A Beginner’s Intro to Remix

(version with all files in the GIST)

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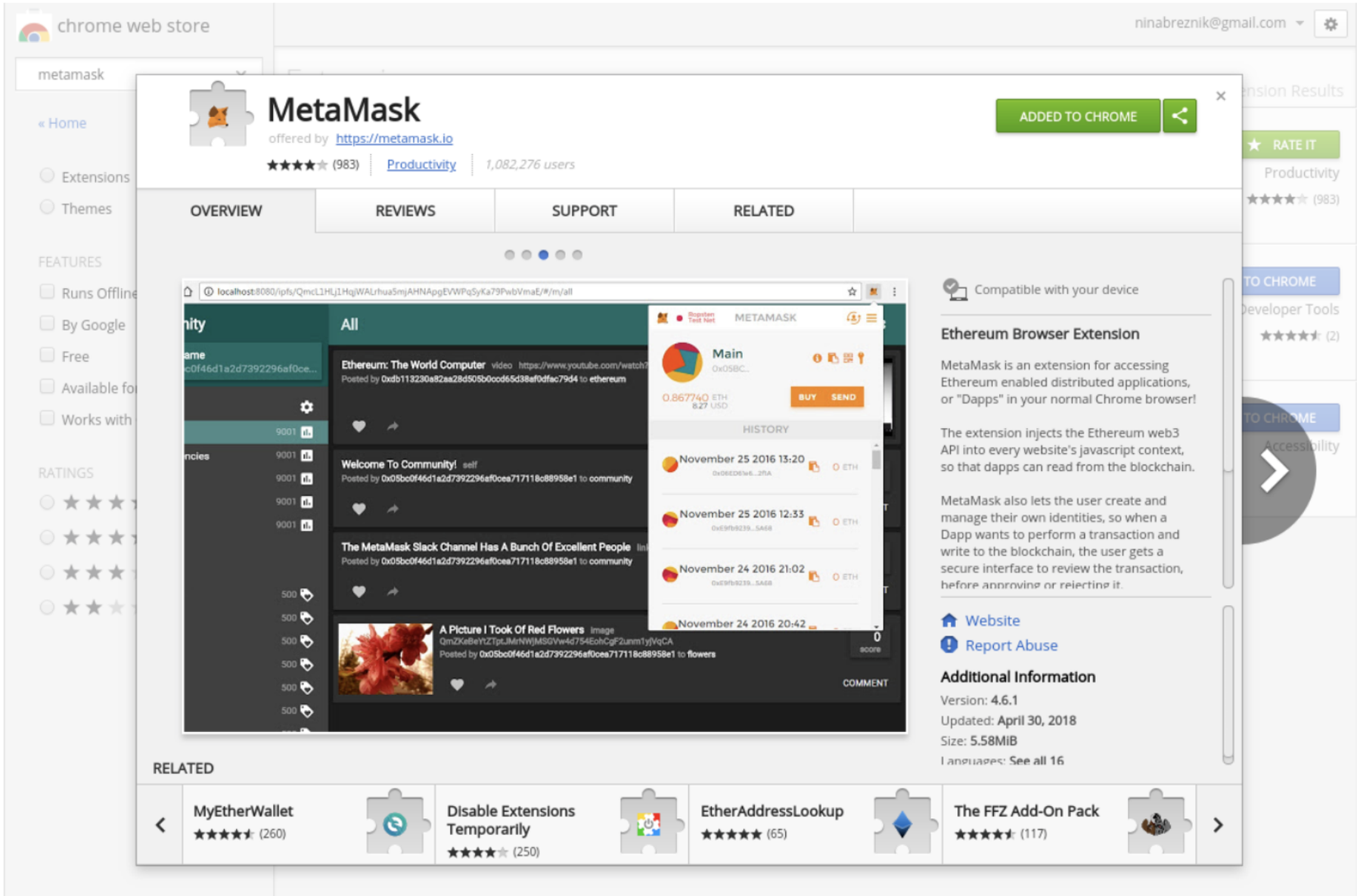
Part 1

Tour, Loading Contracts, & Compiling

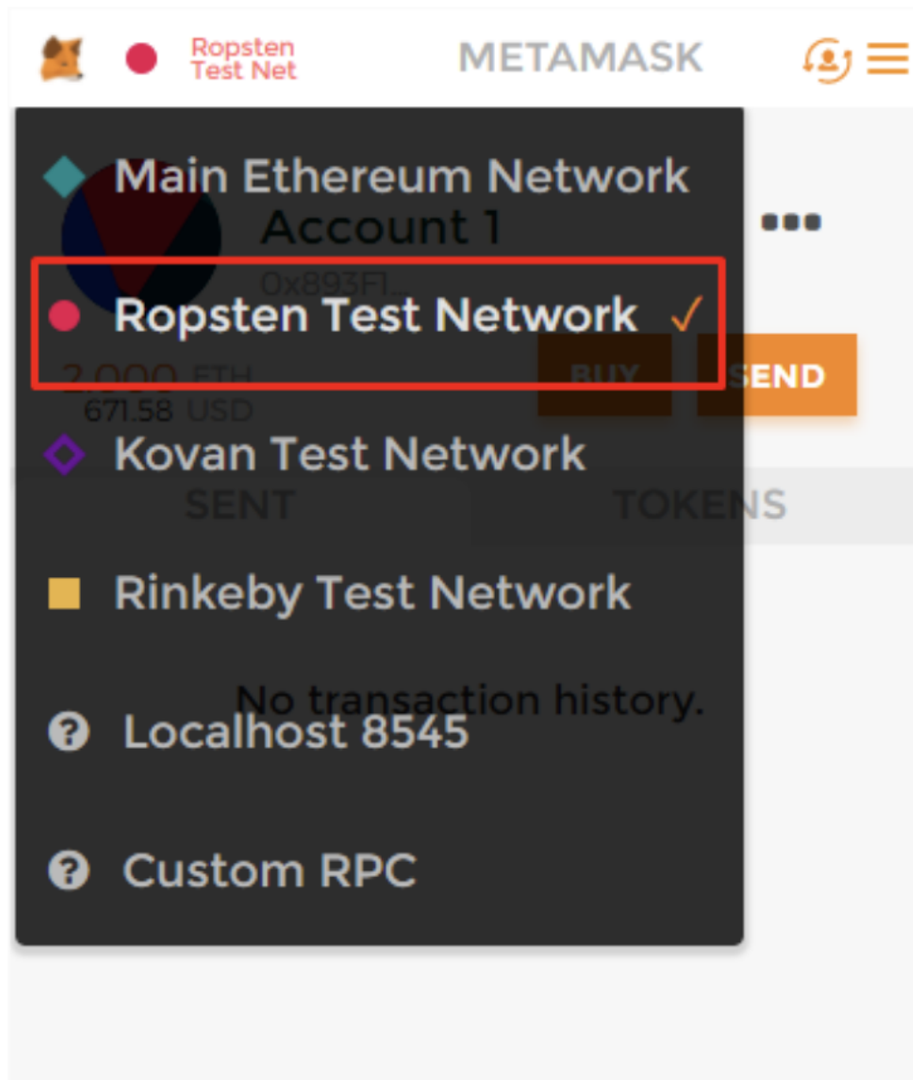
Install Metamask

chrome.google.com/webstore



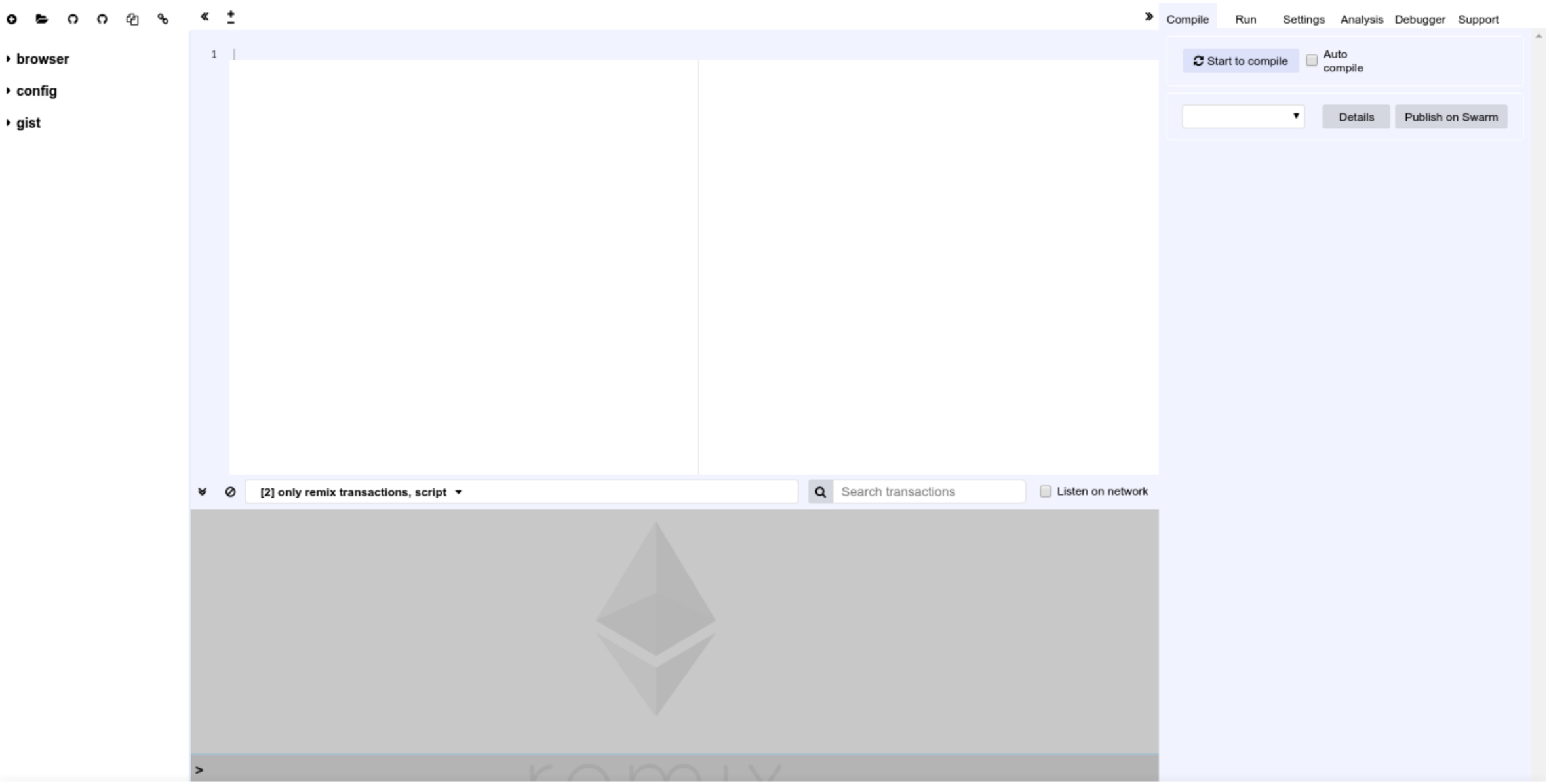
Login to Metamask

Robsten Test Network



Let’s get started

https://bit.ly/remix-workshop-repository



Remix Tour

https://remix-alpha.ethereum.org

File Explorer

- browser
  - AwardToken.sol
  - Ballot2.sol
  - Ballot_orig.sol
  - Donation.sol
  - README.md
  - multiSig2.sol
  - multisig.sol
  - multisig1.sol
  - scenario.json
  - setup.txt
- config

browser/Ballot_orig.sol

Editor

```
pragma solidity ^0.4.0;
contract Ballot {

    struct Voter {
        uint weight;
        bool voted;
        uint8 vote;
        address delegate;
    }
    struct Proposal {
        uint voteCount;
    }

    address chairperson;
    mapping(address => Voter) voters;
    Proposal[] proposals;
```

[2] only remix transactions, script

Search transactions

Terminal

```
 - Welcome to Remix v0.6.4 -

You can use this terminal for:
 - Checking transactions details and start debugging.
 - Running JavaScript scripts.
 - Running JavaScript scripts involving web3 if the current environement is injected p
rovider or Web3 provider.
 - Executing common command to interact with the Remix interface (see list of commands
 below). Note that these command can also be included in a JavaScript script.

remix.debug(hash): Start debugging a transaction.

remix.loadgist(id): Load a gist in the file explorer.

remix.loadurl(url): Load the given url in the file explorer. The url can be of type gi
thub, swarm or ipfs.

remix.setproviderurl(url): Change the current provider to Web3 provider and set the ur
l endpoint.

remix.exeCurrent(): Run the script currently displayed in the editor

remix.help(): Display this help message
```

Console

Compile Tab (active)

Compile | Run | Settings | Analysis | Debugger | Support

Start to compile | Auto compile | Hide warnings

Ballot

Details | Publish on Swarm | ABI | Bytecode

Static Analysis raised 2 warning(s) that requires your attention.
Click here to show the warning(s).

```
browser/Ballot_orig.sol:19:5: Warning: Defining c
    function Ballot(uint8 _numProposals) public
    ^ (Relevant source part starts here and spans
```

Run Tab

Compile | Run | Settings | Analysis | Debugger | Support | Test

Environment: Injected Web3 — Ropsten (3)

Account: 0x9ae...06ff6 (1.992485469305616838

Gas limit: 3000000

Value: 0 wei

AwardToken

Deploy

Load contract from Address | At Address

Transactions recorded: 4

Deployed Contracts

AwardToken at 0x574...40360 (blockchain)

approve	address _spender, uint256 _value
closeRound	
closeRoundEarly	
decreaseApproval	address _spender, uint256 _subtractedValue
finishMinting	
increaseApproval	address _spender, uint256 _addedValue
mint	address _to, uint256 _amount
renounceOwnership	

