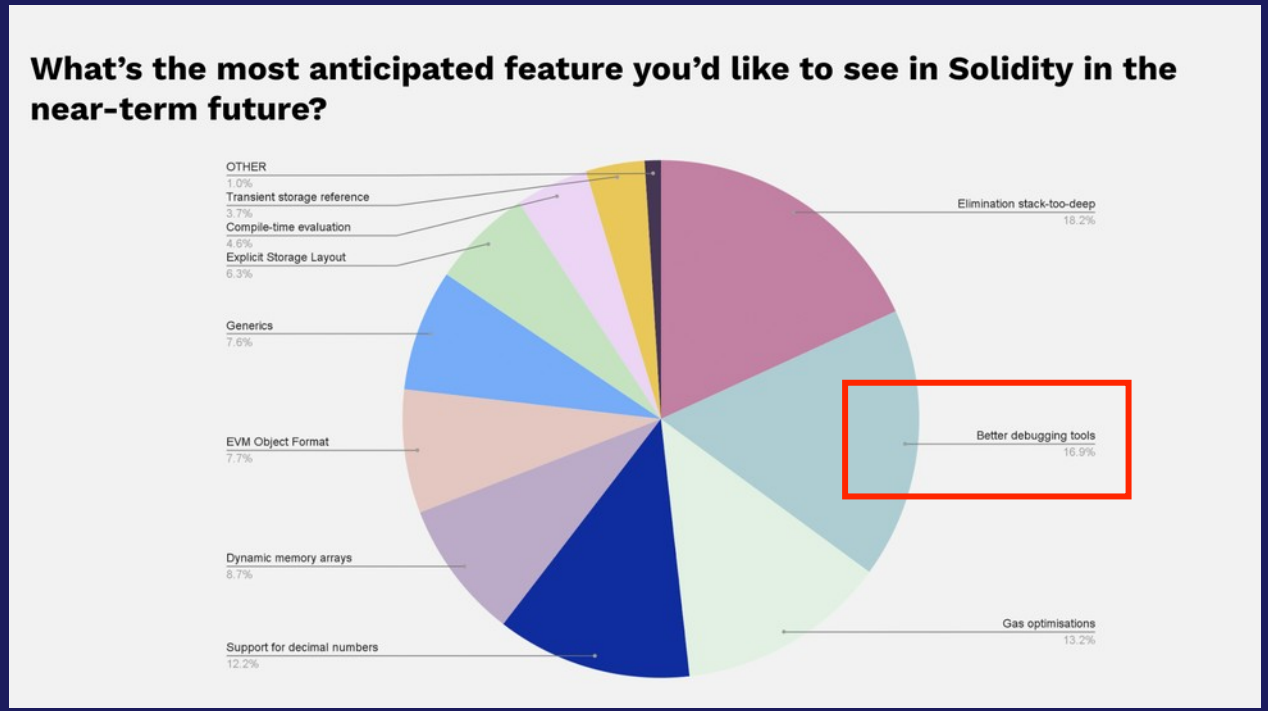
28 November 2025

debugging solidity

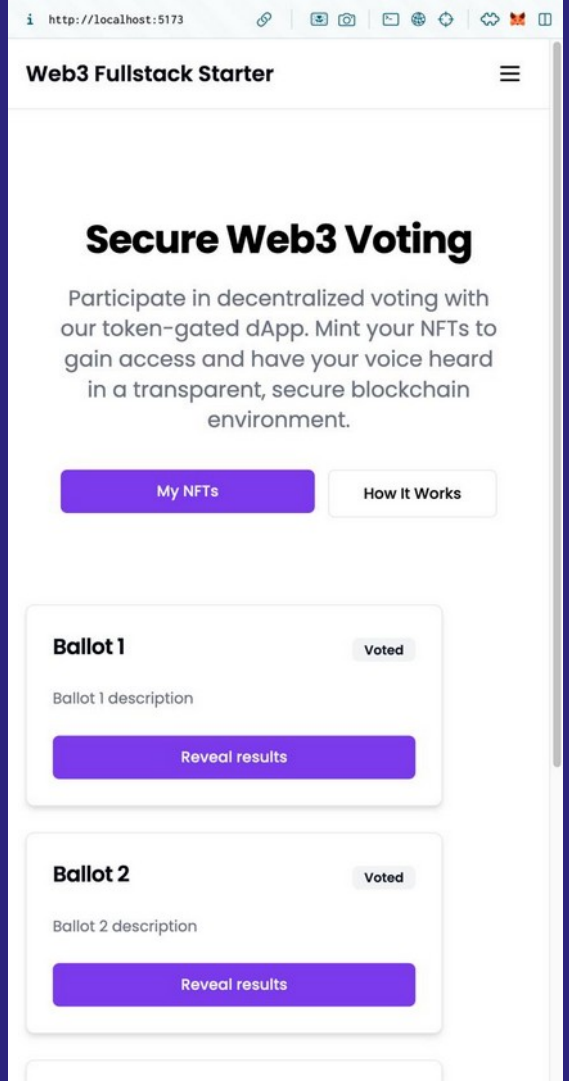
roman from walnut.dev

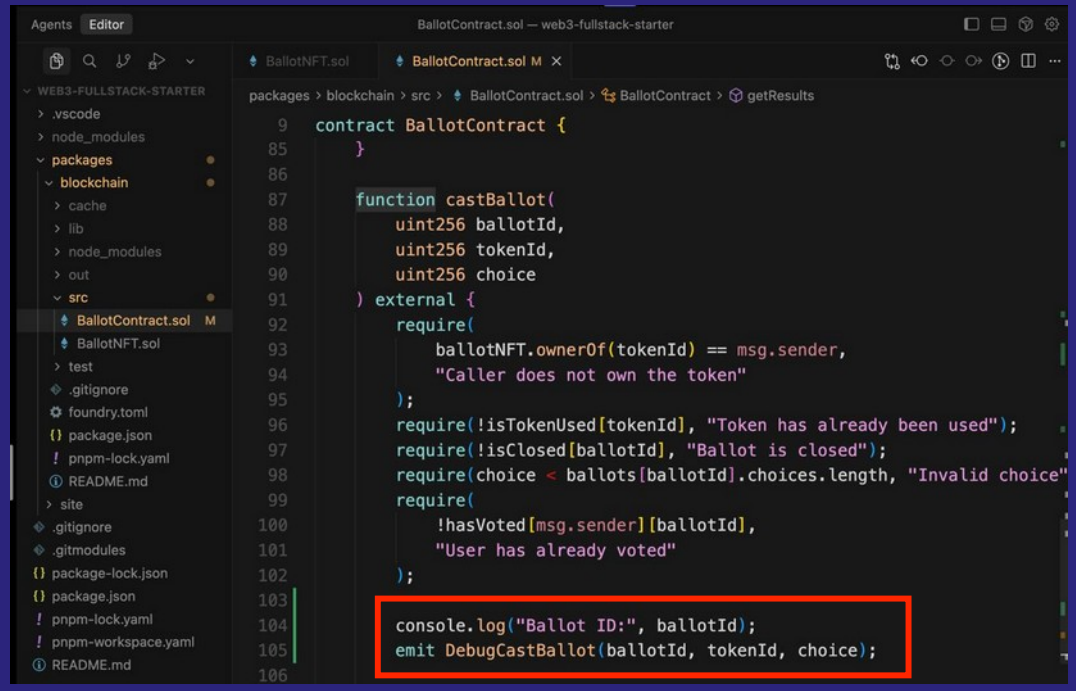


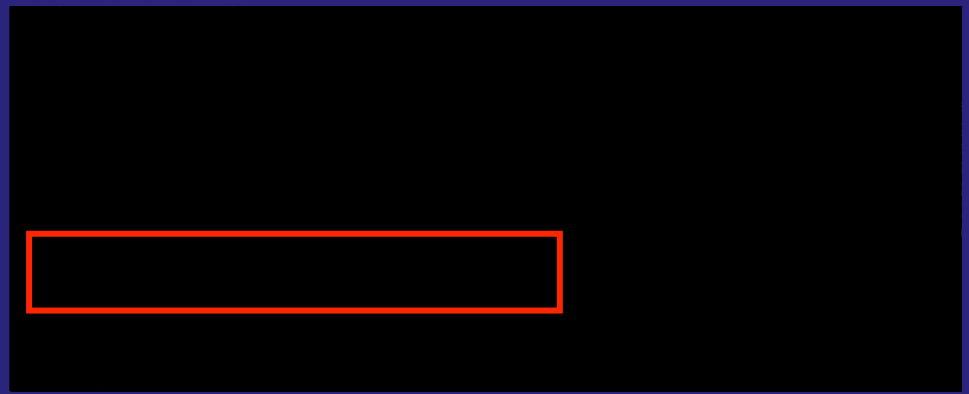
Source: https://www.soliditylang.org/blog/2025/04/25/solidity-developer-survey-2024-results/

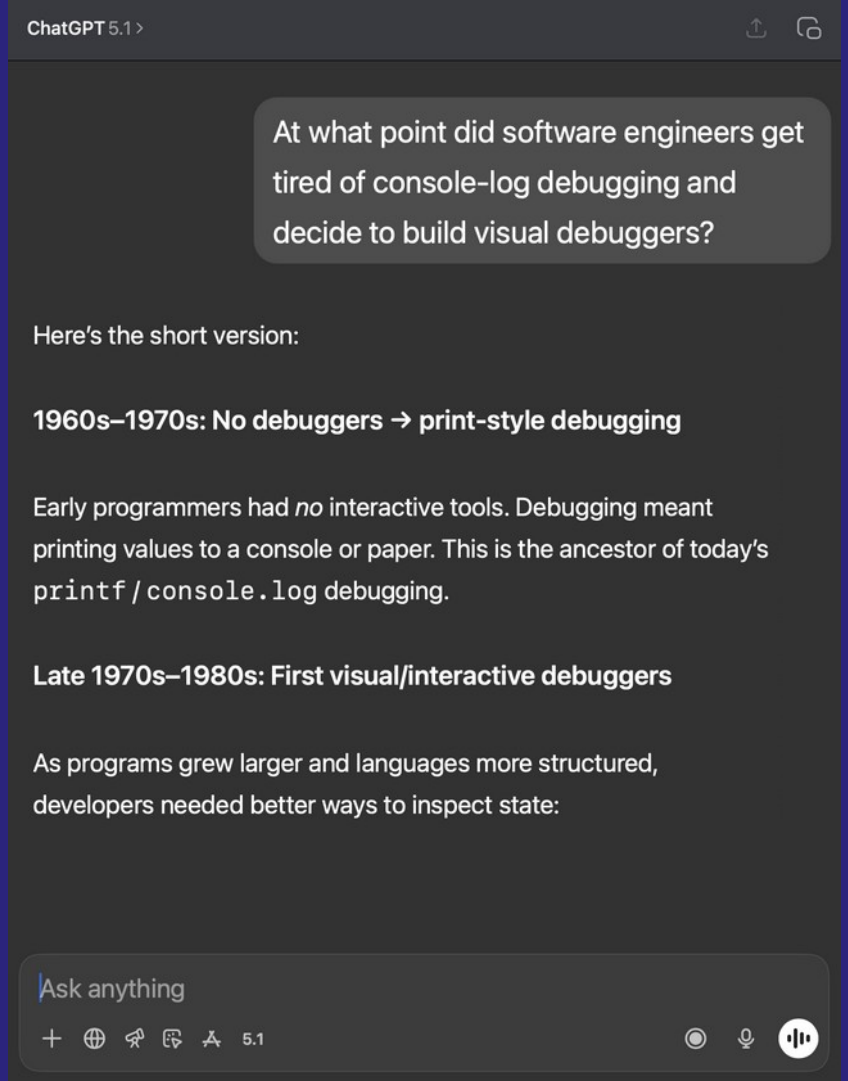
Agenda

1. Demo of the best Solidity Debugger with most amazing UX 💅
2. Challenges
3. Proposed Improvements


http://localhost:5173
Web3 Fullstack Starter
Secure Web3 Voting
Participate in decentralized voting with our token-gated dApp. Mint your NFTs to gain access and have your voice heard in a transparent, secure blockchain environment.
My NFTs
How It Works
Ballot 1
Voted
Ballot 1 description
Reveal results
Ballot 2
Voted
Ballot 2 description
Reveal results

