Connecting our Ethereum private blockchain and interacting with it.

Tools:

1. A private blockchain: Setup and provided by the university.
2. MetaMask: Wallet.
3. Remix Ethereum: Online Solidity compiler.

Outline

- We show how to connect to our private blockchain and interact with it.
- Steps:

1. Install MetaMask. Create an account (i.e. an address and public-private key) via MetaMask.

2. Send us your account address, so we can give you some Ether.

3. Get familiar with Solidity and the Remix compiler:

   - Write smart contracts, debug and compile them online.

4. Send/deploy the latest version of the contract to the blockchain and interact with the deployed contract.

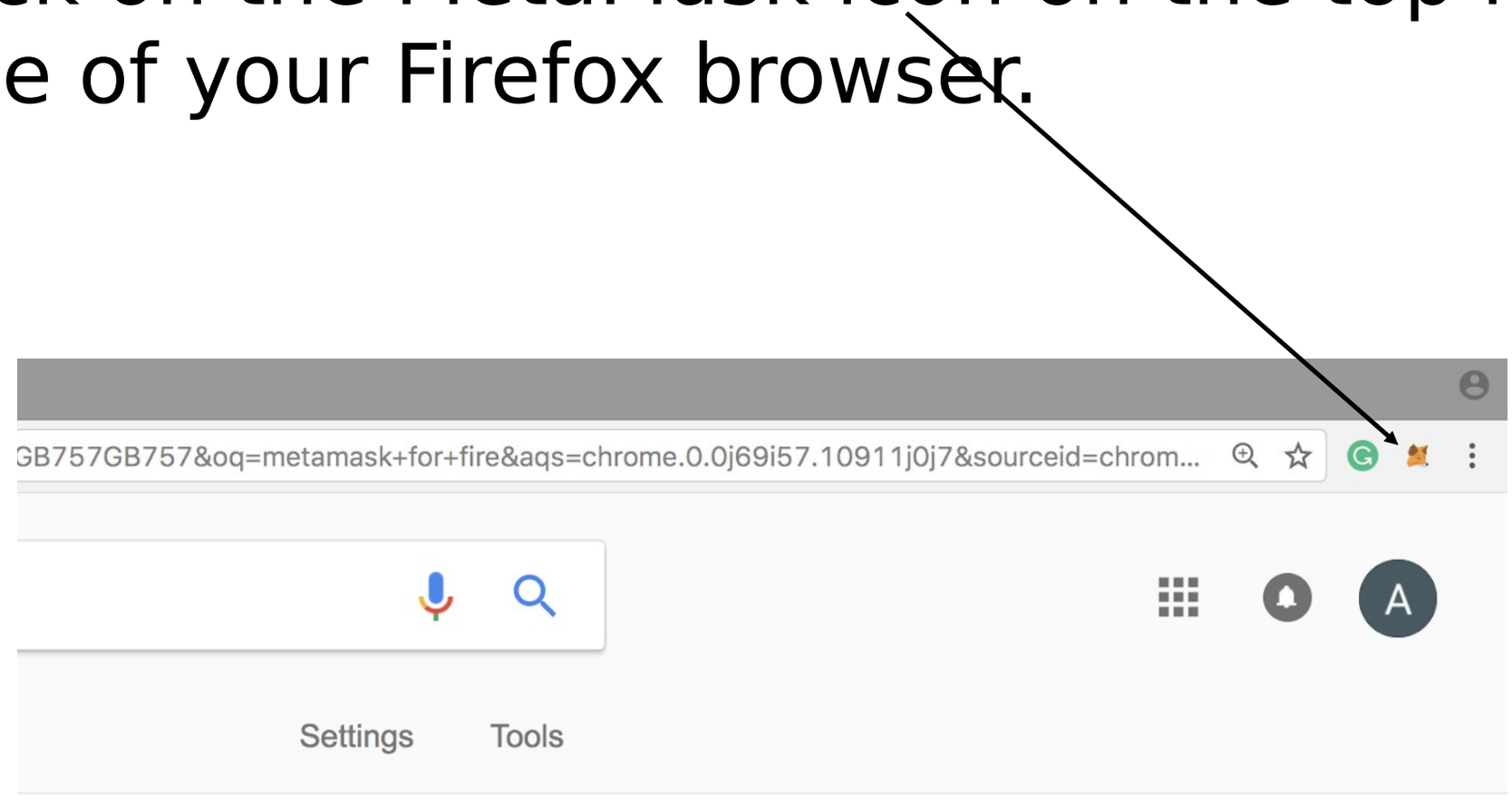
Step 1:
Install Metamask

- It is an extension for Firefox and Google Chrome.
- Allows us to create our public/private keys and connect to the blockchain.
- We recommend using MetaMask for Firefox or Chrome
  - Download it from:

    https://metamask.io/
- Follow the instructions to install it.

Step1.1:
Set Up an Account in MetaMask

- Click on the MetaMask icon on the top right side of your Firefox browser.