Universal DAPP

UI to the Contract

Remix Commands

https://remix-alpha.ethereum.org

browser
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browser/Ballot_orig.sol

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    address chairperson;
    mapping(address => Voter) voters;
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[2] only remix transactions, script | Search transactions

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remix.exeCurrent(): Run the script currently displayed in the editor

remix.help(): Display this help message

>
```

Set environment

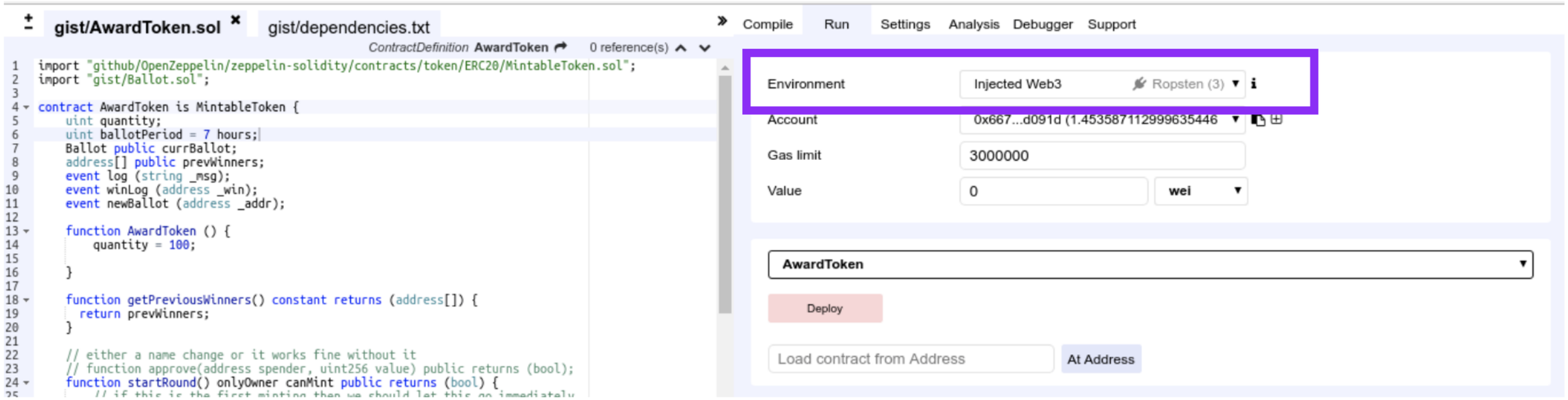
Run tab-> Environment:

Javascript VM - a simple and quick environment – only visible to your machine

Injected web3 (Ropsten) – or whatever testnet you have setup in metamask

Web3 Provider

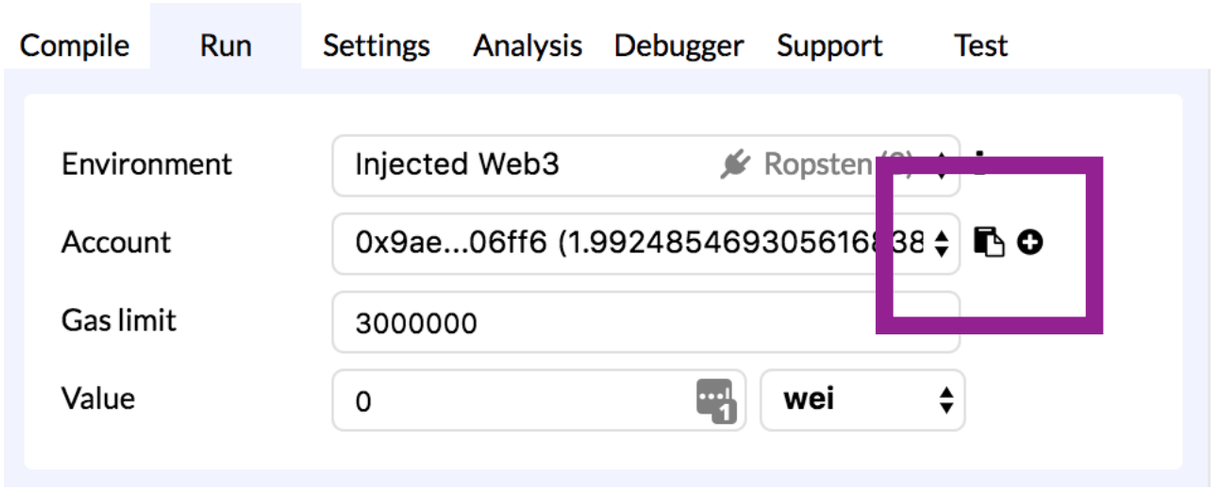
Choose: **Injected web3 (Ropsten)**



Get some TEST ether

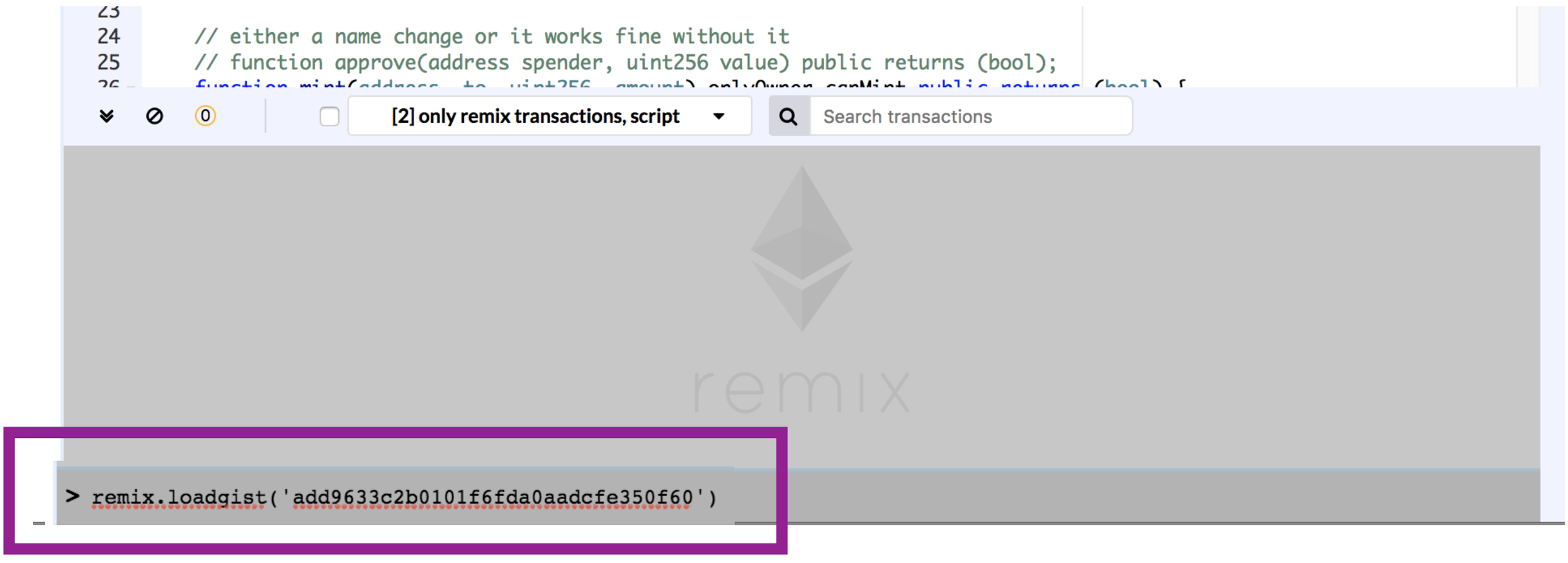
http://faucet.ropsten.be:3001/

But FIRST:
Copy your address - here or in Metamask



Load files to Remix

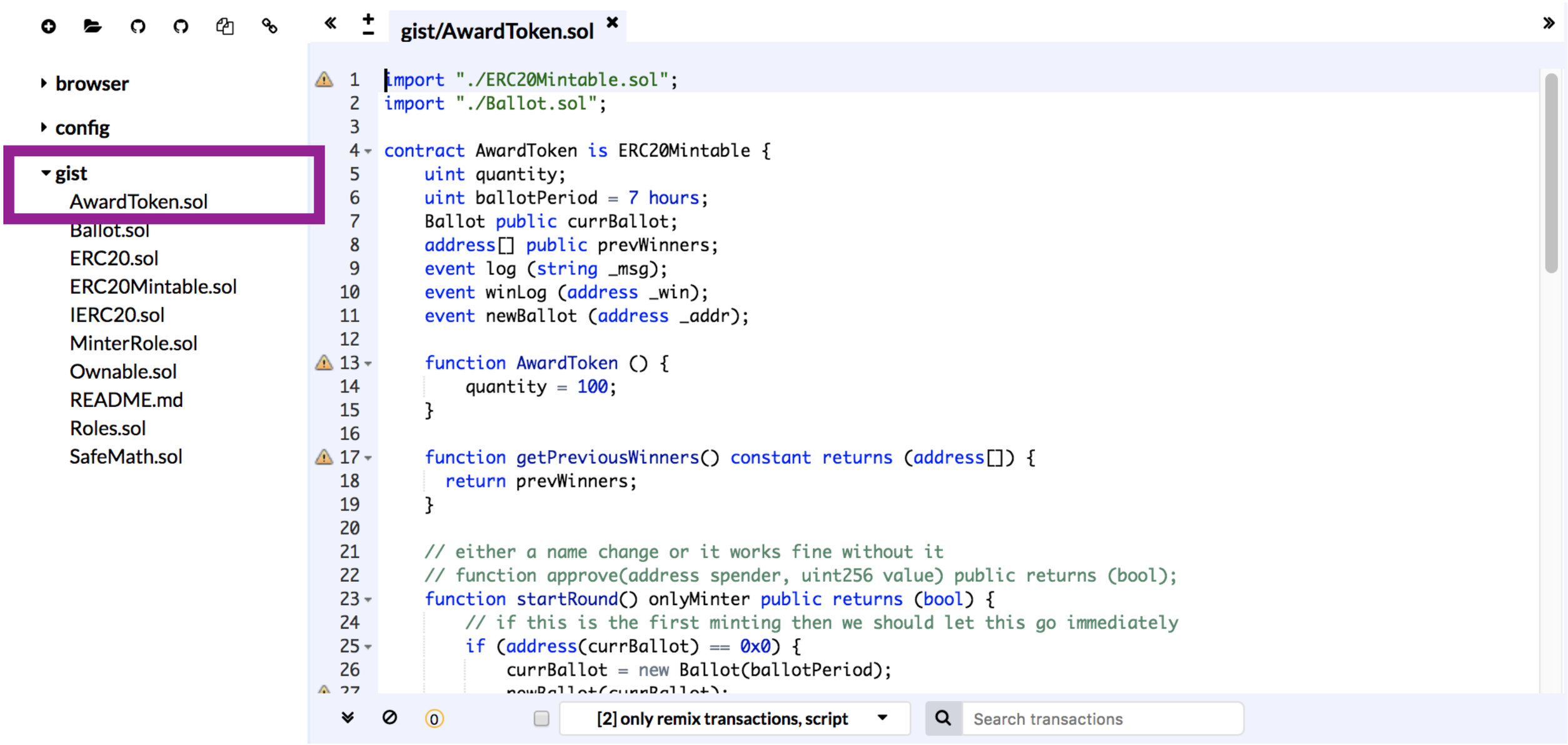
remix.loadgist('add9633c2b0101f6fda0aadcfe350f60')



here in the console

Open file

gist/AwardToken



Compile the contract

Compile tab: Start to compile button

(when dependencies.js is the active file)

gist/dependencies.js | gist/AwardToken.sol

```
import "github/OpenZeppelin/zeppelin-solidity/contracts/token/ERC20/MintableToken.sol";
import "gist/Ballot.sol";

contract AwardToken is MintableToken {
    uint quantity;
    uint ballotPeriod = 7 hours;
    Ballot public currBallot;
    address[] public prevWinners;
    event log (string _msg);
    event winLog (address _win);
    event newBallot (address _addr);

    function AwardToken () {
        quantity = 100;
    }

    function getPreviousWinners() constant returns (address[]) {
      return prevWinners;
    }

    // either a name change or it works fine without it
    // function approve(address spender, uint256 value) public returns (bool);
    function startRound() onlyOwner canMint public returns (bool) {
        // if this is the first minting then we should let this go immediately
        if (address(currBallot) == 0x0) {
```

Compile | Run | Settings | Analysis | Debugger | Support | Test

Start to compile | Auto compil | Hide warnings

AwardToken

Details | Publish on Swarm | ABI | Bytecode

Static Analysis raised 38 warning(s) that requires your attention. Click here to show the warning(s).