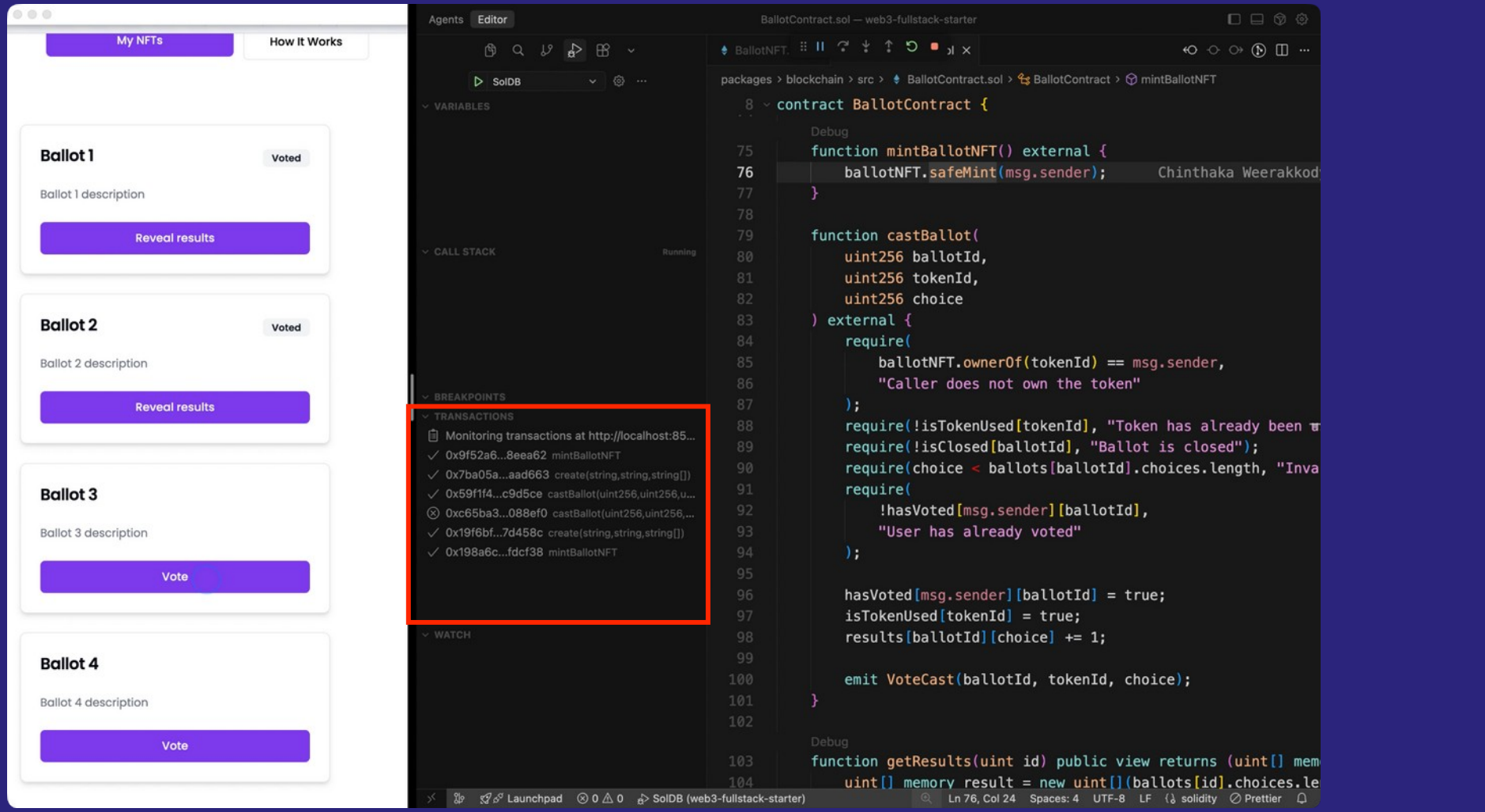

Agents
Editor
BallotContract.sol — web3-fullstack-starter
BallotNFT.sol
BallotContract.sol M
packages › blockchain › src › BallotContract.sol › BallotContract › getResults
WEB3-FULLSTACK-STARTER
.vscode
node_modules
packages
blockchain
cache
lib
node_modules
out
src
BallotContract.sol M
BallotNFT.sol
test
.gitignore
foundry.toml
package.json
pnpm-lock.yaml
README.md
site
.gitignore
.gitmodules
package-lock.json
package.json
pnpm-lock.yaml
pnpm-workspace.yaml
README.md
9 contract BallotContract {
85 }
86
87 function castBallot(
88 uint256 ballotId,
89 uint256 tokenId,
90 uint256 choice
91) external {
92 require(
93 ballotNFT.ownerOf(tokenId) == msg.sender,
94 "Caller does not own the token"
95);
96 require(!isTokenUsed[tokenId], "Token has already been used");
97 require(!isClosed[ballotId], "Ballot is closed");
98 require(choice < ballots[ballotId].choices.length, "Invalid choice"
99 require(
100 !hasVoted[msg.sender][ballotId],
101 "User has already voted"
102);
103
104 console.log("Ballot ID:", ballotId);
105 emit DebugCastBallot(ballotId, tokenId, choice);
106




ChatGPT 5.1 >
At what point did software engineers get tired of console-log debugging and decide to build visual debuggers?
Here's the short version:
1960s–1970s: No debuggers → print-style debugging
Early programmers had no interactive tools. Debugging meant printing values to a console or paper. This is the ancestor of today's printf / console.log debugging.
Late 1970s–1980s: First visual/interactive debuggers
As programs grew larger and languages more structured, developers needed better ways to inspect state:
Ask anything
5.1

Demo:

The best Solidity Debugger with most amazing UX 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SolDB
VARIABLES
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BREAKPOINTS
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}
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uint256 tokenId,
uint256 choice
) external {
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require(
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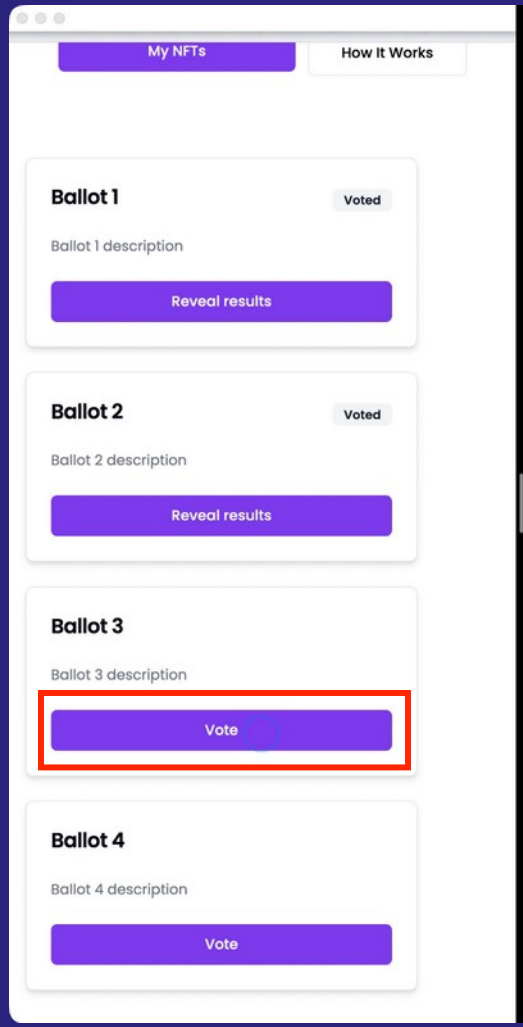
hasVoted[msg.sender][ballotId] = true;
isTokenUsed[tokenId] = true;
results[ballotId][choice] += 1;