Step1.2: Create an Account in MetaMask

- Follow the instructions to create an account.

- After you provide a password, an account (i.e. an address, public and secret keys) will be created for you.

- **Store your seed**: you want it to restore your wallet in case you delete Metamask

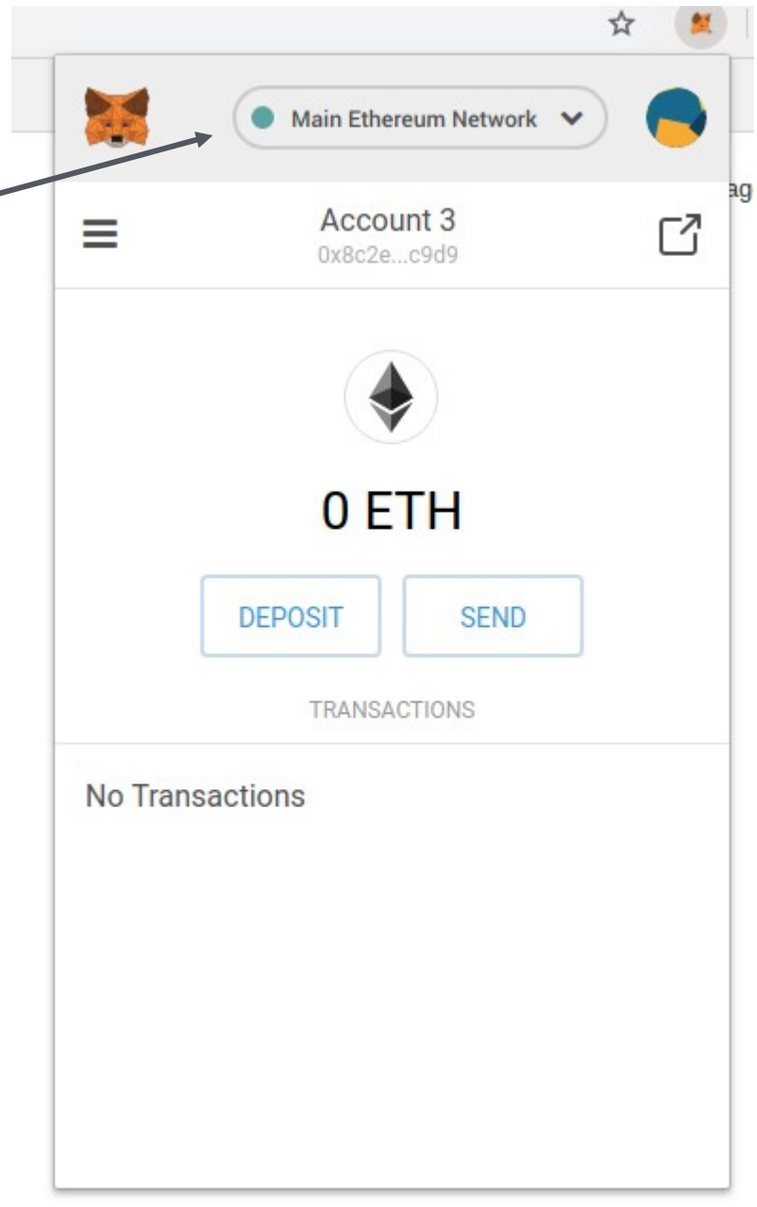
Step1.3:

Connect MetaMask to the Private Blockchain

3.1. Click the MetaMask icon.

3.2. Click on the Network option

3.3. Click on “Custom RPC”



Step1.3:

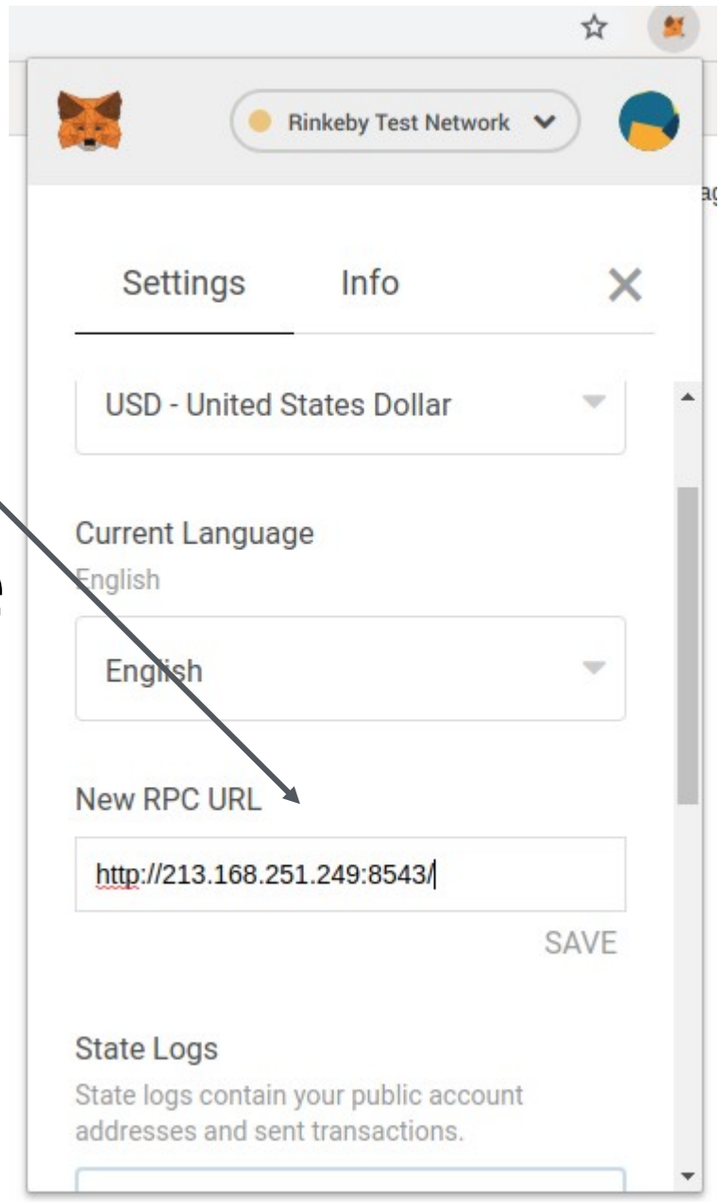
Connect MetaMask to the Private Blockchain