```
gist/Ballot.sol:26:5: Warning: Defining constructors as func
    function Ballot(uint duration) public {
    ^ (Relevant source part starts here and spans across mul
```

```
gist/AwardToken.sol:13:5: Warning: Defining constructors as
    function AwardToken () {
    ^ (Relevant source part starts here and spans across mul
```

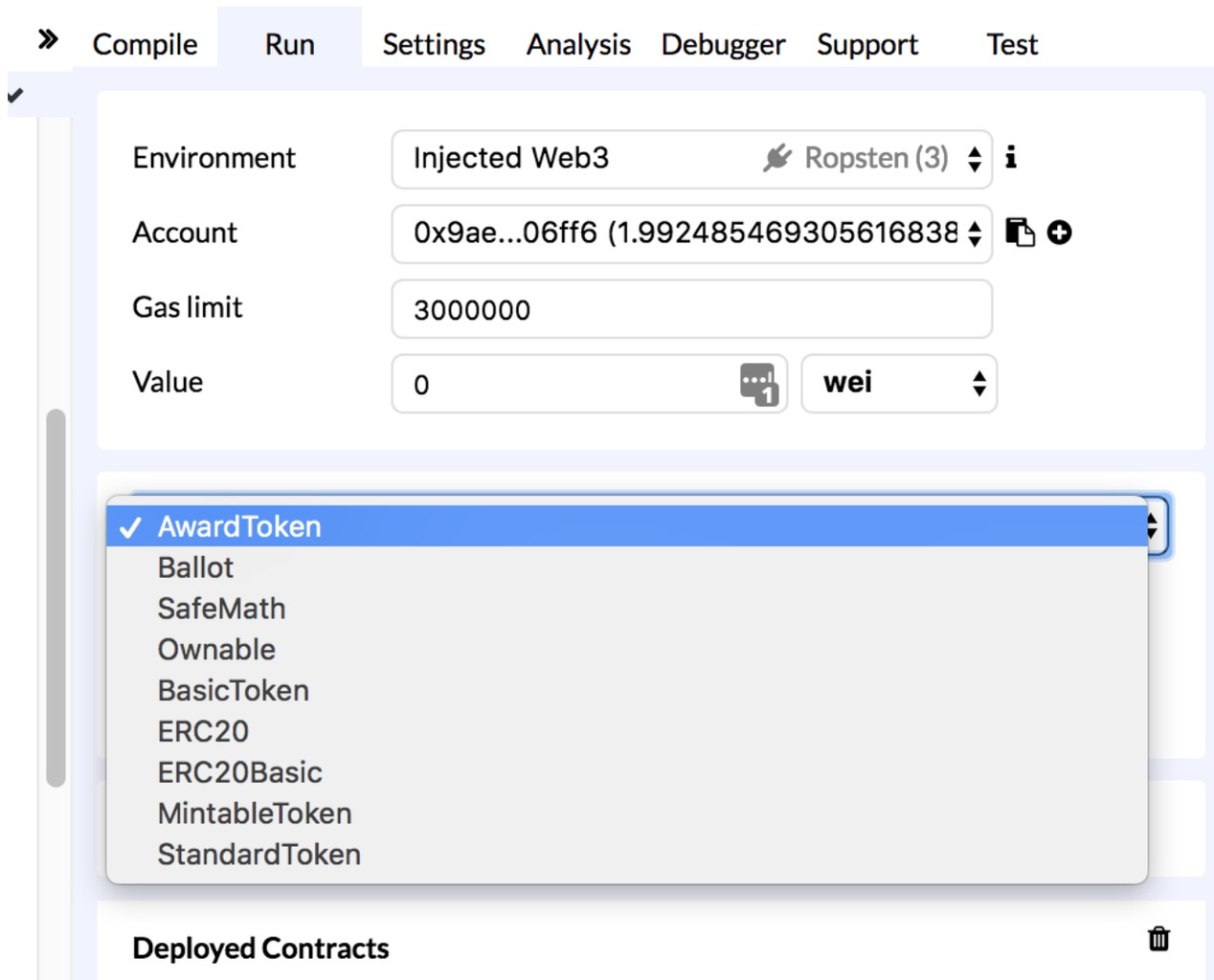
```
gist/AwardToken.sol:1:1: Warning: Source file does not speci
```

[2] only remix transactions, script | Search transactions

See compiled contracts

AwardToken + all dependencies

Imported Contracts

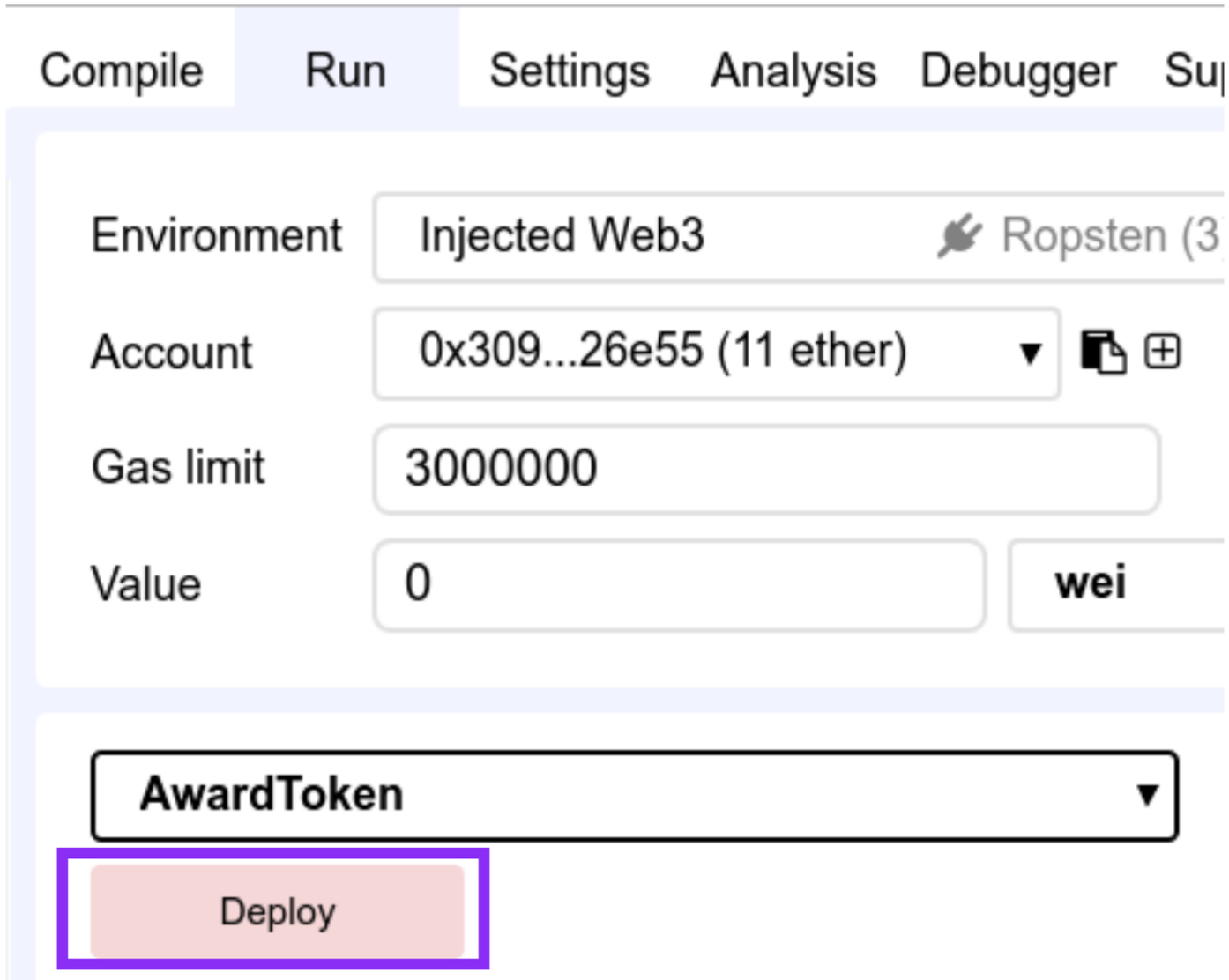


Part II

Deploy & AtAddress

Deploy the contract

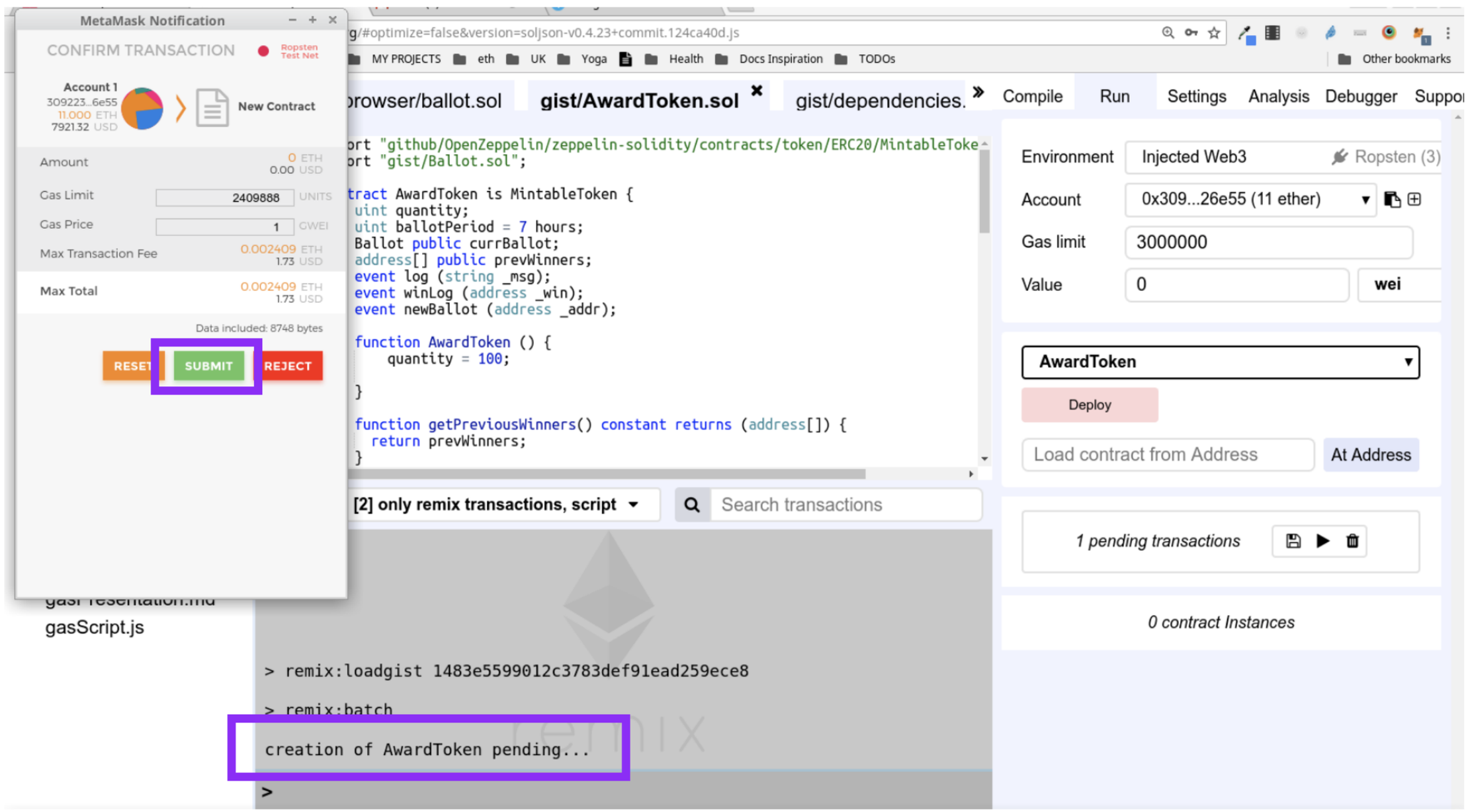
Run tab: Deploy button



Confirm the transaction

Submit button

But make sure you put in a gas price!



Check if tx is mined

Terminal logs in Remix

```
creation of AwardToken pending...

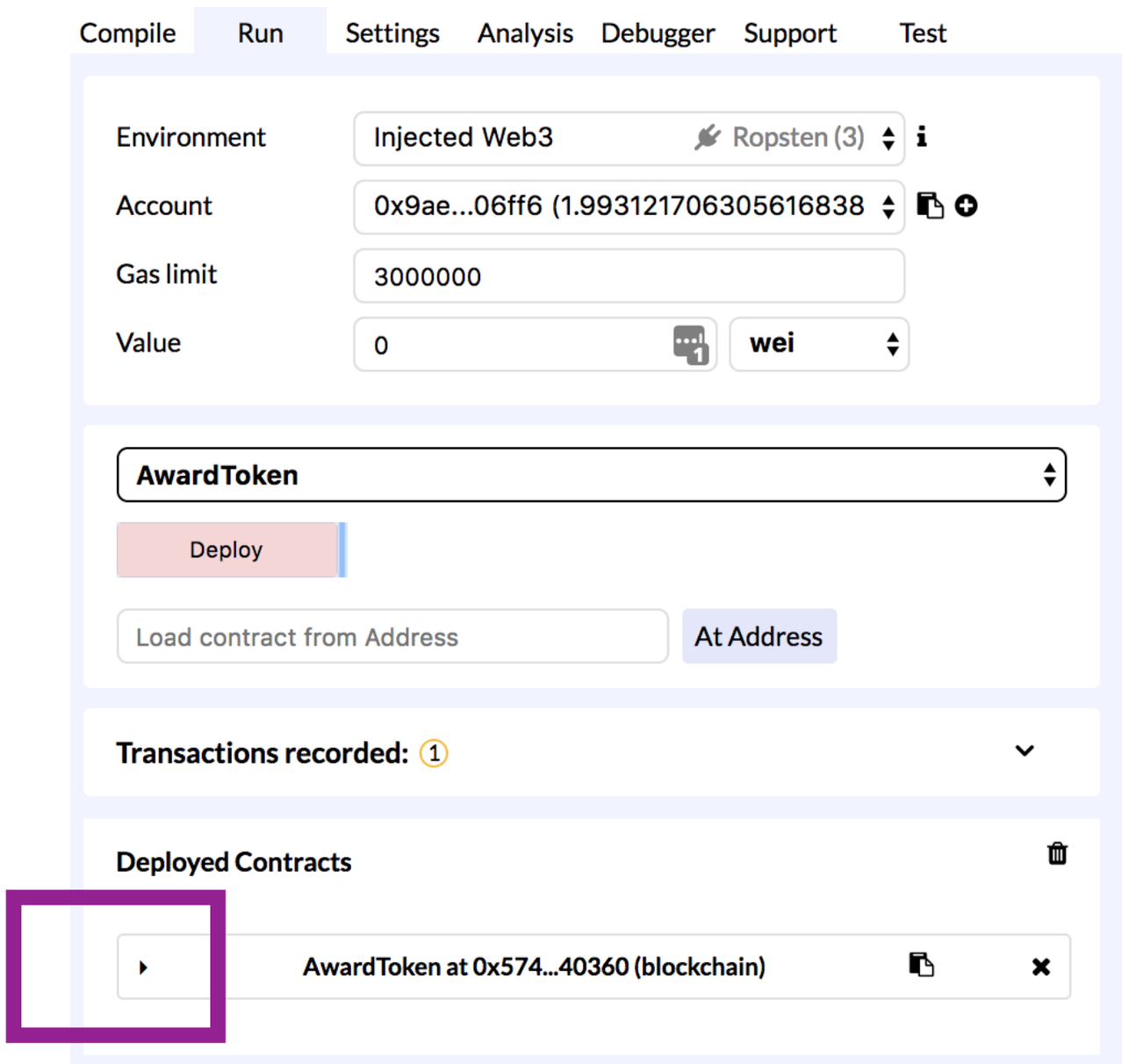
https://ropsten.etherscan.io/tx/0x404a4445ebb3a969b15257a586a61582afa07
dcf02b1b2617f77519b30378be8