emit VoteCast(ballotId, tokenId, choice);
}
Debug
function getResults(uint id) public view returns (uint[] mem
uint[] memory result = new uint[](ballots[id].choices.le
Launchpad
SolDB (web3-fullstack-starter)
Ln 76, Col 24
Spaces: 4
UTF-8
LF
solidity
Prettier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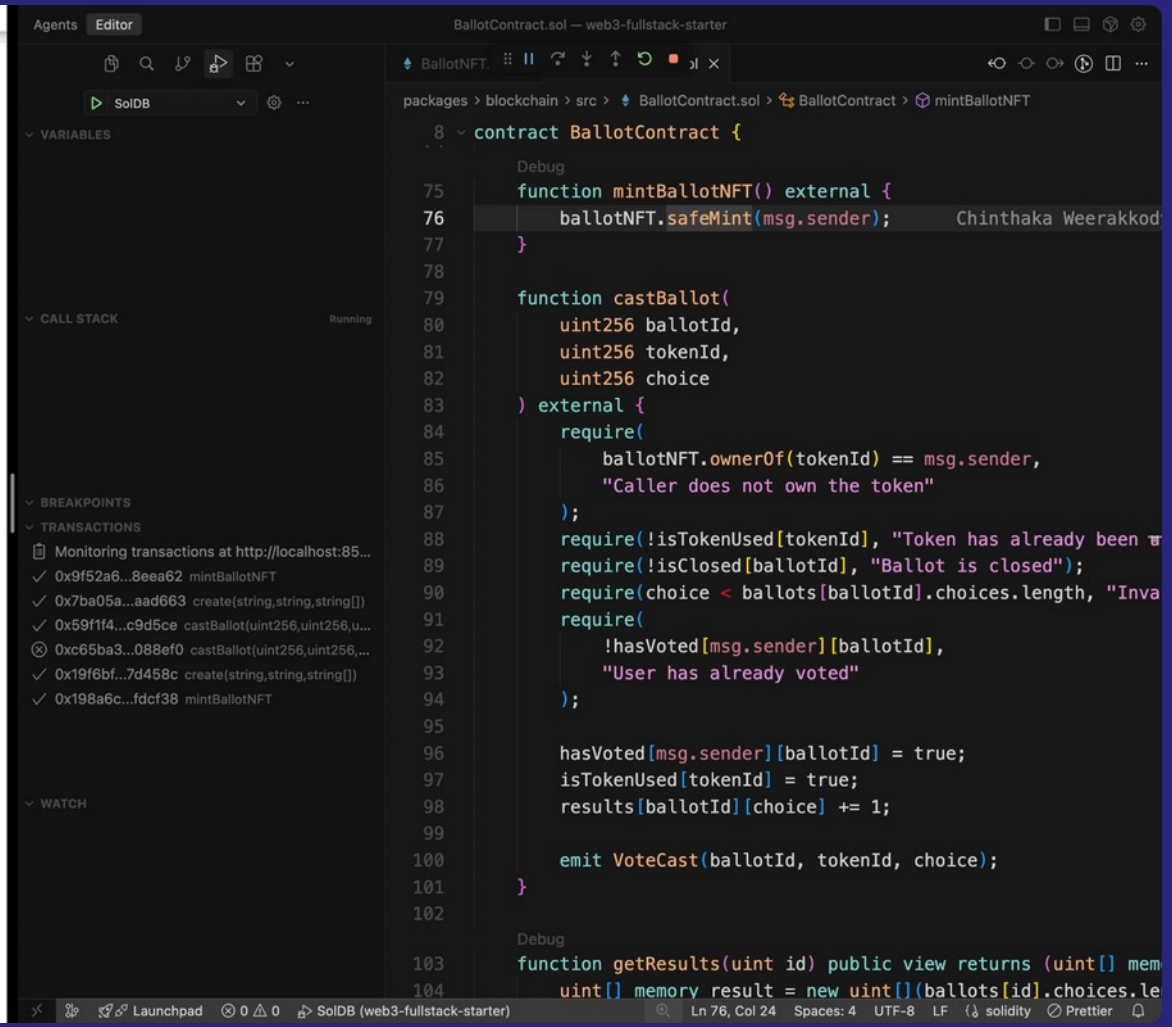
Ballot 4 description
Vote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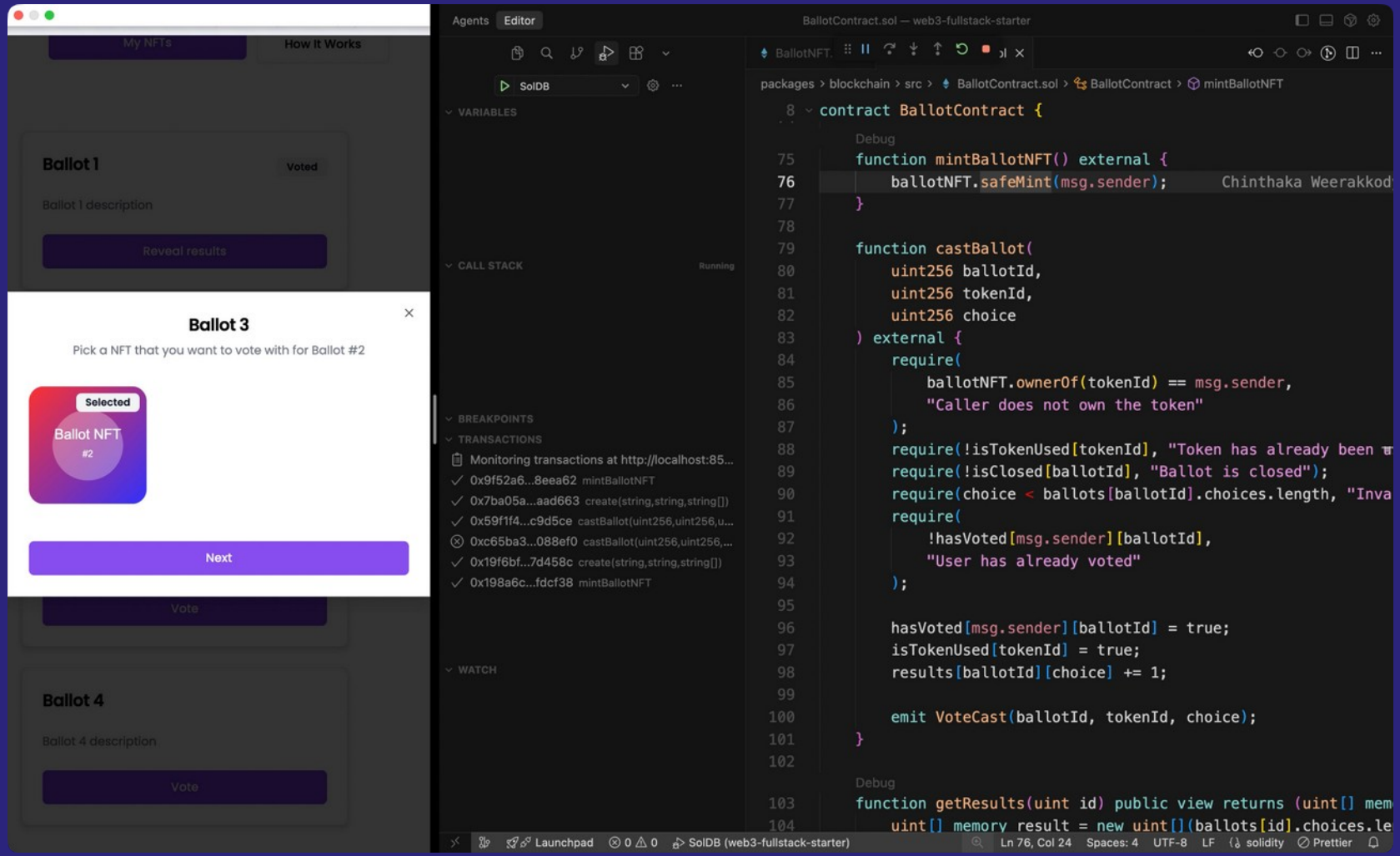
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Chinthaka Weerakkod
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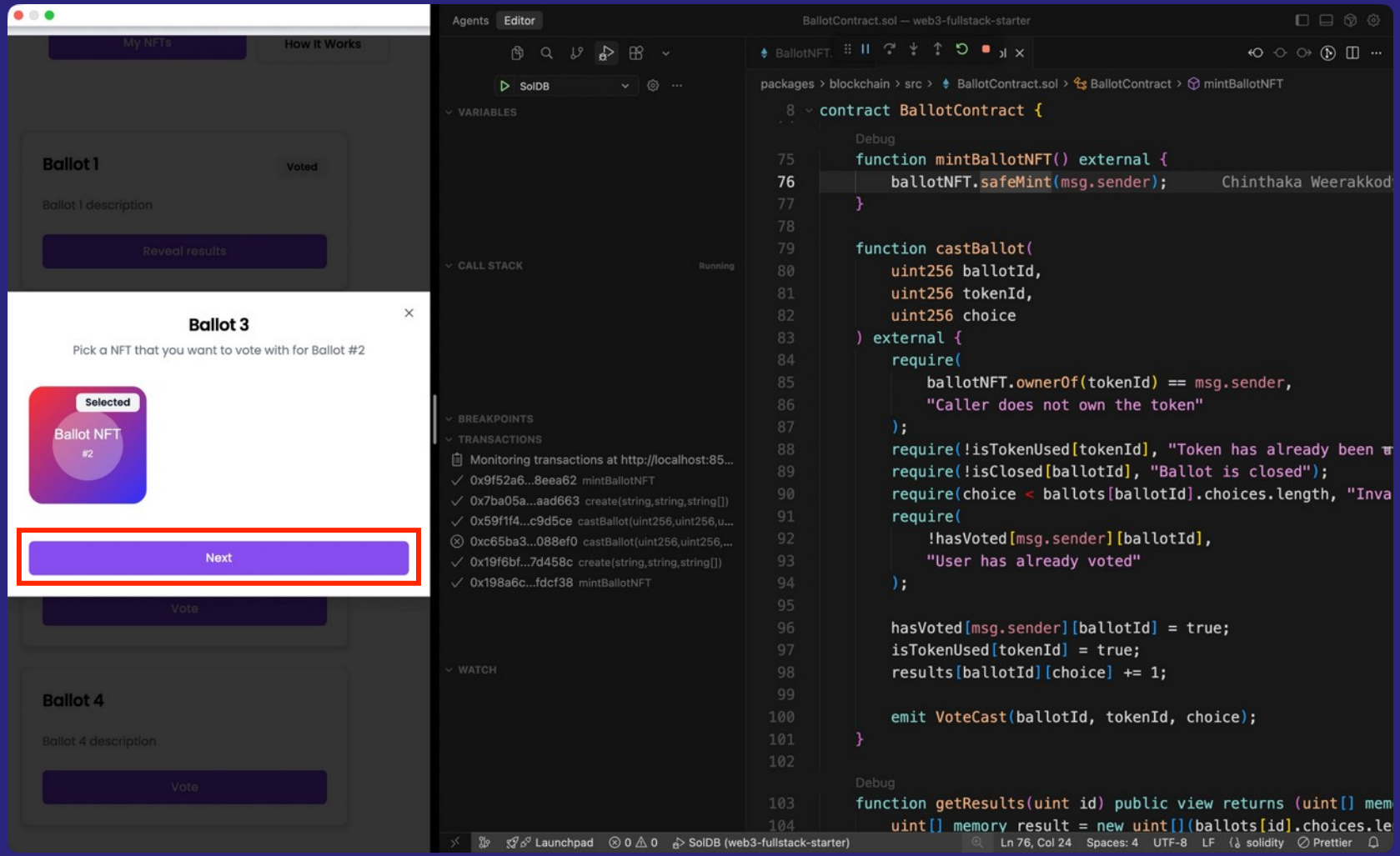
