Self-Hosted AI Starter Kit - Complete Beginner's Course

🎯 Course Overview

Welcome to your journey into self-hosted AI! This course will teach you how to set up and use a complete local AI development environment using Docker, n8n, and various AI tools.

What you'll learn:

- Set up a local AI development environment
- Use n8n for building AI workflows
- Work with local language models via Ollama
- Create vector databases with Qdrant
- Build practical AI applications

Time required: 2-3 hours **Prerequisites:** Basic computer skills, willingness to learn!

📋 Pre-Flight Checklist

Before we start, let's make sure you have everything ready:

✅ System Requirements Check

- [ ] **Operating System:** Windows 10/11, macOS, or Linux
- [ ] **RAM:** At least 8GB (16GB recommended for better performance)
- [ ] **Storage:** At least 10GB free space
- [ ] **Internet:** Stable connection for downloading components

✅ Required Software Installation

Step 1: Install Docker

- **Windows/Mac:** Download Docker Desktop from docker.com
- **Linux:** Follow your distribution's Docker installation guide
- **Verification:** Open terminal/command prompt and run: `docker --version`

Step 2: Install Git

- Download from git-scm.com
- **Verification:** Run: `git --version`

Step 3: Choose Your Text Editor (Optional but helpful)

- VS Code, Sublime Text, or any editor you prefer

🏗️ Module 1: Understanding the Architecture

What is the Self-Hosted AI Starter Kit?

Think of this kit as a **pre-built AI laboratory** that runs entirely on your computer. It includes:

1. **n8n** - Your AI workflow builder (like a visual programming tool)
2. **Ollama** - Runs AI language models locally
3. **Qdrant** - Stores and searches through data intelligently
4. **PostgreSQL** - Manages your data

Why Self-Hosted?

- **Privacy:** Your data never leaves your computer
- **Cost:** No ongoing API fees
- **Control:** Customize everything to your needs
- **Learning:** Understand how AI systems work

🎯 **Quick Check:** Can you explain why someone might choose self-hosted AI over cloud services?

🚀 Module 2: Installation and Setup

Step 1: Download the Project

Open your terminal/command prompt and run:

```bash
git clone https://github.com/n8n-io/self-hosted-ai-starter-kit.git
cd self-hosted-ai-starter-kit
```

What just happened?

- `git clone` downloaded the entire project to your computer
- `cd` changed your directory into the project folder

Step 2: Choose Your Setup Profile

The kit offers different configurations based on your hardware:

🖥️ If you have an NVIDIA GPU:

```
bash

docker compose --profile gpu-nvidia up
```

🔴 If you have an AMD GPU:

```
bash

docker compose --profile gpu-amd up
```

🍎 If you're on Mac (M1 or newer):

```
bash

docker compose up
```

💻 For everyone else (CPU only):

```
bash

docker compose --profile cpu up
```

Step 3: First Launch

1. **Run your chosen command above**
2. **Wait patiently** - First time setup downloads several GB of data
3. **Look for this message:** "Editor is now accessible via: http://localhost:5678/"
4. **Open your browser** and go to: http://localhost:5678/

🎯 **Interactive Task:** Try accessing http://localhost:5678/ - what do you see?

🎨 Module 3: Your First n8n Experience

Understanding n8n

n8n (pronounced "n-eight-n") is a visual workflow builder. Think of it like connecting LEGO blocks, but each block performs a different task (sending emails, processing data, running AI models).

Initial Setup

1. **First Visit:** You'll see a setup wizard
2. **Create Account:** Set up your local admin account
3. **Skip Cloud Features:** We're staying local!

Exploring the Interface

Main Areas:

- **Canvas:** Where you build workflows (the main white area)
- **Node Panel:** Available tools/blocks on the left
- **Properties Panel:** Settings for selected nodes on the right

🎯 **Interactive Exercise:**

1. Click around the interface
2. Try dragging a node from the left panel onto the canvas
3. Delete it by selecting it and pressing Delete

🤖 Module 4: Your First AI Workflow

Pre-built Demo Workflow

The starter kit includes a demo workflow. Let's explore it:

1. **Open the demo:** http://localhost:5678/workflow/srOnR8PAY3u4RSwb
2. **Examine the nodes:** Each box represents a step in the AI process
3. **Find the Chat button** at the bottom of the canvas

Understanding the Workflow Flow

The journey of a message:

1. **Webhook** - Receives your message
2. **AI Agent** - Processes your request using Ollama
3. **Response** - Sends back the AI's answer

Testing Your First AI Interaction

1. **Click the Chat button**
2. **Type a simple question:** "What is artificial intelligence?"
3. **Send and wait** - First run might take time as it downloads the AI model

4. **Celebrate!** 🎉 You just ran local AI!

🎯 **Interactive Challenge:** Try asking the AI different types of questions:

- Factual: "What is the capital of France?"
- Creative: "Write a short poem about computers"
- Problem-solving: "How do I organize my daily tasks?"