▶ [block:3159099 txIndex:2]  from:0x309...26e55
to:AwardToken.(constructor) value:0 wei data:0x608...70029
logs:0 hash:0x404...78be8
```

Debug

Click to see the contract's UI

On the deployed contract



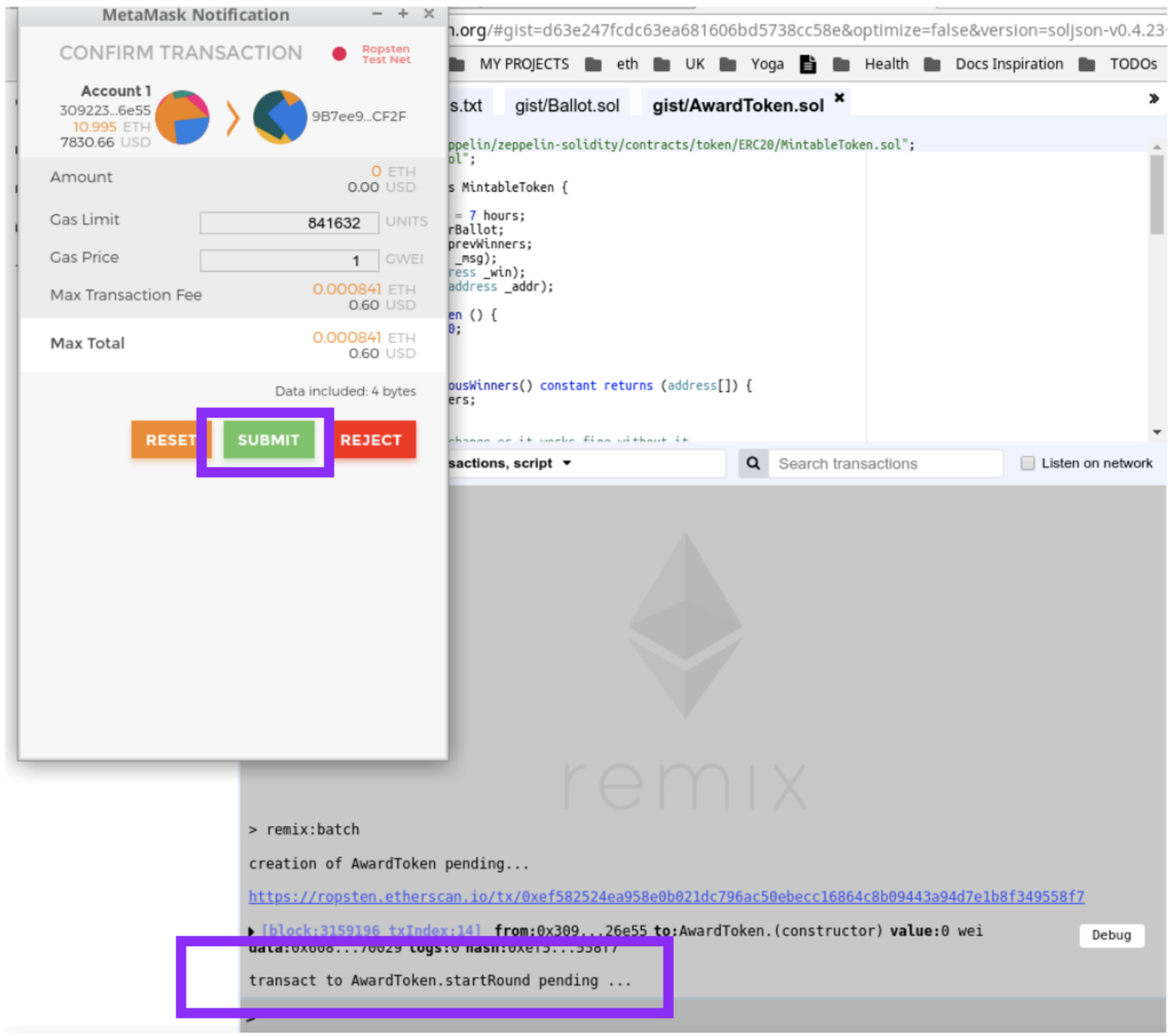
Behold!

The Interactive UI for AwardToken.sol contract

Execute startRound

Its a payable function
(as opposed to a call function - which is free)

Confirm the transaction



Check if tx is mined

In the terminal logs in Remix

```
transact to AwardToken.startRound pending ...
https://ropsten.etherscan.io/tx/0x5a97b4946979f52dfb6dc8ab2fecebb8fd43515ff4e25597ecb9d0a88472c8b2
▸ [block:3159300 txIndex:12]  from:0x309...26e55 to:AwardToken.startRound() 0x9b7...0cf2f
value:0 wei data:0x55e...3f086 logs:1 hash:0x5a9...2c8b2
```

Debug

Expand tx log

to see the logs

[block:3665523 txIndex:4] **from:**0x9ae...06ff6 **to:**AwardToken.startRound() 0x574...40360 **value:**0 wei **data:**0x55e...3f086 **logs:**1 **hash:**0x16c...0a81c

Debug

status	0x1 Transaction mined and execution succeed
transaction hash	0x16c8af5a3fd0e5bcacd8858ab42d4f8eff39fc33bb98290740c03eeb4880a81c
from	0x9ae59af2e33480caa48f2dc6f6cede7ffab06ff6
to	AwardToken.startRound() 0x574d270dc04e89c5d65e24e19f1deb9e17240360
gas	613643 gas
transaction cost	613643 gas
hash	0x16c8af5a3fd0e5bcacd8858ab42d4f8eff39fc33bb98290740c03eeb4880a81c
input	0x55e...3f086
decoded input	{}
decoded output	-
logs	[{ "from": "0x574d270dc04e89c5d65e24e19f1deb9e17240360", "topic": "0x65f35fb257c91daed794331bfd2ad0f4439d49319d52a5b3bfb04c84969fdbeb", "event": "newBallot", "args": { "0": "0xD6052C85A3D26eE9EeC8262d462bfDC672B80D93", "_addr": "0xD6052C85A3D26eE9EeC8262d462bfDC672B80D93", "length": 1 } }]
value	0 wei

Take a look at the startRound function in the editor

– just to see what it is doing...

gist/dependencies.js gist/AwardToken.sol

```
    // function approve(address spender, uint256 value) public returns (bool);
    function startRound() onlyOwner canMint public returns (bool) {
        // if this is the first minting then we should let this go immediately
        if (address(currBallot) == 0x0) {
            currBallot = new Ballot(ballotPeriod);
            newBallot(currBallot);
        } else {
            revert();
        }
    }

    function closeRoundEarly () onlyOwner {
        if (address(currBallot) != 0x0 && !currBallot.timeOut()) {
          currBallot.finish();
        } else revert();
    }

    function closeRound() onlyOwner {
        //  this can only be done by the owner of the contract