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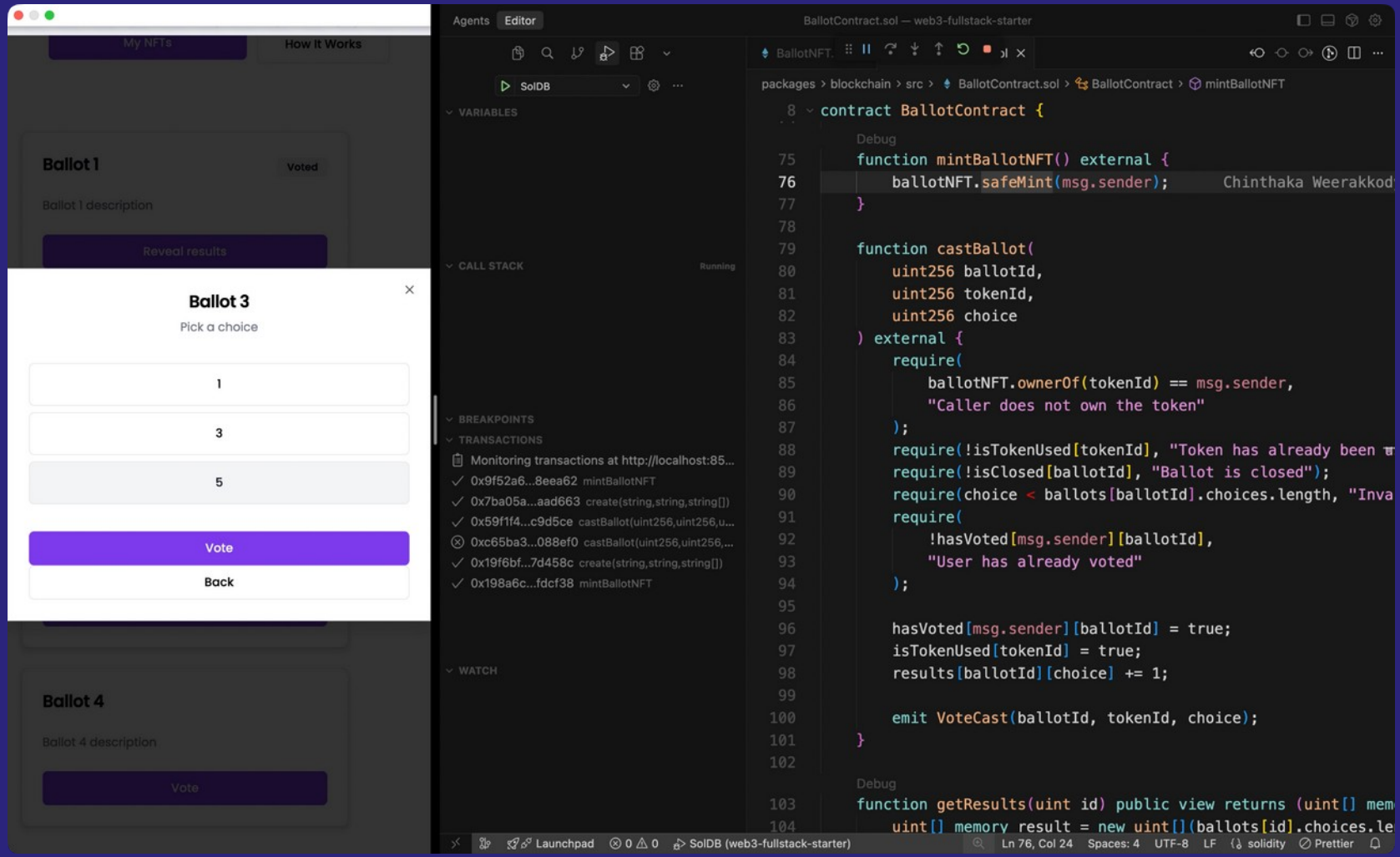
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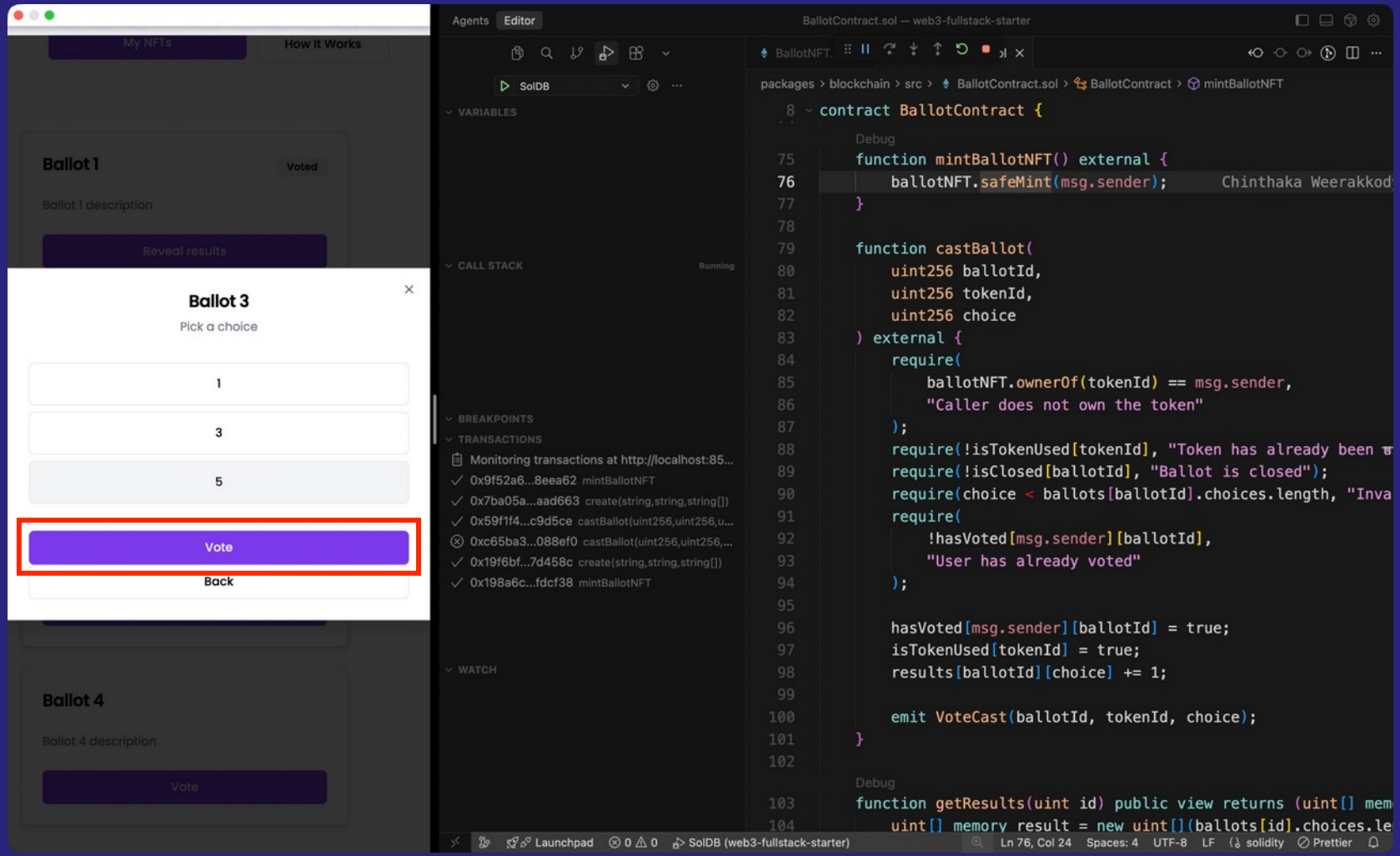
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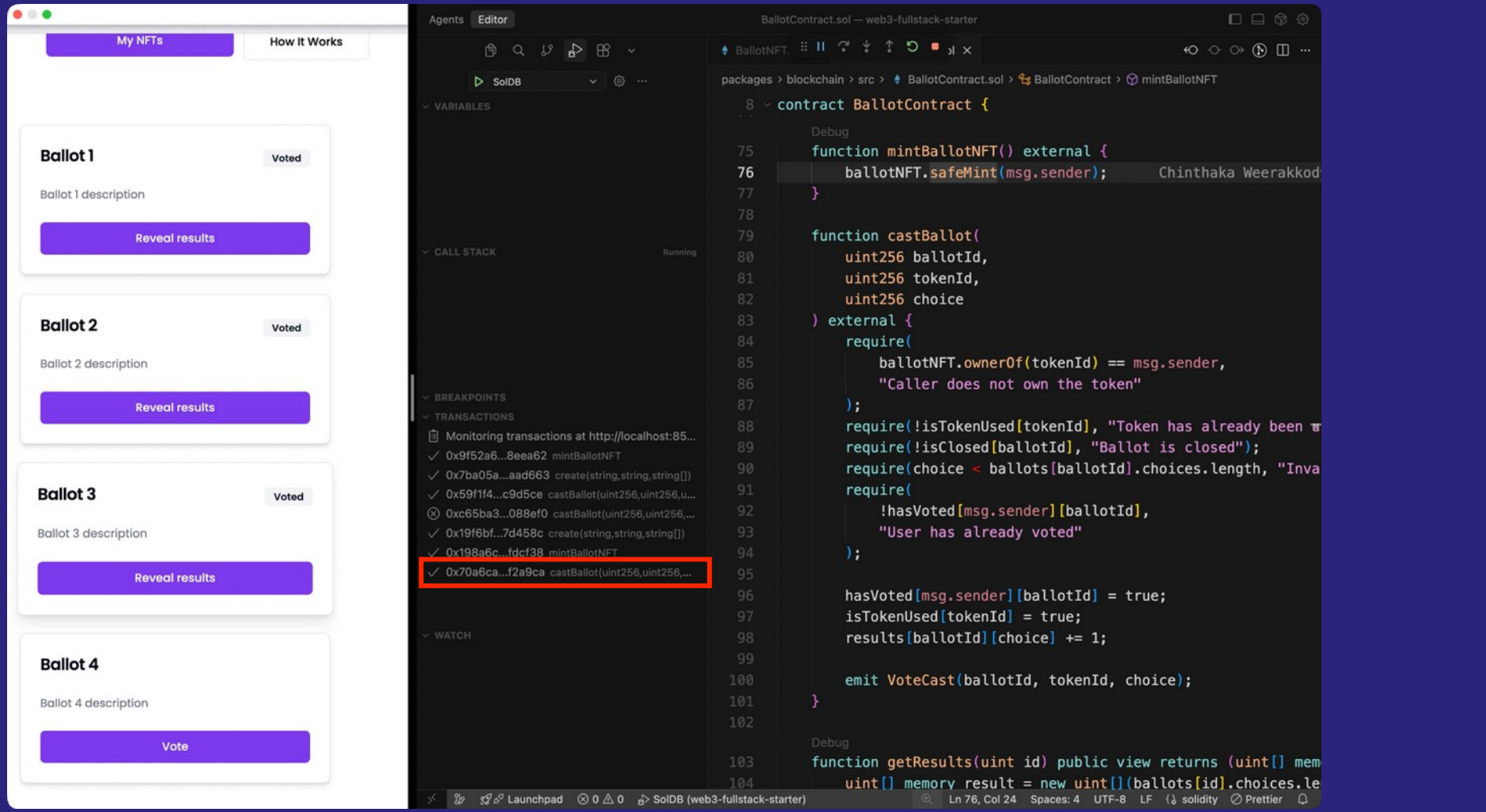
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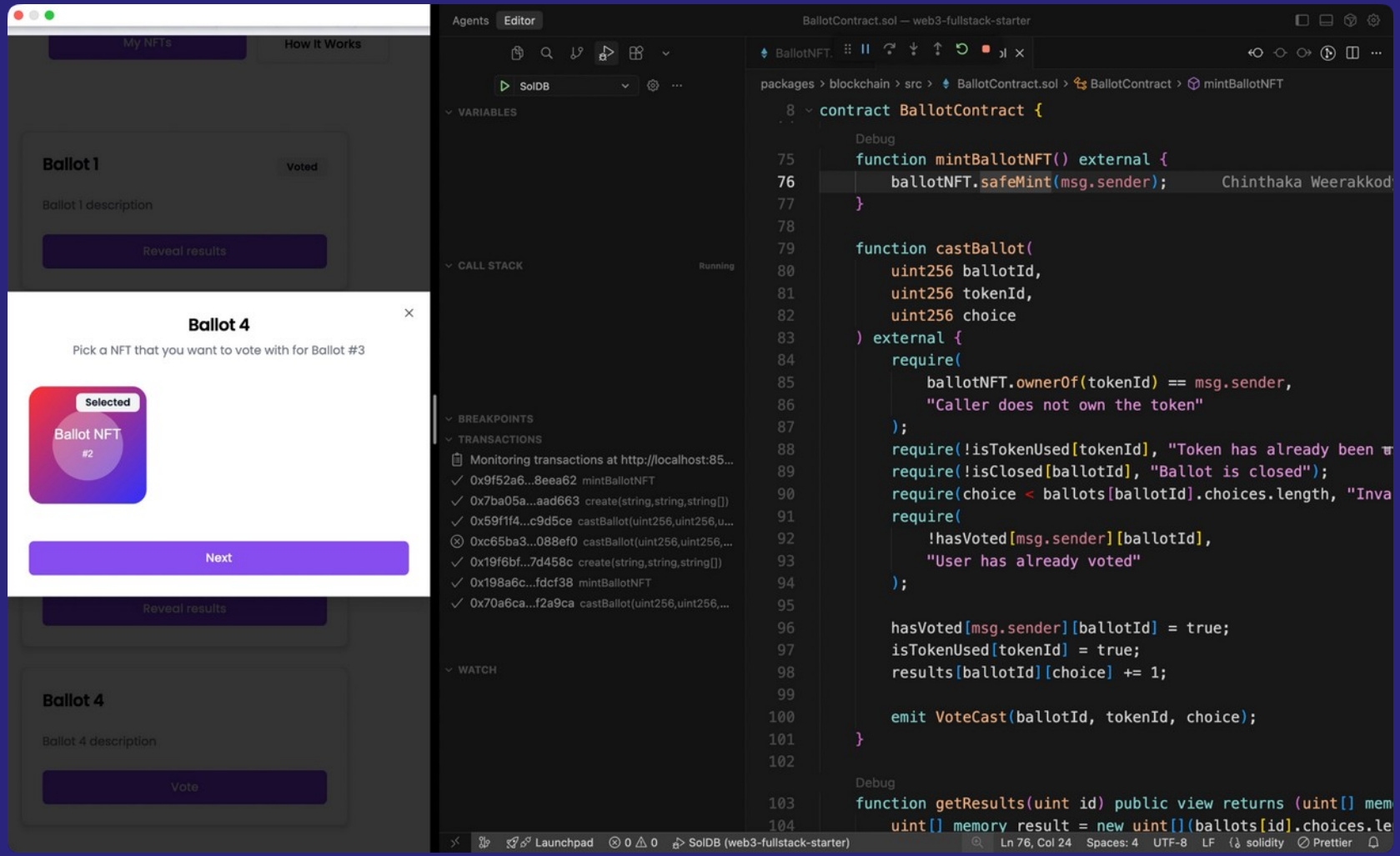
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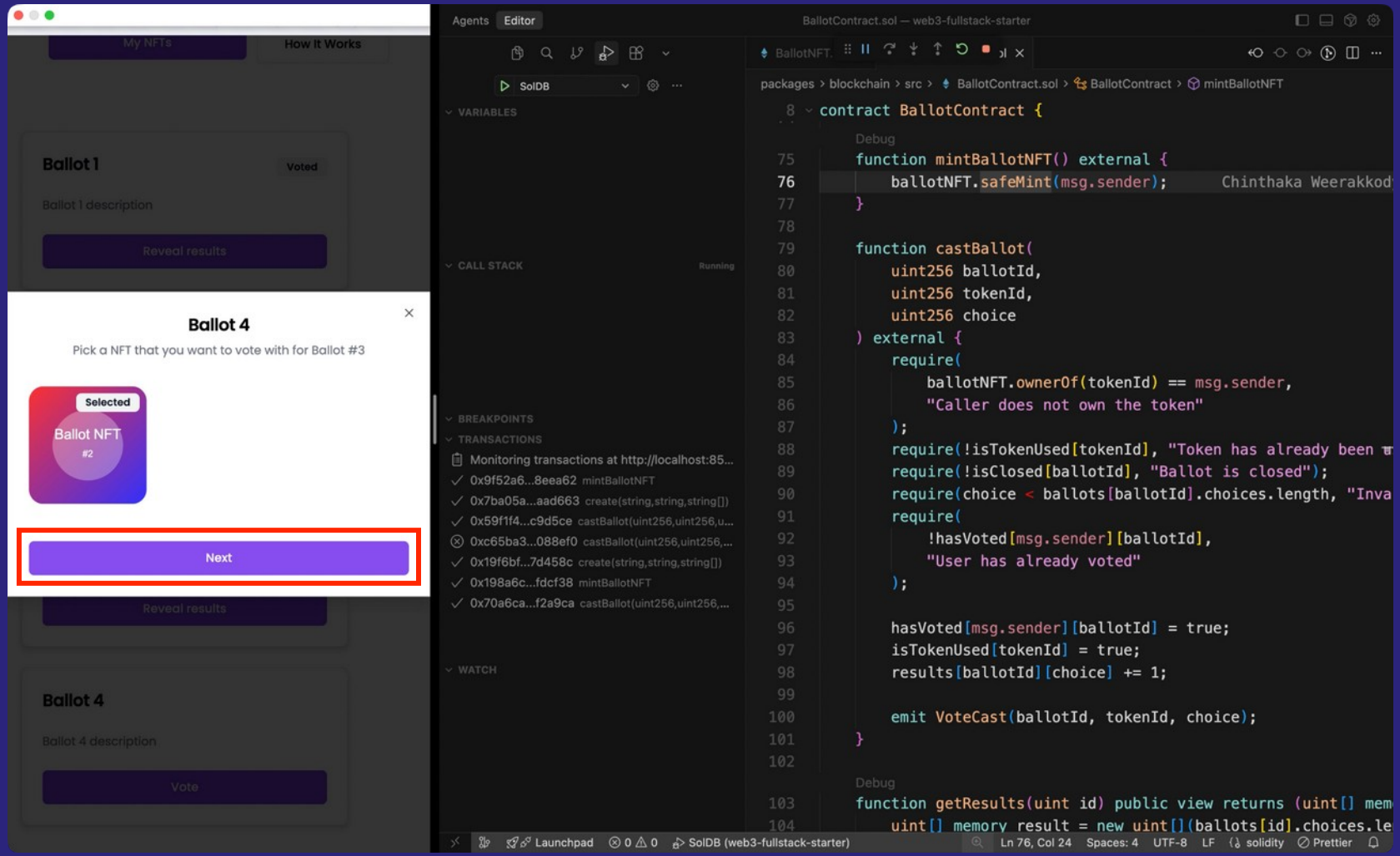
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Chinthaka Weerakkod
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Launchpad