🔧 Module 5: Building Your Own Simple Workflow

Creating a New Workflow

1. **Go to Workflows** in the left menu
2. **Click "Add Workflow"**
3. **Name it:** "My First AI Assistant"

Building a Basic AI Chat

Step 1: Add a Manual Trigger

- Drag "Manual Trigger" from the left panel
- This lets you start the workflow manually

Step 2: Add an Ollama Chat Model

- Search for "Ollama" in the node panel
- Drag "Ollama Chat Model" to the canvas
- Connect it to your Manual Trigger

Step 3: Configure Ollama

- Click on the Ollama node
- Select your model (probably "llama3.2")
- In the prompt field, type: "You are a helpful AI assistant. Answer this question: "

Step 4: Test Your Creation

- Click "Test workflow"
- Enter a question in the manual trigger
- Watch the magic happen!

🎯 **Hands-On Practice:** Create a workflow that acts as a specific type of assistant (cooking helper, study buddy, etc.)

🗂️ Module 6: Working with Data and Memory

Understanding Vector Databases

Qdrant is your AI's memory system. It helps the AI remember and find relevant information quickly.

Adding Memory to Your AI

Common Use Cases:

- Chat with your own documents
- Remember conversation history
- Search through large amounts of text

Basic Document Chat Setup

1. **Add a Qdrant node** to store documents
2. **Add a Document Loader** to read your files
3. **Connect them** to create a knowledge base

🎯 **Practice Project:** Upload a text file and create a workflow that can answer questions about its contents.

🌟 Module 7: Practical Applications

Real-World Project Ideas

Beginner Projects:

1. **Personal Assistant** - Schedule reminders, answer questions
2. **Document Summarizer** - Upload PDFs, get summaries
3. **Writing Helper** - Grammar checker, idea generator

Intermediate Projects:

1. **Smart Email Processor** - Categorize and respond to emails
2. **Research Assistant** - Gather information on topics
3. **Content Creator** - Generate social media posts

Advanced Projects:

1. **Multi-step AI Agent** - Complex problem-solving workflows
2. **Data Analysis Pipeline** - Process and analyze datasets
3. **Custom AI API** - Build your own AI service

Building Your First Practical Application

Let's create a **Personal Writing Assistant**:

1. **Create a new workflow**
2. **Add these nodes:**
   - Manual Trigger (to input text)
   - Ollama Chat Model (to improve writing)
   - Set parameters for grammar checking and style improvement
3. **Configure the prompt:**

   ```
   Please improve this text for clarity and grammar:

   {{$node["Manual Trigger"].json["text"]}}

   Provide the improved version and explain the changes made.
   ```

🎯 **Build Challenge:** Complete this writing assistant and test it with your own text!

🛠️ Module 8: Troubleshooting and Optimization

Common Issues and Solutions

Problem: "Ollama model not found" **Solution:** Wait for the model to download, or check Docker logs

Problem: "Workflow runs slowly" **Solution:** Check system resources, consider GPU acceleration

Problem: "Can't access n8n interface" **Solution:** Ensure Docker containers are running, check port 5678

Performance Tips

1. **Use GPU acceleration** if available
2. **Choose appropriate model sizes** for your hardware
3. **Monitor resource usage** in Docker Desktop
4. **Close unused workflows** to free memory

Getting Help

- **n8n Community Forum:** Great for workflow questions
- **GitHub Issues:** For technical problems
- **Documentation:** Comprehensive guides available online

🎓 Module 9: Next Steps and Advanced Topics

Expanding Your Knowledge

Immediate Next Steps:

1. **Explore n8n templates** - Import pre-built workflows
2. **Try different AI models** - Each has unique strengths
3. **Connect external services** - APIs, databases, cloud services

Advanced Learning Path:

1. **Custom node development** - Build your own n8n nodes
2. **Production deployment** - Scale your setup
3. **Integration patterns** - Connect multiple AI services

Resources for Continued Learning

Essential Bookmarks:

- n8n Documentation
- Ollama Model Library
- Qdrant Documentation
- Docker Compose Reference

Community Resources:

- n8n Community Forum
- AI/ML subreddits
- Local meetup groups

🏆 Final Assessment and Certification

Knowledge Check

True or False:

1. The starter kit requires internet connection to run AI models
2. n8n workflows can only work with text data
3. Qdrant is used for storing conversation history
4. You can connect external APIs to your n8n workflows

Practical Assessment: Create a workflow that:

1. Takes user input through a webhook
2. Processes it with an AI model
3. Stores the interaction in a database
4. Returns a formatted response

Congratulations! 🎉

You've completed the Self-Hosted AI Starter Kit course! You now have:

- ✅ A working local AI development environment
- ✅ Understanding of AI workflow creation
- ✅ Hands-on experience with modern AI tools
- ✅ Foundation for building complex AI applications

What's Next?

1. **Experiment freely** - The best learning comes from trying things
2. **Join communities** - Share your creations and learn from others
3. **Build something useful** - Apply your skills to real problems
4. **Keep learning** - AI technology evolves rapidly

📚 Quick Reference

Essential Commands

```bash
# Start the environment
docker compose --profile cpu up

# Stop the environment
docker compose down

# Update components
docker compose pull

# View logs
docker compose logs
```

Important URLs

- **n8n Interface:** http://localhost:5678/
- **Qdrant Dashboard:** http://localhost:6333/dashboard
- **PostgreSQL:** localhost:5432

Emergency Fixes

```bash
# Reset everything
docker compose down -v
docker compose up

# Free up space
docker system prune
```

Remember: The best way to learn is by doing. Don't be afraid to experiment, break things, and rebuild them. That's how you truly master these tools!

Happy AI building! 🚀