        if (address(currBallot) != 0x0 && currBallot.timeOut()) {
            // get winner
            address winner = currBallot.winningProposal();
            winLog(winner);
            // send to winner - but first make sure the address is valid
            if ( winner == 0x0){
```

Get ballot's address

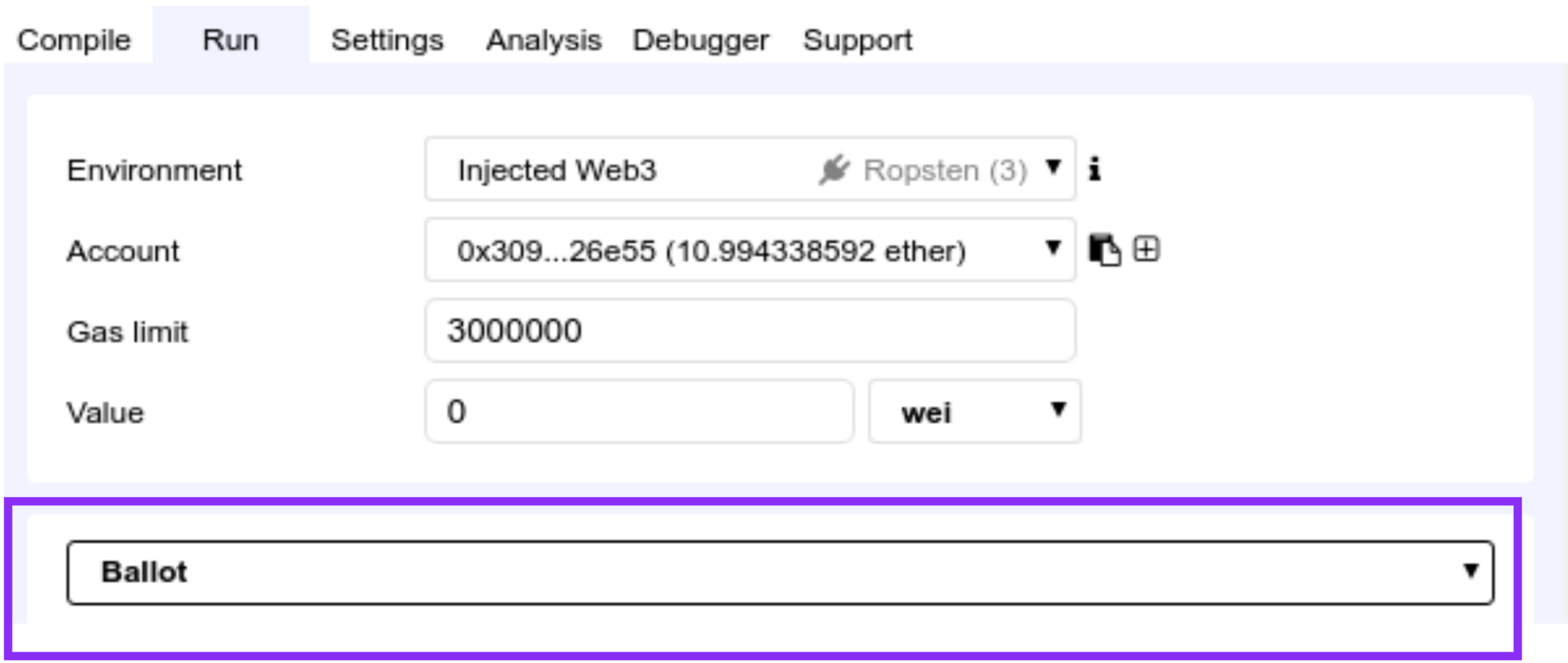
Execute currBallot call

Copy ballot's address

currBallot output

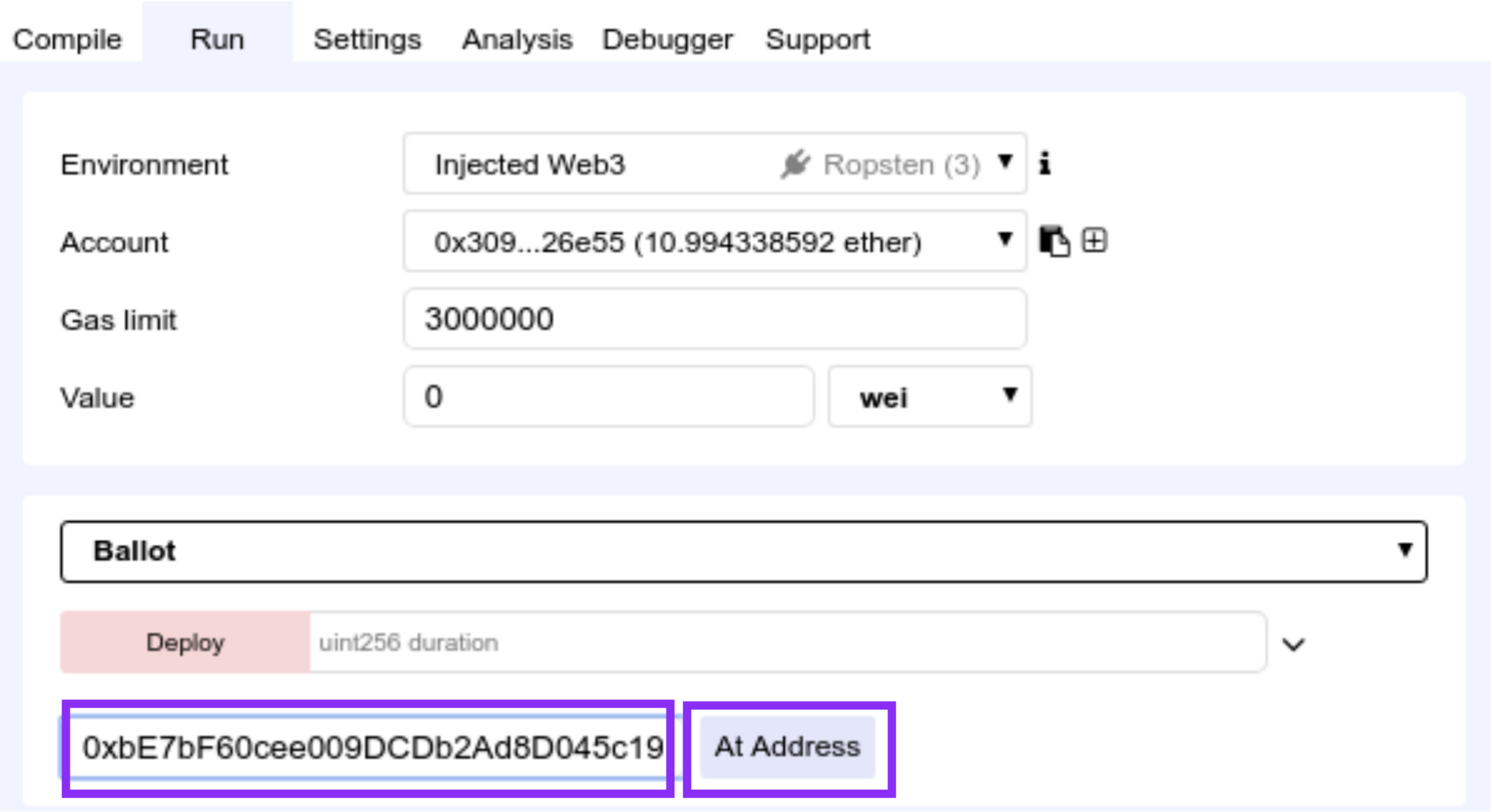
Switch to Ballot

Run tab: dropdown



Access Ballot contract

Paste address + click At Address



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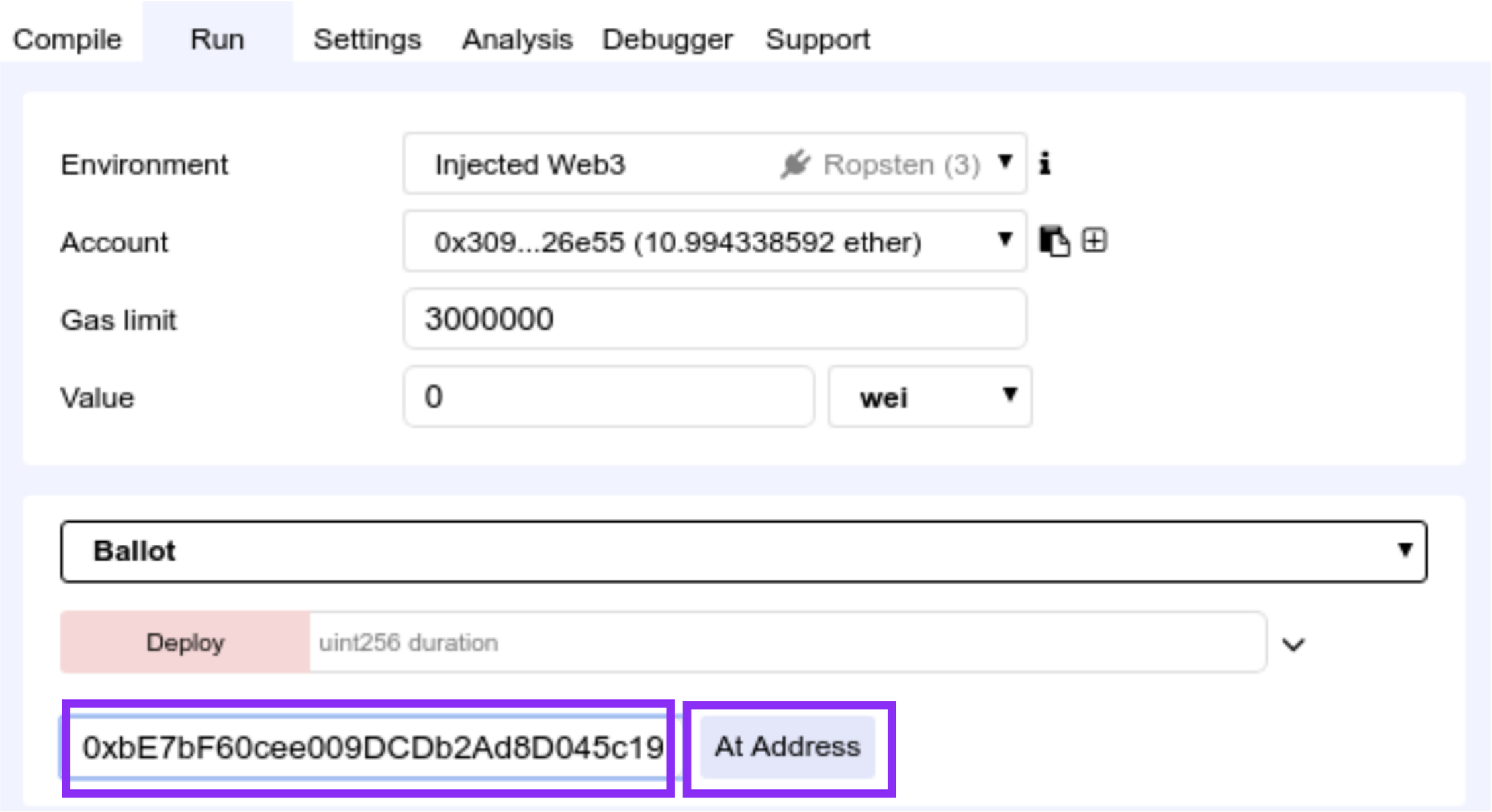
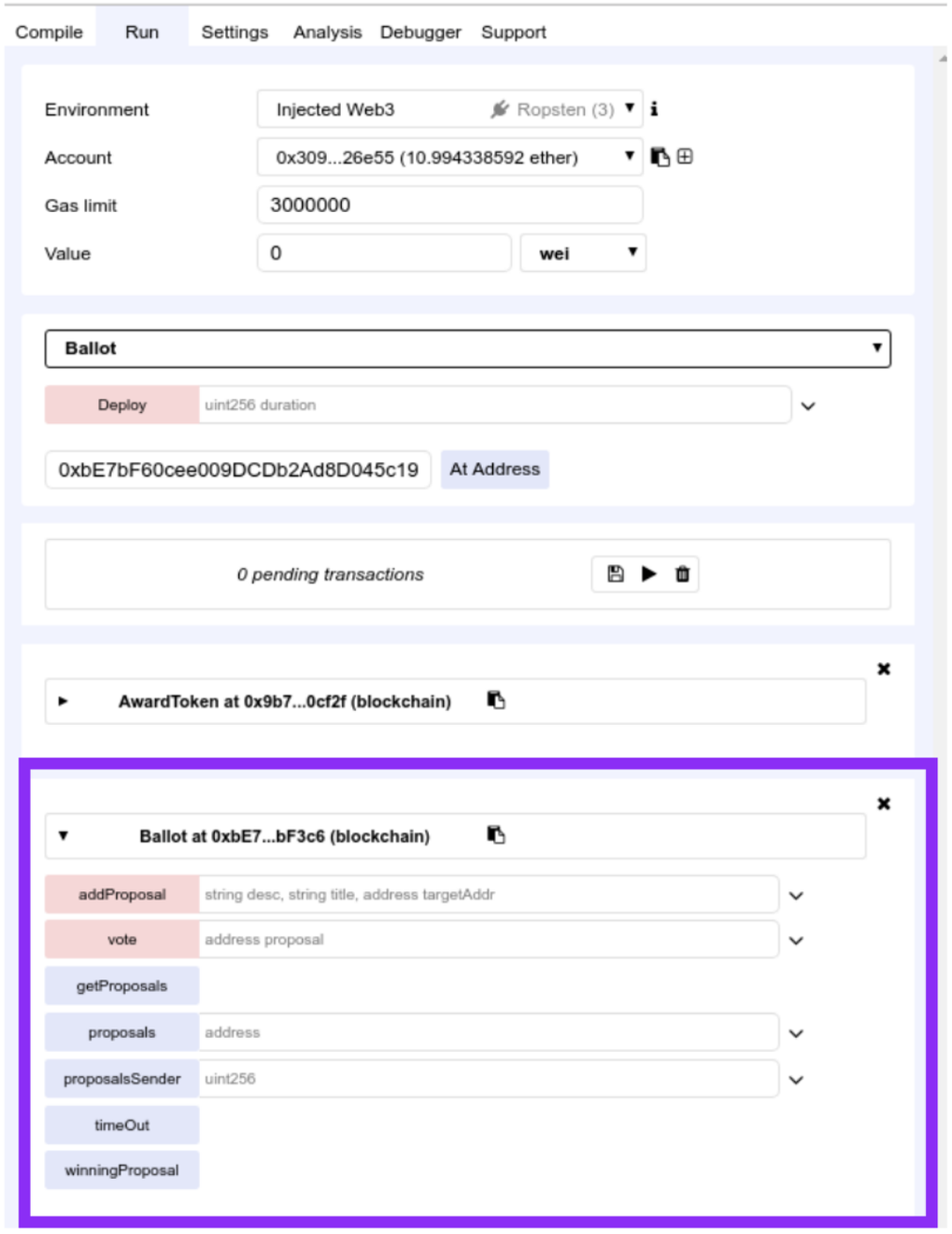


See autogenerated UI