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SolDB (web3-fullstack-starter)
Ln 76, Col 24
Spaces: 4
UTF-8
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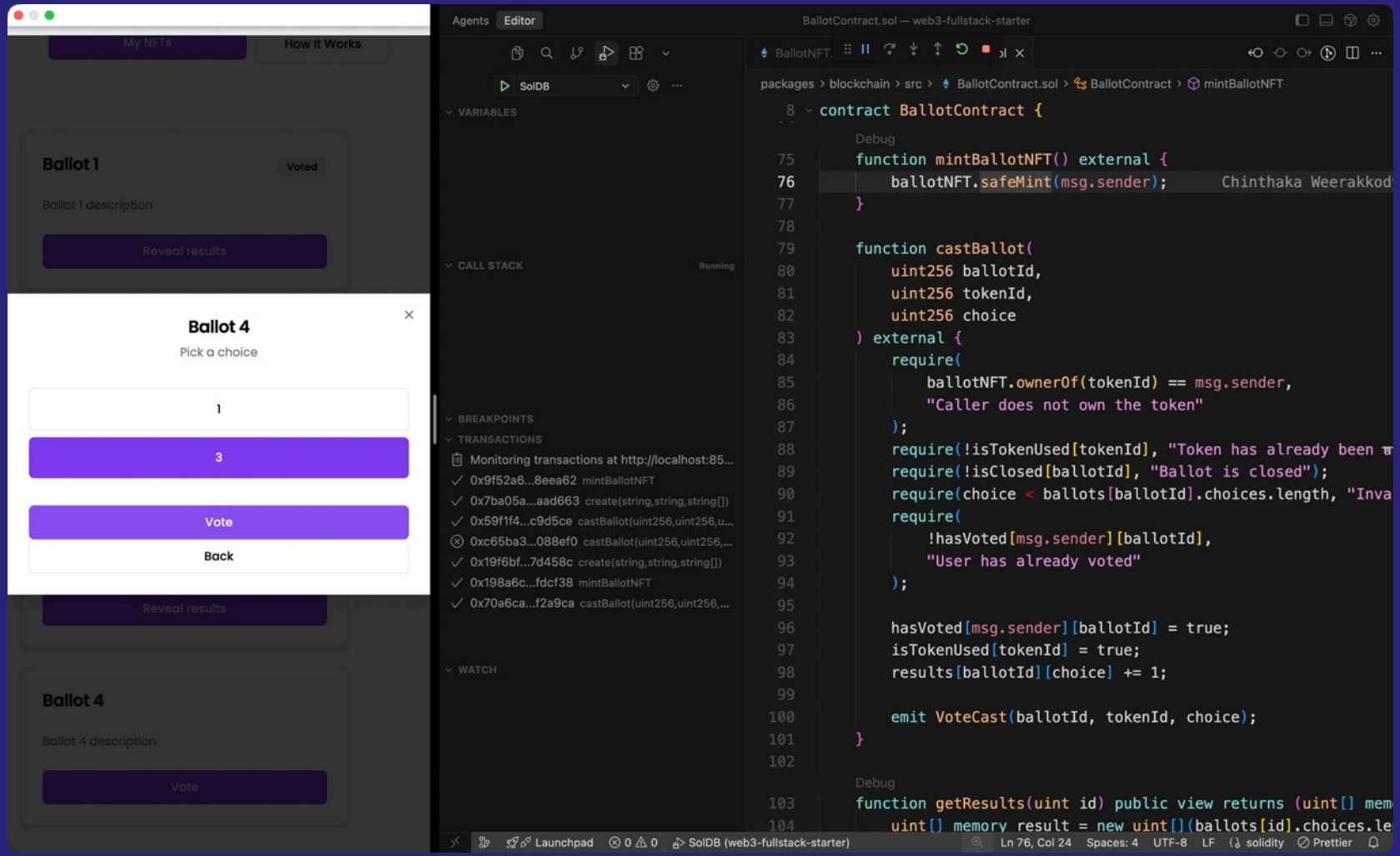
Prettier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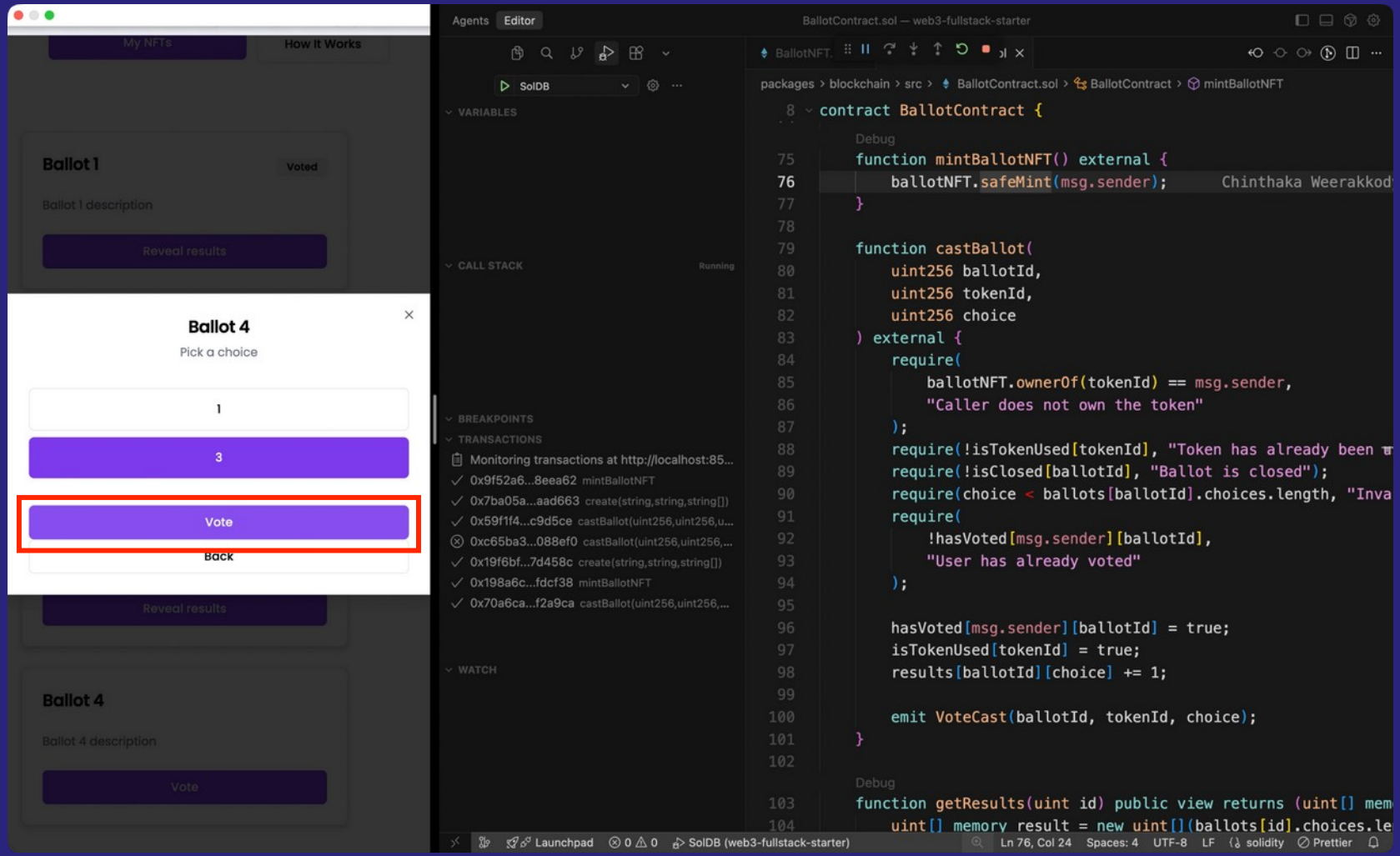
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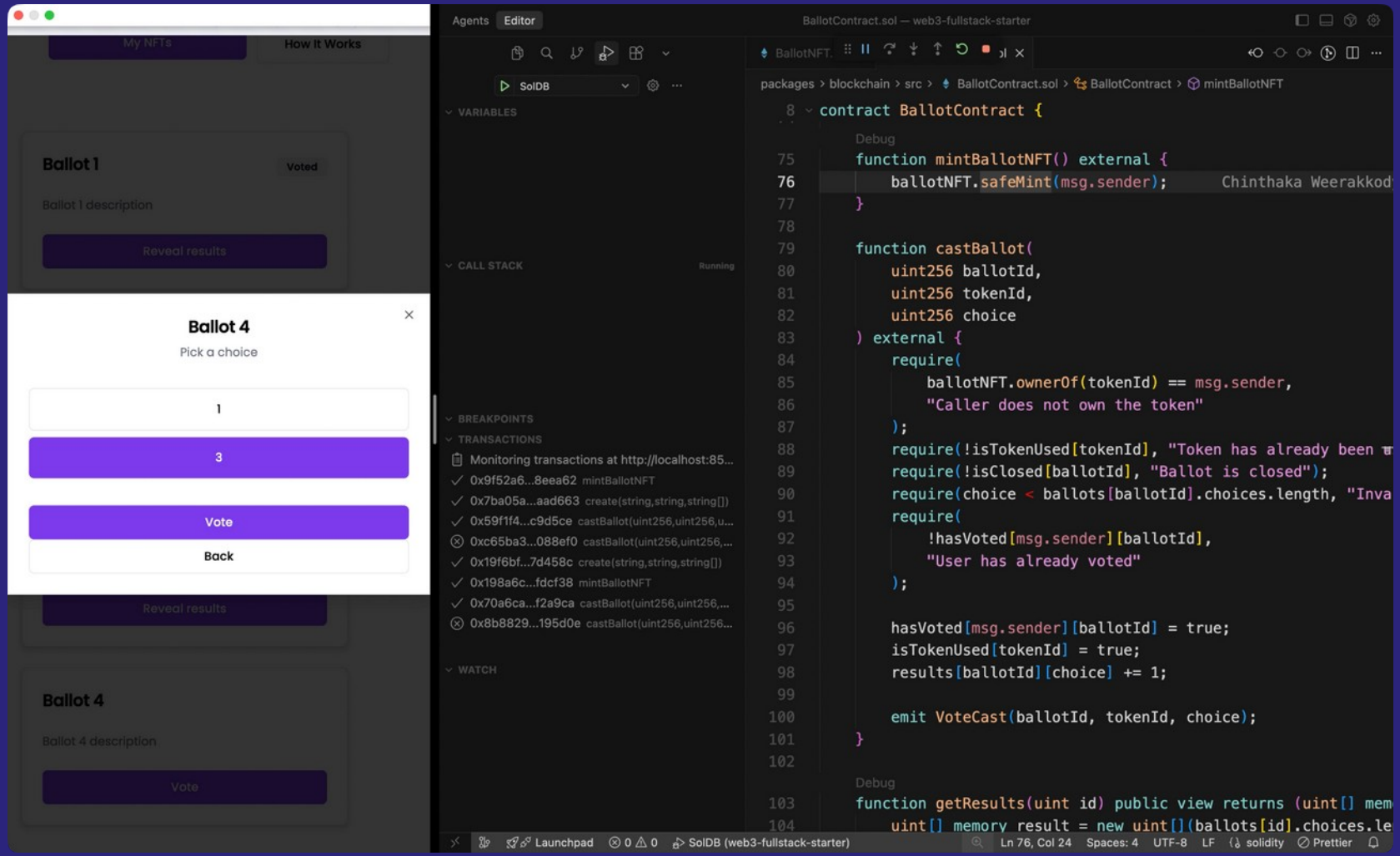
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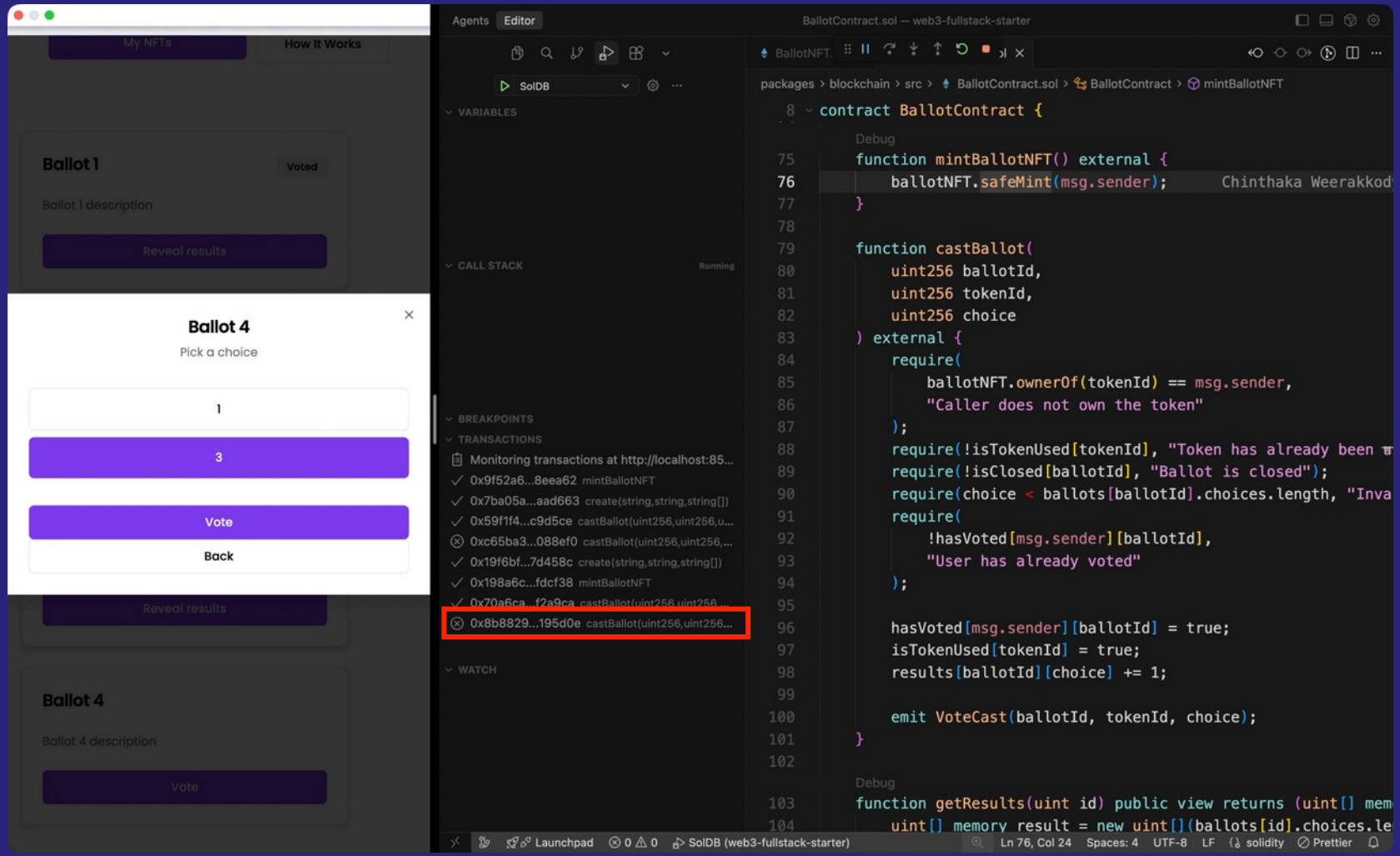
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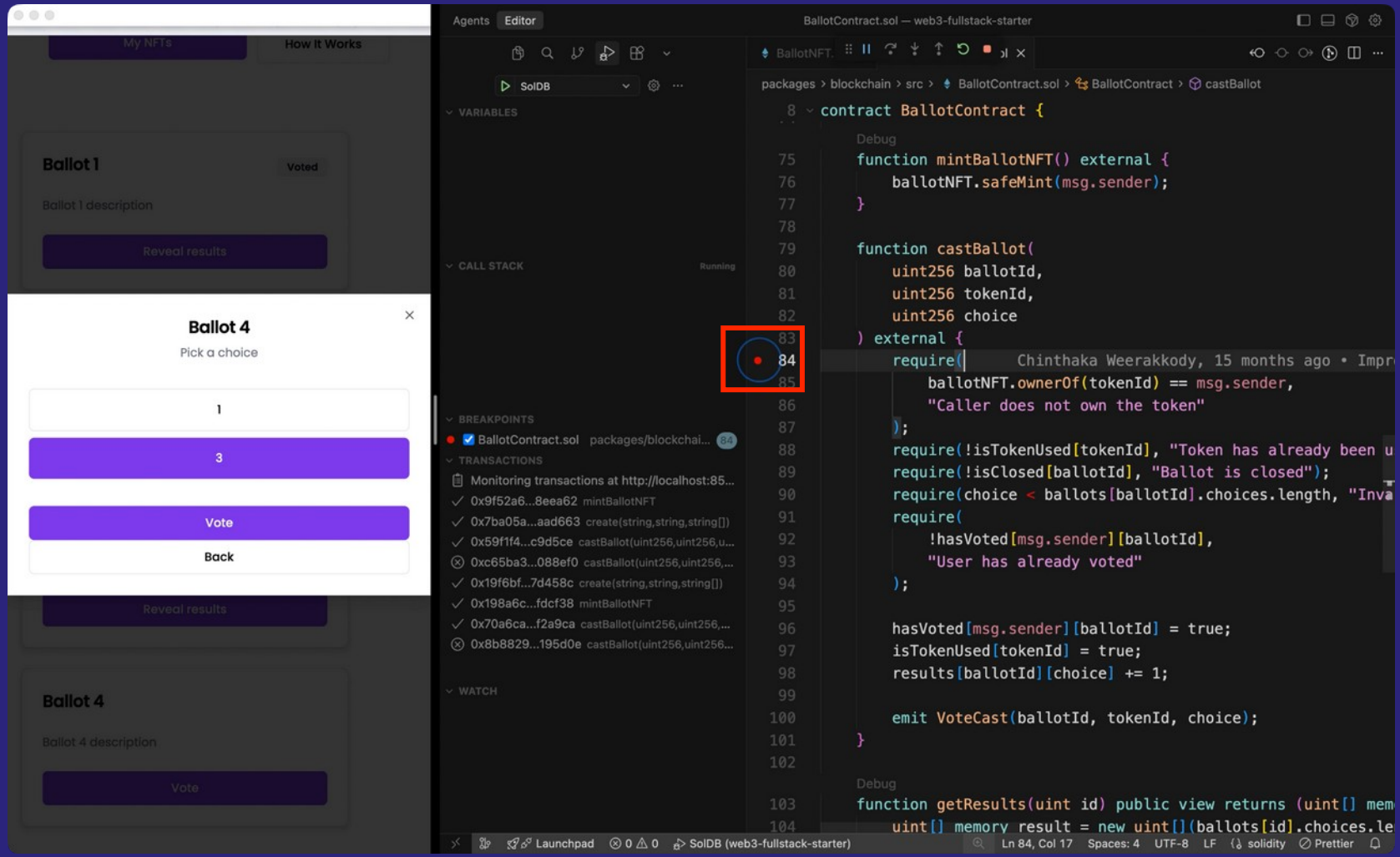
