🧠 User Manual – OnChain CopyTrader AI

Built for the NYC Permissionless Hackathon on the **Supra Blockchain**, this project enables decentralized registration and copy trading of AI-based trading agents.

📦 Project Overview

Component	Purpose
AgentRegistry.sol	Register AI trading agents with metadata and performance
CopyTradeSimulator.sol	Simulate trades based on selected agents
ai_agent.py	Python script to simulate strategy (SMA crossover example)
React Frontend	UI for registering, viewing, and copying agents
Hardhat + Ethers.js	Used for deployment and interaction with the Supra EVM-compatible chain

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🔧 Prerequisites

Make sure you have the following installed:

- Node.js (v16+)
- NPM
- Hardhat
- Python 3.7+
- MetaMask with connected Supra-compatible testnet wallet
- A .env file containing your private key for deployment:

env

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PRIVATE_KEY=your_private_key_here

🚀 Smart Contract Deployment

1. Install Dependencies

bash

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npm install --save-dev hardhat @nomicfoundation/hardhat-toolbox dotenv

2. Verify Your .env

Add this in your project root:

bash

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PRIVATE_KEY=your_testnet_private_key

⚠️ Keep this secure and **never commit it to GitHub**.

3. Configure Hardhat (in hardhat.config.js)

js

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```
require("@nomicfoundation/hardhat-toolbox");
require("dotenv").config();

module.exports = {
 solidity: "0.8.19",
 networks: {
  supra: {
   url: "https://rpc.supra.com",  // Replace with the actual Supra RPC URL
   accounts: [process.env.PRIVATE_KEY]
  }
 }
};
```

4. Deploy Contracts

bash

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npx hardhat run scripts/deploy.js --network supra

You will see:

yaml

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AgentRegistry deployed at: 0x...

CopyTradeSimulator deployed at: 0x...

Copy these contract addresses for frontend integration.

🧠 Simulate AI Strategy (Python)

This simulates a **Simple Moving Average (SMA)** crossover:

1. Install Python dependencies

bash

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pip install yfinance pandas

2. Run the AI agent script

bash

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python ai_agent.py

This prints out:

scss

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Return (12M): 23.47 %

You can use this return value when registering a new AI agent in the UI.

💻 Running the Frontend (Optional)

If using the React frontend:

1. Install UI dependencies

bash

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npm install

2. Set the Contract Addresses

In App.jsx or environment config, update:

js

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const AGENT_REGISTRY_ADDRESS = "0x..."; // From deploy step

const COPY_SIMULATOR_ADDRESS = "0x...";

3. Start React App

bash

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npm start

Go to http://localhost:3000

🧪 Testing the App

You can now:

- 👷 Register new agents
- 🔎 View agent performance
- 📩 Simulate copy trading with on-chain recording

Each copy triggers:

- copyAgent() in AgentRegistry
- executeTrade() in CopyTradeSimulator

🛠️ Troubleshooting

Issue	Fix
Error: missing PRIVATE_KEY	Ensure .env file is correctly created
MetaMask can't connect	Make sure you're on the correct Supra testnet
Contract not found in frontend	Ensure deployed address is updated in React code
Python fails to fetch data	Check internet, proxy, or firewall issues blocking yfinance

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📬 Support

- 🔗 Supra Docs
- 🛠️ Extend with Supra’s oracles or block-by-block automation post-hackathon