(you might need to scroll down)

- Interact with all the functions in the contract
- And all the functions in the inherited contracts

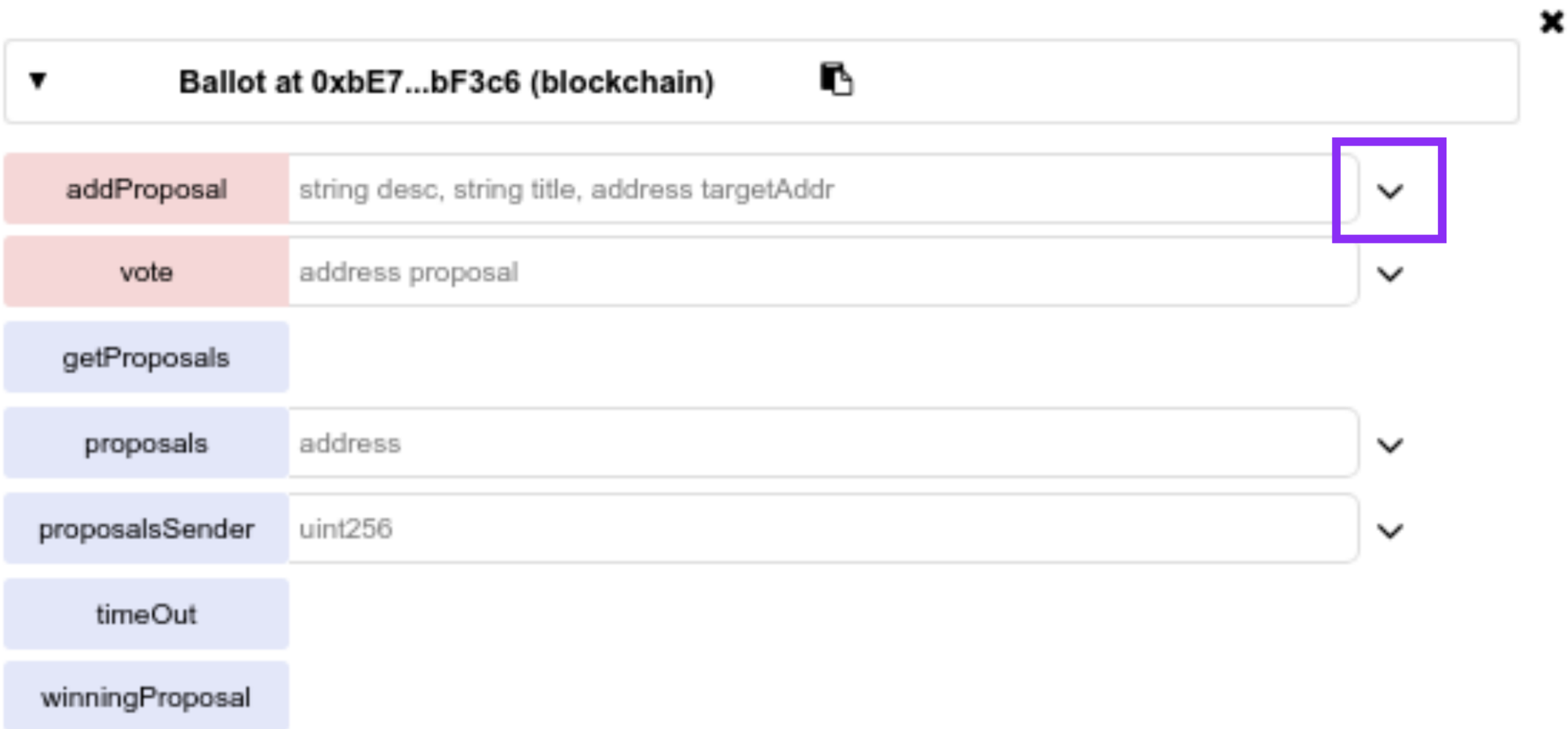


Part III

Adding a proposal and viewing the DAPP

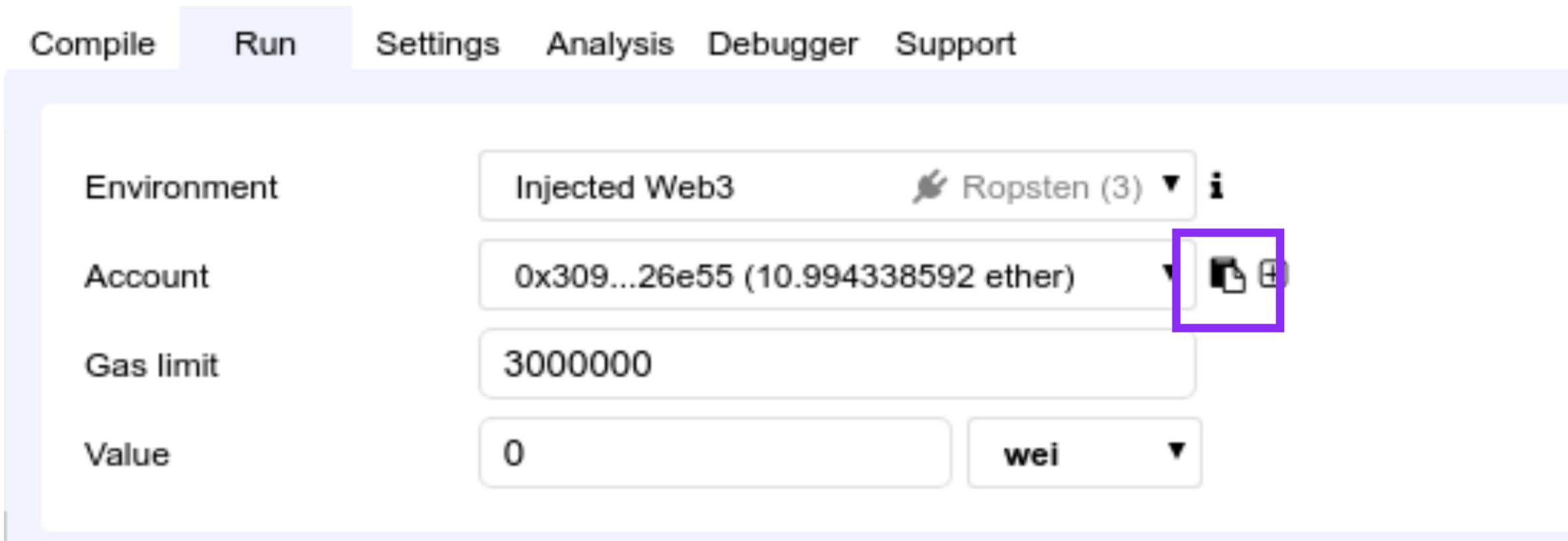
Add a new proposal

Expand addProposal function



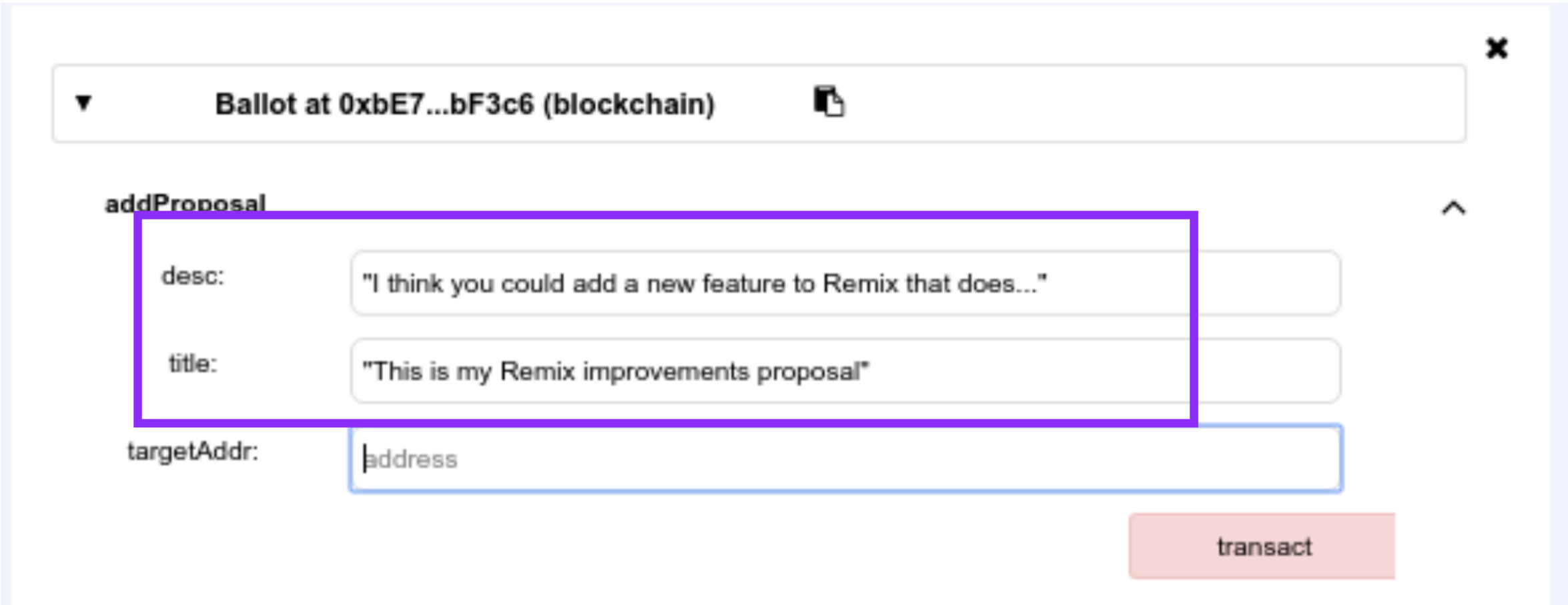
Copy your address

Run tab: Account



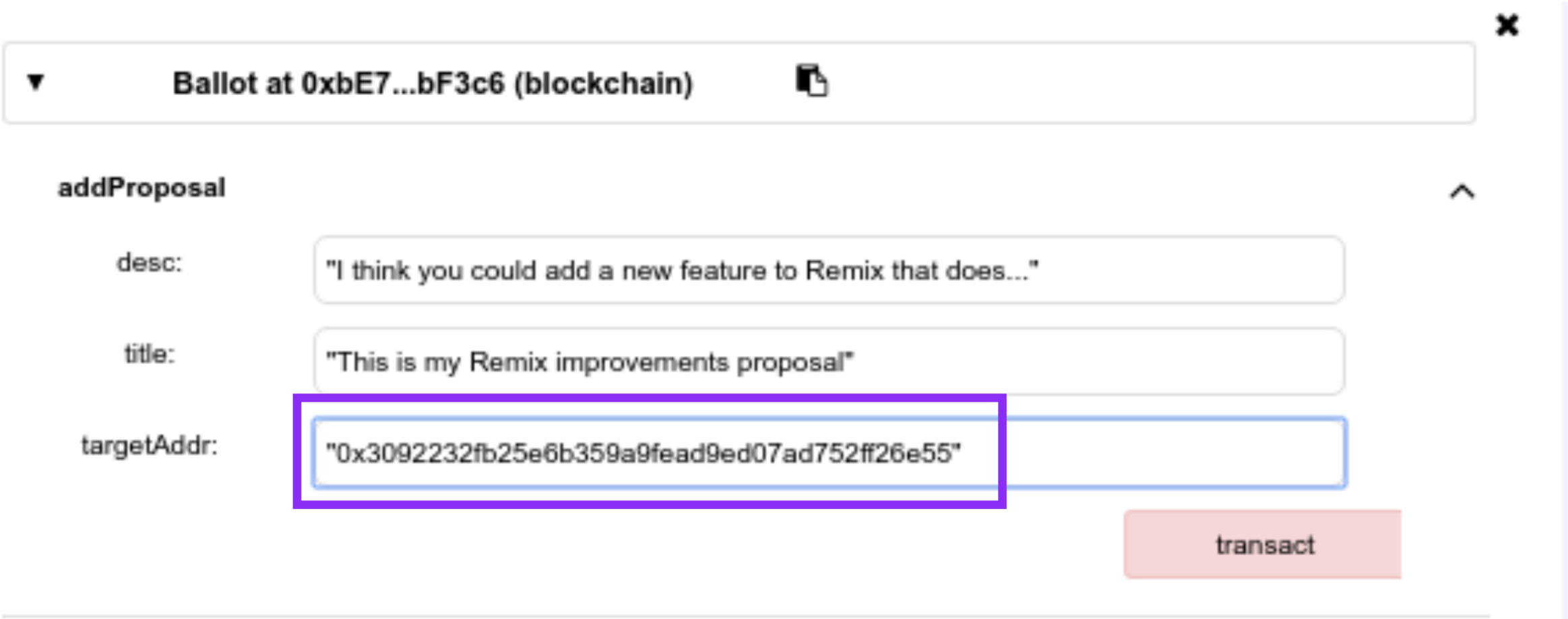
Type a proposal

Run tab: Account



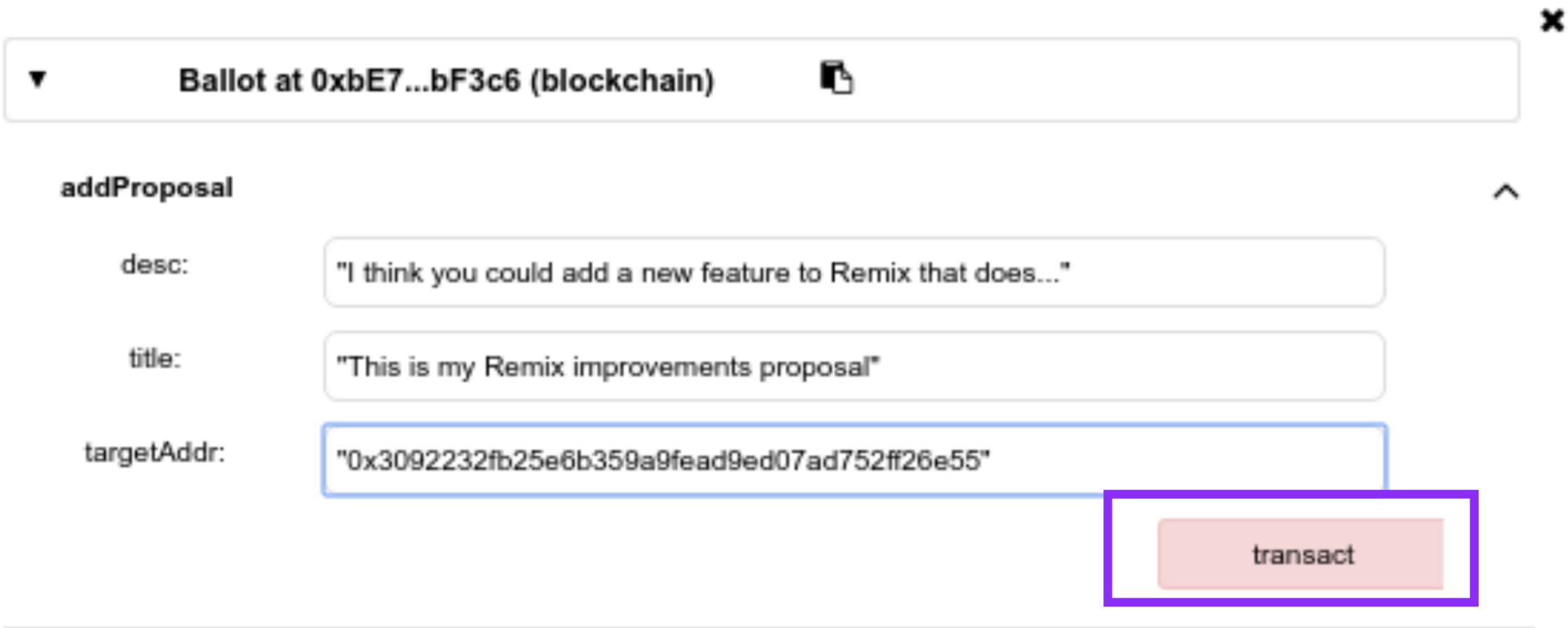
Add your address

Paste the address



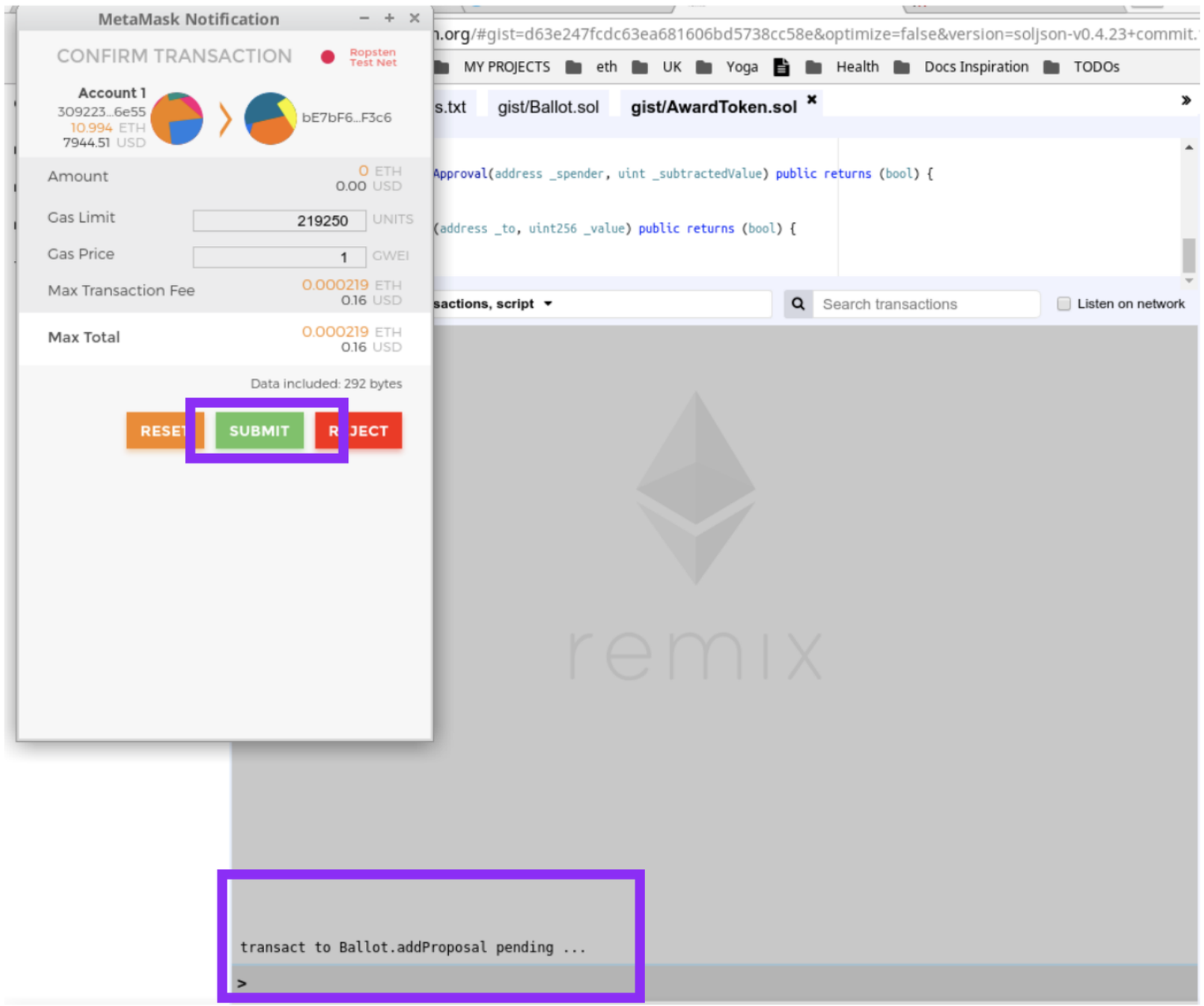
Execute addProposal

Hit the transact button



Confirm the transaction

Submit button



Check if tx succeeded

Terminal logs in Remix