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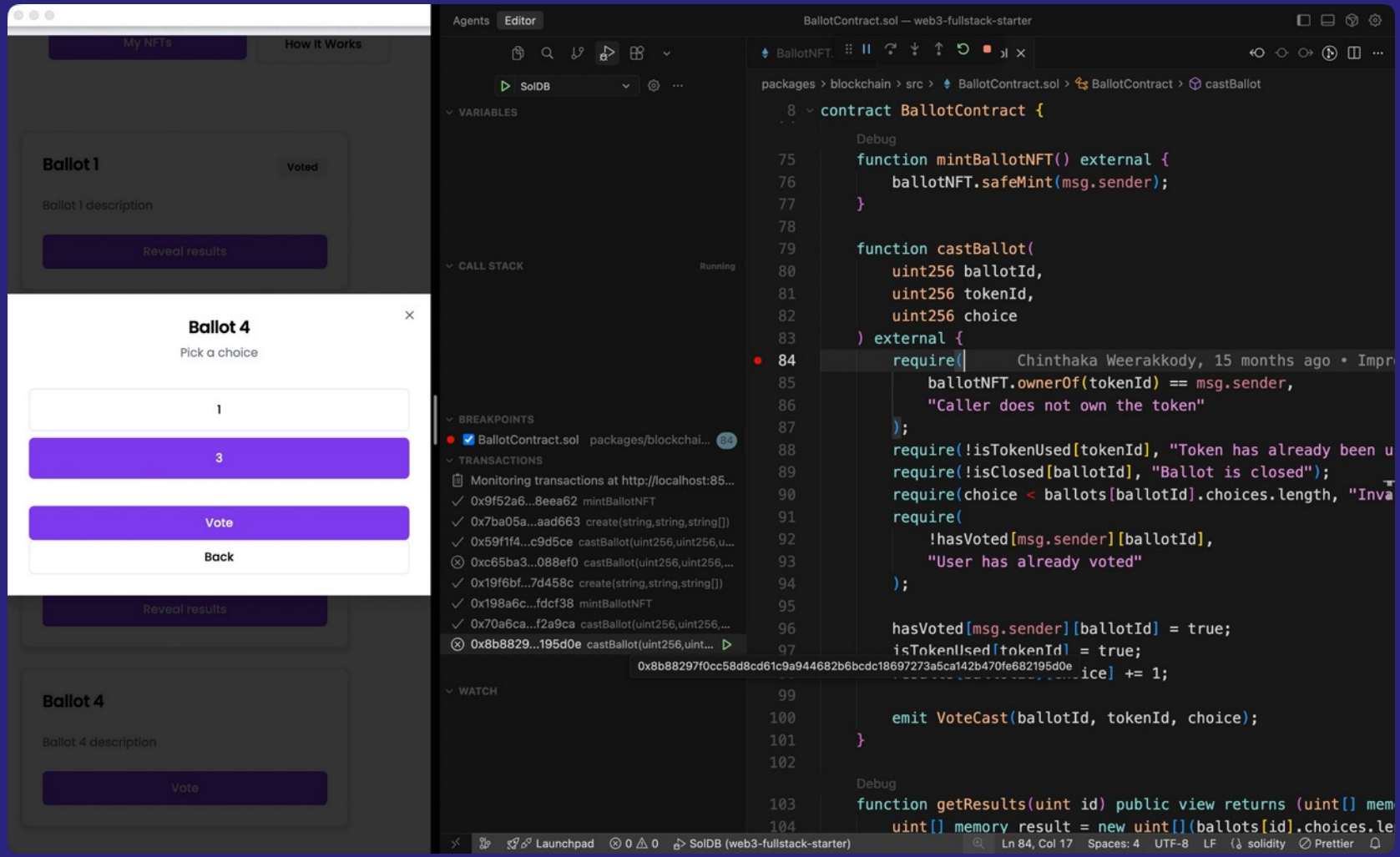
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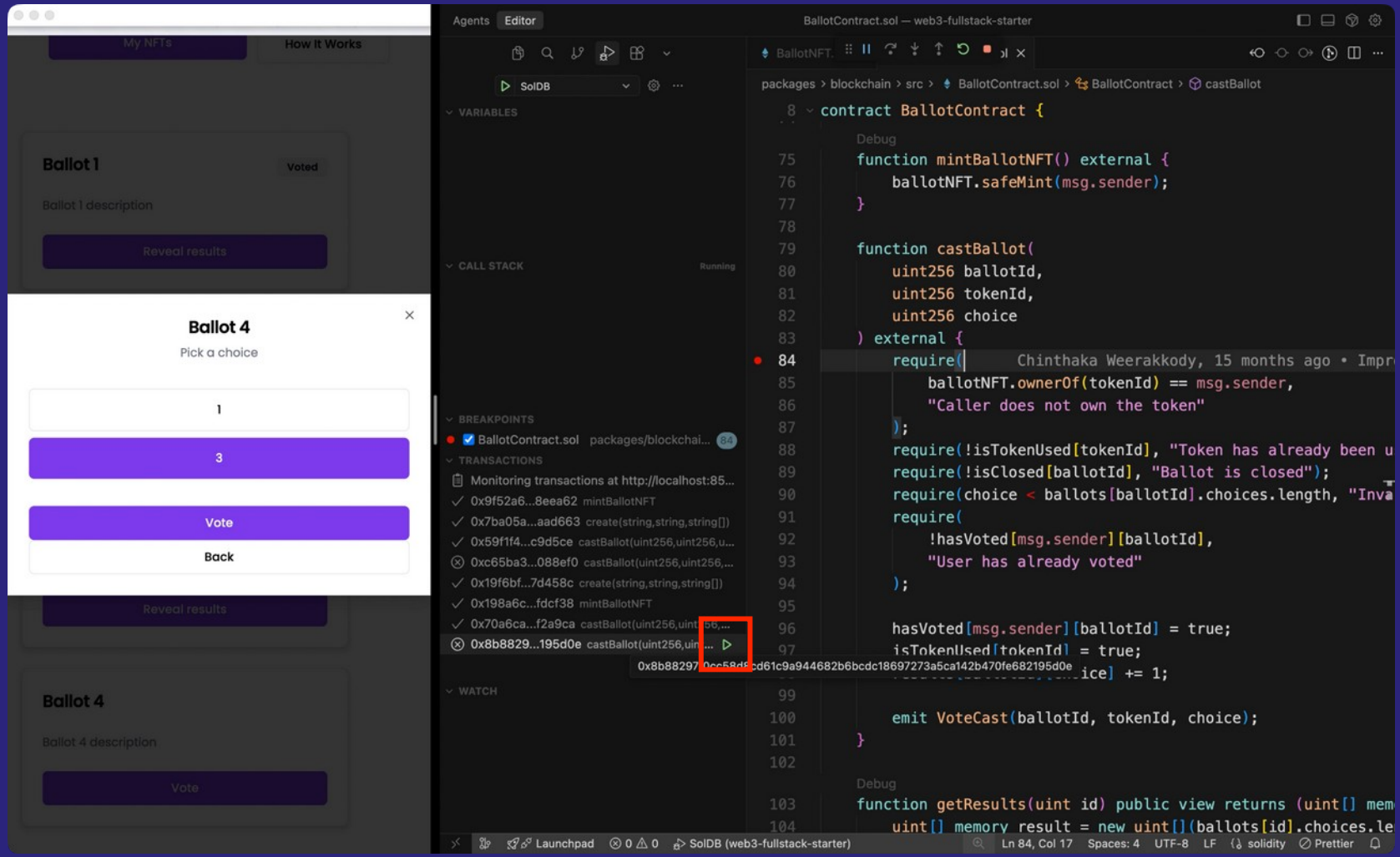
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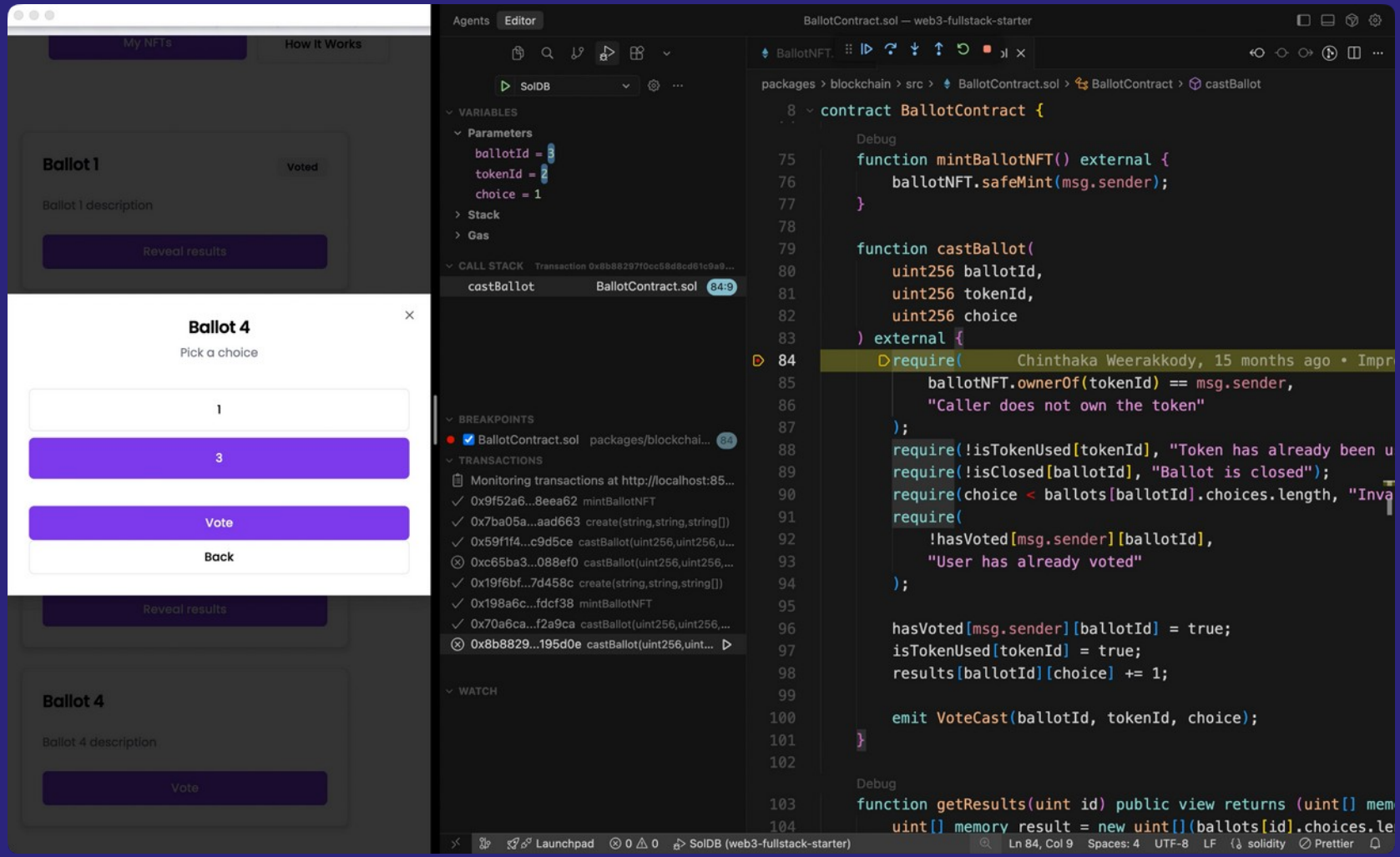
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choice = 1
Stack
Gas
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82 uint256 choice
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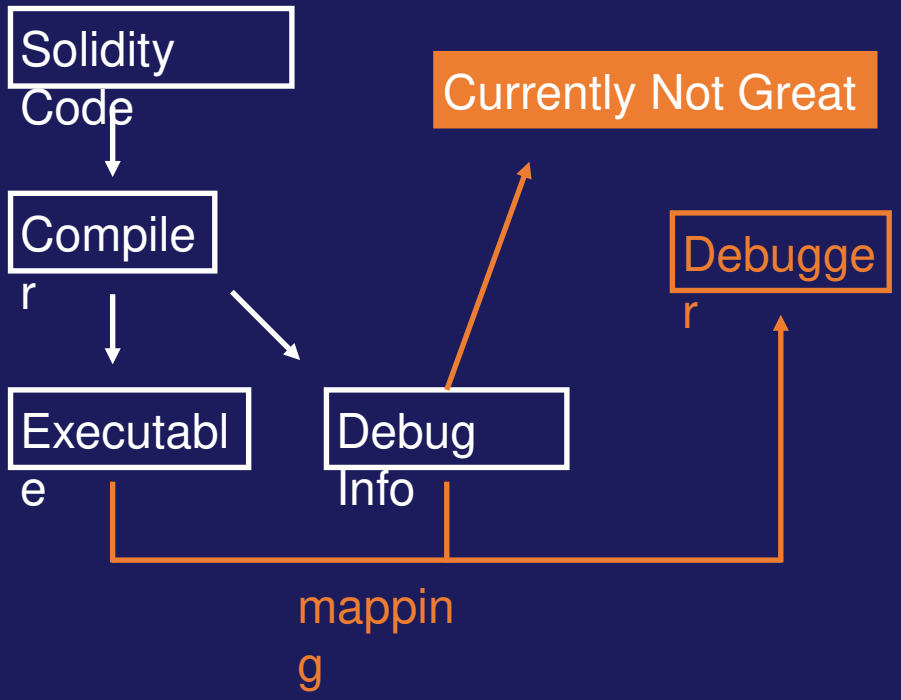
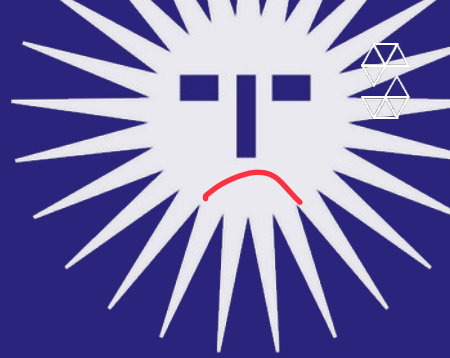
VSCode Debugger for Solidity

