as processors, storage, veterinarians, and markets. Identify gaps and opportunities.

Kepler.gl PostGIS OpenStreetMap GeoServer



Operations Automation

Automate repetitive tasks, track maintenance, generate checklists, manage inventory, and create alerts and reminders.

n8n Node-RED Home Assistant Supabase



Sustainability & Reporting

Track key indicators, visualize progress, and generate reports for programs, funders, or members.

R (Shiny) Metabase Python QGIS

Ideas
Prototypes
Useful tools
Stronger communities

GOOD
TOOLS
STRONGER
FARMS

- ☑ Real problems
- ☑ Open source tools
- ☑ Build, test, share
- ☑ Make it useful