```
transact to Ballot.addProposal pending ...

https://ropsten.etherscan.io/tx/0x82017ad20f4a74978f46662863b60f364a79092ef3f6aaa4f0add9696891d3dd

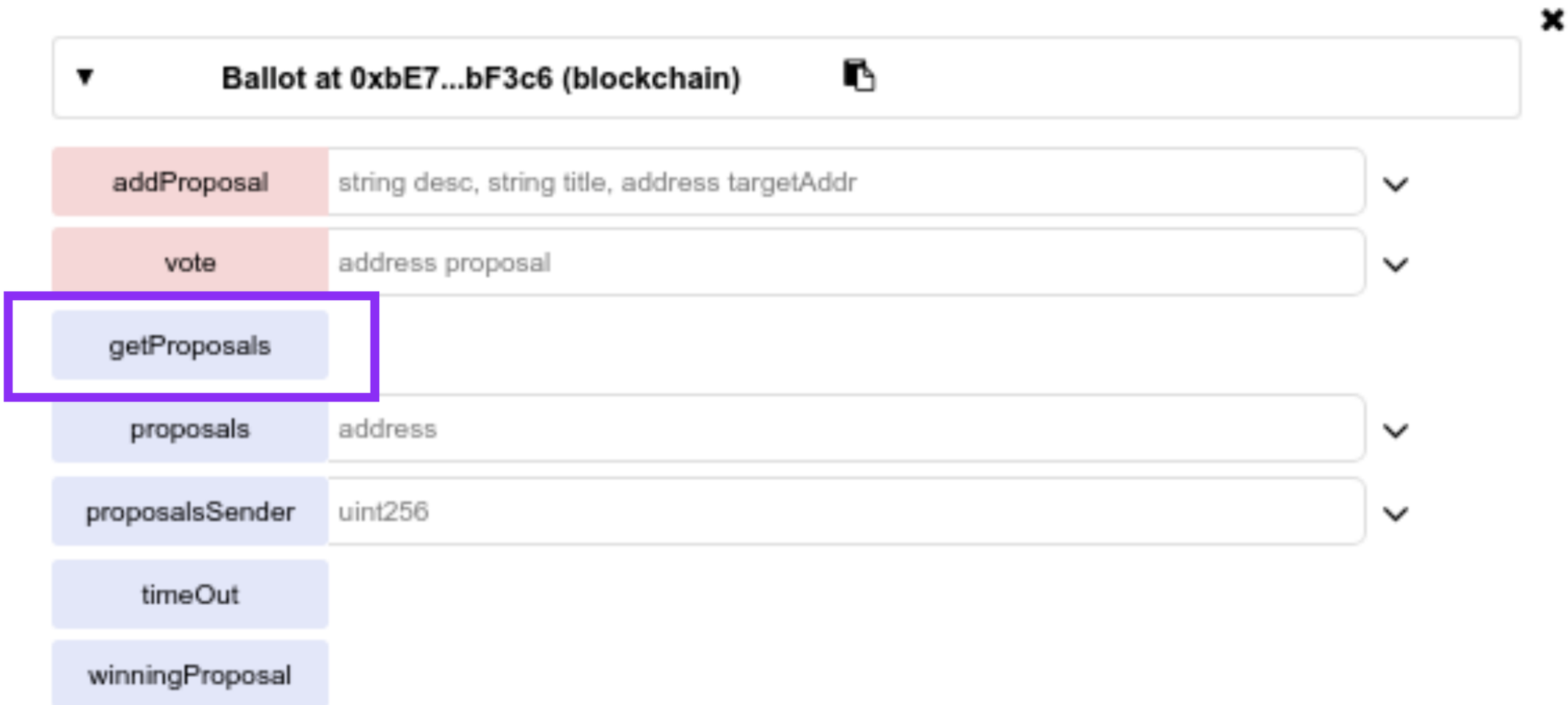
[block:3159638 txIndex:8]  from:0x309...26e55
to:Ballot.addProposal(string,string,address) 0xbe7...bf3c6 value:0 wei data:0x54c...00000 logs:0
hash:0x820...1d3dd
```

Debug

status	0x1 Transaction mined and execution succeed
from	0x3092232fb25e6b359a9fead9ed07ad752ff26e55
to	Ballot.addProposal(string,string,address) 0xbe7bf60cee009dcdb2ad8d045c19e76597bbf3c6
gas	219250 gas
transaction cost	219250 gas
input	0x54c496e1000000000000000000000000000000000000000000000000000000000000006000000000000000000000000000000000000000000000000000000000000000c0000000000000000000000003092232fb25e6b359a9fead9ed07ad752ff26e550000000000000000000000000000000000000000000000000000000000000039492074686 96e6b20796f7520636f756c64206164642061206e657720666561747572652074 6f2052656d697820746861742064 6f65732e2e2e000000000000000000000000000000000000000000000000000000000

Execute getProposals

getProposals call



See Proposals Addresses

well in so far there will only be 1 address

call to Ballot.getProposals

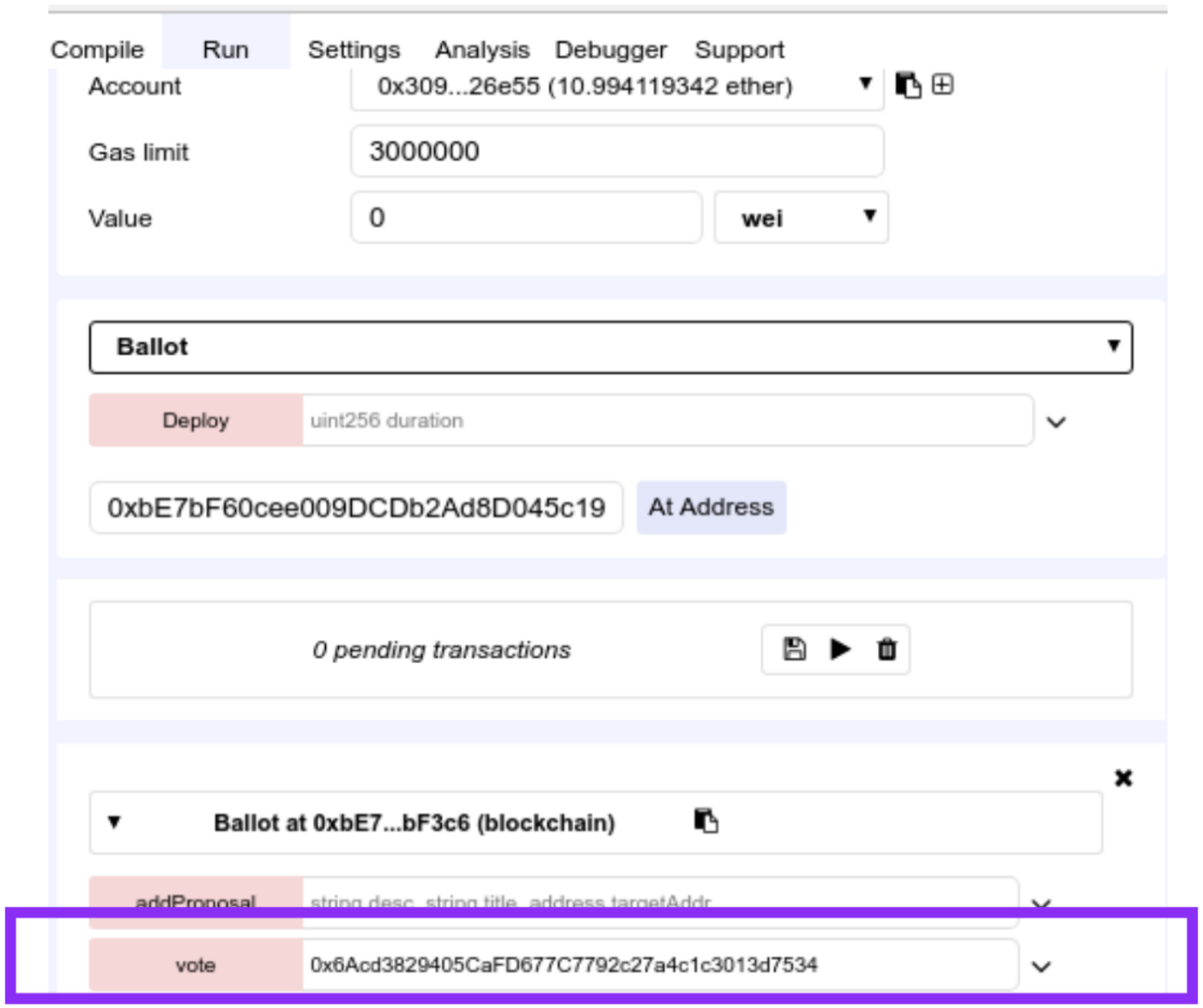
[call] **from:**0x3092232fb25e6b359a9fead9ed07ad752ff26e55 **to:**Ballot.getProposals()
data:0x625...64c48

Debug

from	0x3092232fb25e6b359a9fead9ed07ad752ff26e55
to	Ballot.getProposals() 0xbE7bF60cee009DCDb2Ad8D045c19e76597bbF3c6
input	0x62564c48
decoded input	{}
decoded output	{ "0": "address[]: 0x3092232FB25e6b359a9fEad9eD07Ad752Ff26e55,0xFd0f51afb685Cd8735AfE7685D21355589602b8c,0x6Acd3829405CaFD677C7792c27a4c1c3013d7534" }
logs	[]

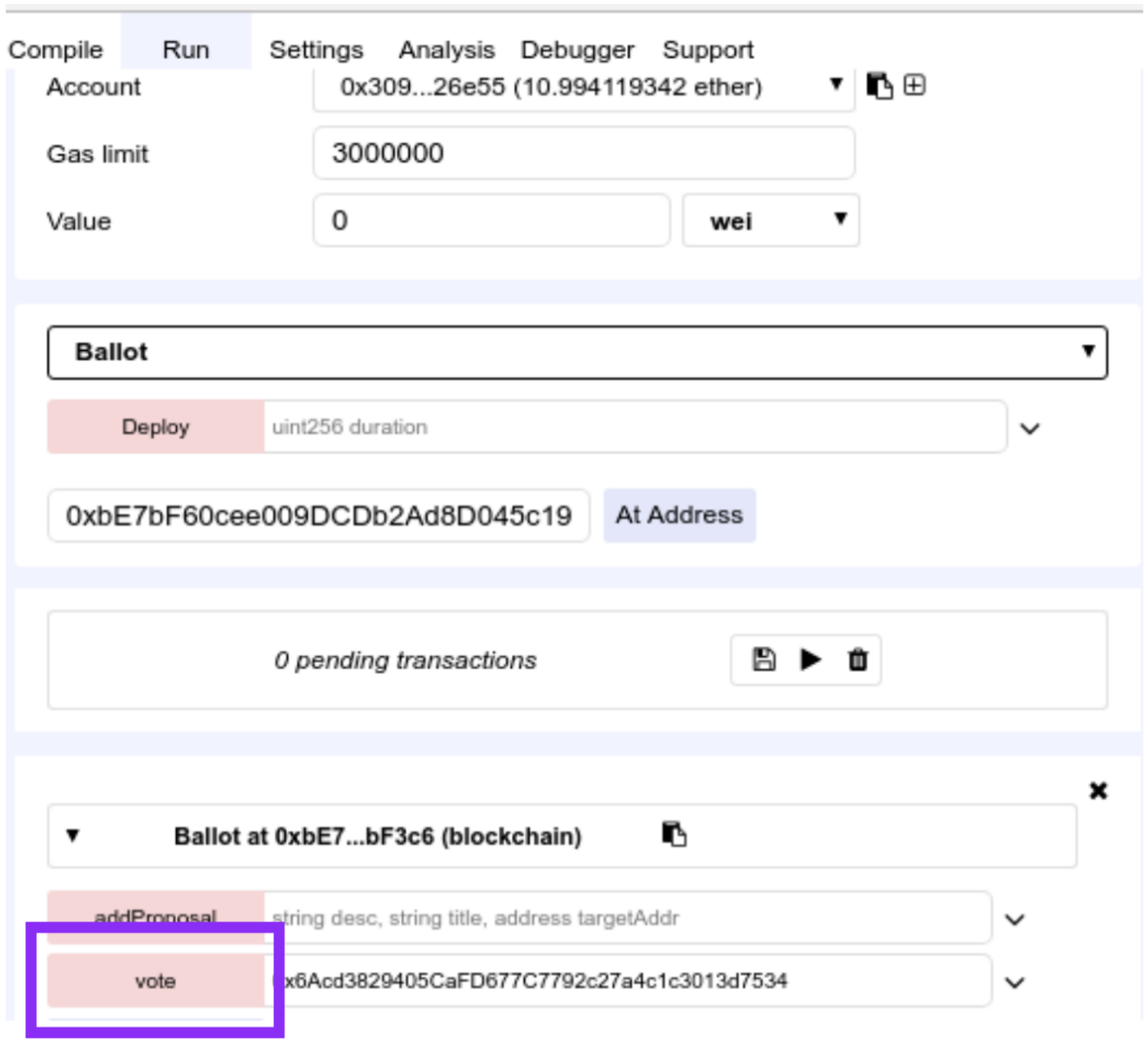
Vote for one Proposal

Paste Proposal Address you want to vote for



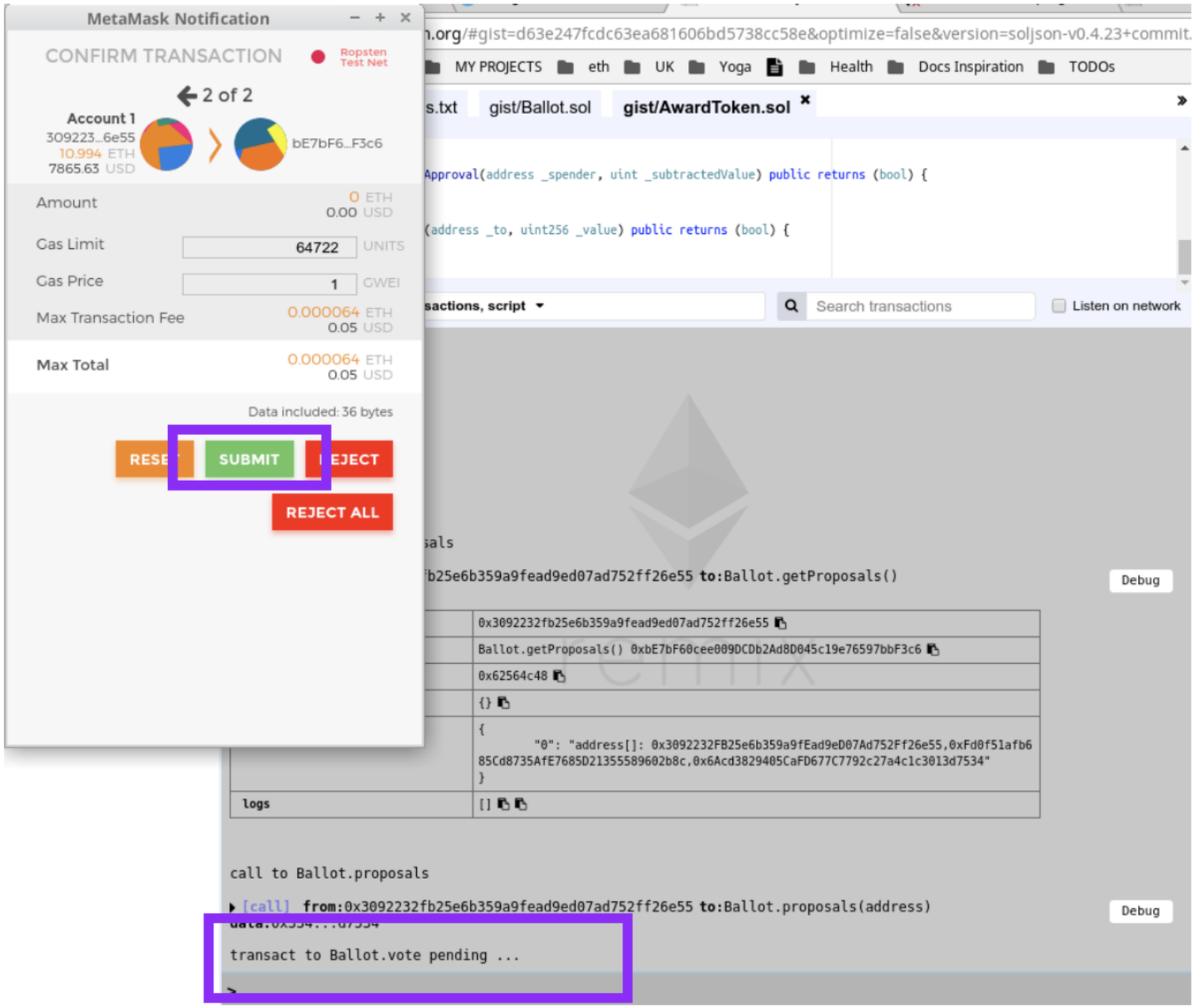
Execute vote transaction

vote button



Confirm the transaction

Submit button



Check if tx succeeded

Terminal logs in Remix

gist/dependencies.txt | gist/Ballot.sol | gist/AwardToken.sol

- browser
- config
- github
- gist
  - AwardToken.sol
  - Ballot.sol
  - TUTORIAL.md
  - dependencies.txt