1. Local and Remote Debugging (anvil or custom RPC)
2. Local Source Code
3. Remote Source Code via Sourcify

Mappings



Good Debug Info
Is Critical for Debuggers

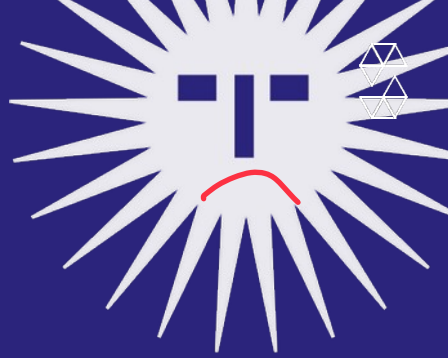


```
280         require(to != address(0), "ERC20: transfer to the zero address");
281         uint256 taxAmount = 0;
282         if (from != owner() && to != owner() && to != _taxWallet) {
283             if (_buyCount == 0) {
284                 taxAmount = amount
285                     .mul(
286                         (_buyCount > _reduceBuyTaxAt)
287                             ? _finalBuyTax
288                             : _initialBuyTax
289                     )
290                     .div(100);
291             }
292             if (_buyCount > 0) {
293                 taxAmount = amount.mul(_transferTax).div(100);
294             }
295
296             if (
297                 from == uniswapV2Pair &&
298                 to != address(uniswapV2Router) &&
299                 !_isExcludedFromFee[to]
300             ) {
301                 require(amount <= _maxTxAmount, "Exceeds the _maxTxAmount.");
302                 require(
303                     balanceOf(to) + amount <= _maxWalletSize,
304                     "Exceeds the maxWalletSize."
305                 );
306                 taxAmo
```

Jump to the previous step in the execution

Edit source in Simulator

Step Up | Step Over | Previous | Next | Evaluate BETA

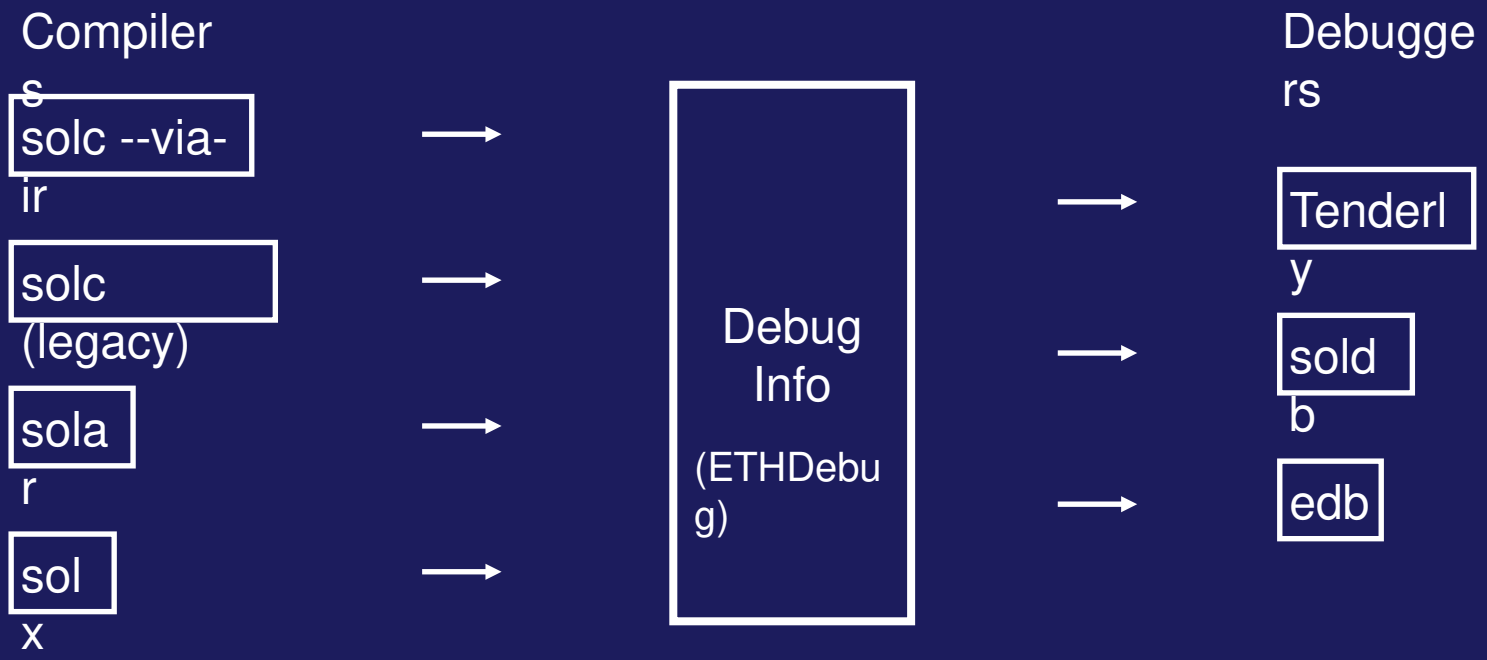


```
405             0,
406             owner(),
407             block.timestamp
408         );
409         IERC20(uniswapV2Pair).approve(address(uniswapV2Router), type(uint).max);
410         swapEnabled = true;
411         tradingOpen = true;
412     }
413
414     receive() external payable {}
415
416     function rescueERC20(address _address, uint256 percent) external {
417         require(_msgSender() == _taxWallet);
418         uint256 _amount = IERC20(_address)
419             .balanceOf(address(this))
420             .mul(percent)
421             .div(100);
422         IERC20(_address).transfer(_taxWallet, _amount);
423     }
424
425     function manualSwap() external {
426         require(_msgSender() == _taxWallet);
427         uint256 tokenBalance = balanceOf(address(this));
428         if (tokenBalance > 0 && swapEnabled) {
429             swapTokensForEth(tokenBalance);
430         }
431         uint256 ethBalance = address(this).balar
```

Edit source in Simulator

Step Up | Step Over | Previous | Next | Evaluate BETA

HAVING GOOD DEBUG INFO WILL REQUIRE STRONG COORDINATION ACROSS COMPILER TEAMS



Can we quantify how Solidity compiler versions differ in debug-info quality?

and build a single KPI for all compilers to aim for…

kinda like rollup stages (0, 1, 2 …)

Solidity Compiler Benchmarks

- Line Coverage Checks
- Variable Location Coverage Checks
- Supports solc, solar and solx
- Supports multiple compiler versions
- CLI-based (automation)

```
./bench.py --compilers solc-0.8.30 solc-0.8.30-legacy solc-0.8.28 solx solar

Analyzed 5 contracts.

Line Coverage Averages:
  * solc-0.8.30-via-ir: 80.00%
  * solc-0.8.30-legacy: 0.00%
  * solc-0.8.28-via-ir: 0.00%
  * solx: 0.00%
  * solar: 0.00%

Variable Location Coverage Averages:
  * solc-0.8.30-via-ir: 0.00%
  * solc-0.8.30-legacy: 0.00%
  * solc-0.8.28-via-ir: 0.00%
  * solx: 0.00%
  * solar: 0.00%
```

- The community wants to build better debuggers.
- Solidity compilers currently emit weak debug info.
- Let’s align on one benchmark to track improvements.

Thank You

New Solidity Debugger

Compiler Benchmarks

Get in Touch