HOW TO RUN THE PROJECT (LOCAL HARDHAT SETUP)

1) Start the Local Blockchain

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cd contracts

npx hardhat node

Keep this running - it's your local blockchain node.

2) Deploy the Smart Contracts

Open a new terminal:

cd contracts

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

Example output:

IdentityRegistry deployed to: 0x5FbDB2315678afecb367f032d93F642f64180aa3

CredentialRegistry deployed to: 0xe7f1725E7734CE288f8367e1Bb143E90bb3F0512

VerificationContract deployed to: 0xCf7Ed3AccA5a467e9e704C703E8D87F634fB0Fc9

Verifier deployed to: 0x9fE46736679d2D9a65F0992F2272dE9f3c7fa6e0

3) Update Contract Addresses

```
tee backend/contract-addresses.json <<'JSON'
{
  "IdentityRegistry": "0x5FbDB2315678afecb367f032d93F642f64180aa3",
  "CredentialRegistry": "0xe7f1725E7734CE288f8367e1Bb143E90bb3F0512",
  "VerificationContract": "0xCf7Ed3AccA5a467e9e704C703E8D87F634fB0Fc9",
  "Verifier": "0x9fE46736679d2D9a65F0992F2272dE9f3c7fa6e0"
}
JSON
```

```
cp backend/contract-addresses.json frontend/src/contract-addresses.json

mkdir -p frontend/public

cp backend/contract-addresses.json frontend/public/contract-addresses.json
```

4) Start the Backend

```
cd backend

node server.js
```

Output should show:

Server running on port 5000

Blockchain service initialized successfully

5) Start the Frontend

```
cd frontend

npm start
```

Visit http://localhost:3000

6) Configure MetaMask

Network Name: Hardhat Local

RPC URL: http://127.0.0.1:8545

Chain ID: 31337

Currency Symbol: ETH

Import the first Hardhat account private key:

0xac0974bec39a17e36ba4a6b4d238ff944bacb478cbed5efcae784d7bf4f2ff80

7) Use the DApp

- Click "Connect Wallet"

- Go to Identity -> DID Panel

- Create a DID or fetch total DIDs

Your decentralized identity system is live locally!