```
63      }
64
65      function decreaseApproval(address _spender, uint _subtractedValue) public returns (bool) {
66          revert();
67      }
68
69      function transfer(address _to, uint256 _value) public returns (bool) {
70          revert();
71      }
72
73  }
```

[2] only remix transactions, script | Search transactions | Listen on network

call to Ballot.getProposals

[call] **from:**0x3092232fb25e6b359a9fead9ed07ad752ff26e55 **to:**Ballot.getProposals() Debug
data:0x625...64c48

from	0x3092232fb25e6b359a9fead9ed07ad752ff26e55
to	Ballot.getProposals() 0xbE7bF60cee009DCDb2Ad8D045c19e76597bbF3c6
input	0x62564c48
decoded input	{}
decoded output	{ "0": "address[]: 0x3092232FB25e6b359a9fEad9eD07Ad752Ff26e55,0xFd0f51afb685Cd8735AfE7685D21355589602b8c,0x6Acd3829405CaFD677C7792c27a4c1c3013d7534" }
logs	[]

call to Ballot.proposals

[call] **from:**0x3092232fb25e6b359a9fead9ed07ad752ff26e55 **to:**Ballot.proposals(address) Debug
data:0x334...d7534

transact to Ballot.vote pending ...

[block:3159861 txIndex:27] **from:**0x309...26e55 **to:**Ballot.vote(address) 0xbe7...bf3c6 **value:**0 wei Debug
data:0x6dd...d7534 **logs:**0 **hash:**0xe0d...6c6eb

Now let's try it out connecting a frontend

http://bit.ly/remix-voting

(when dependencies.js is the active file)

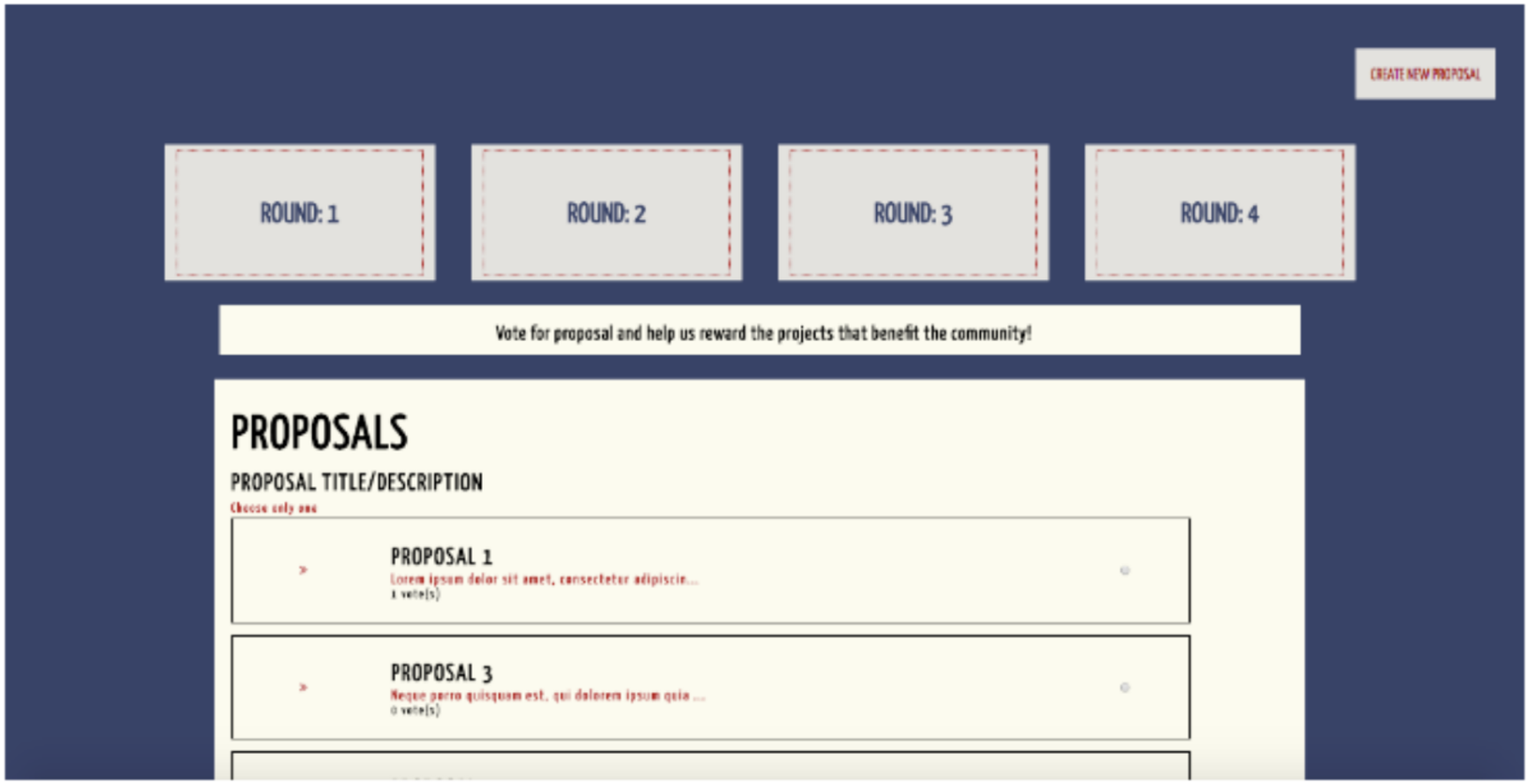
To access our Award Token from this frontend - you need the address of the Award Token.

Go to ethereum/remix-workshop to access the award token I just deployed

```
contract Ballot {

    uint _duration;
    uint _startTime;
    struct Proposal {
        string description;
        string title;
        uint voteCount;
```

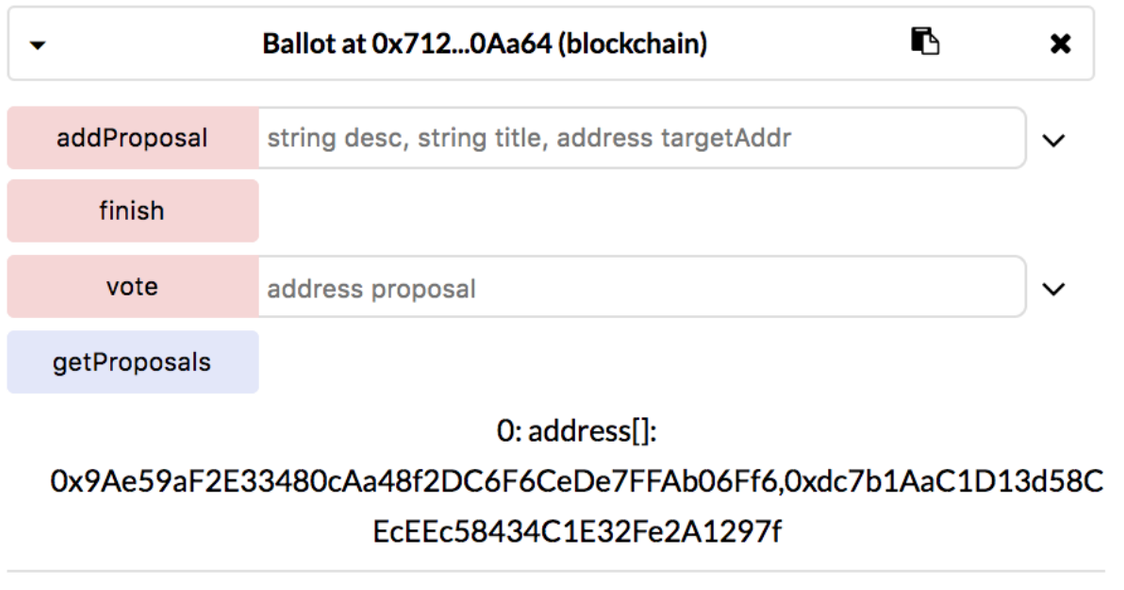
```
contract AwardToken is MintableToken {
    uint quantity;
    uint ballotPeriod = 7 hours;
    Ballot public currBallot;
    address[] public prevWinners;
```



Let's check results

http://bit.ly/remix-voting

Check the state of the contract



2 proposals have been added

Thank you

@ninabreznik @ryestew @yann300
@serapath @LianaHus @iurimatias

http://bit.ly/remix-workshop-repository