3.1. In the box on the top, insert the following link:

http://213.168.251.249:8543/

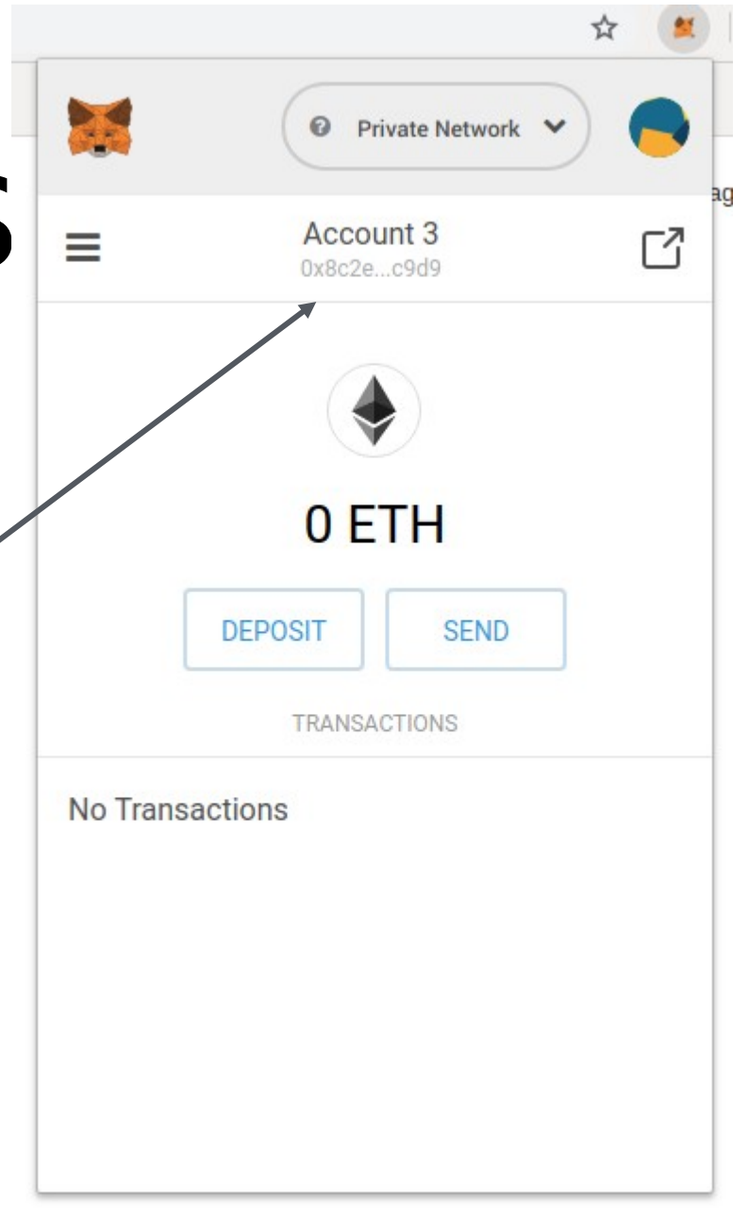
3.2. Click on Save to save it.

3.3. Press X to go to the main page



Step1.3: Your Address

- When you've successfully connected to the chain, this page will appear.



- This is your address; click on it to copy and send it to those who want to pay you.

Step 2:
Send us Your Account Address

- You need some Ether to send a transaction and interact with a smart contract.

- We have created a lot of Ether - you can also have some.

- Request some Ether by sending your account’s address to this email address:

dimitris.karakostas@ed.ac.uk

Step 3:
Getting Familiar with Remix Ethereum:
Online Solidity Compiler

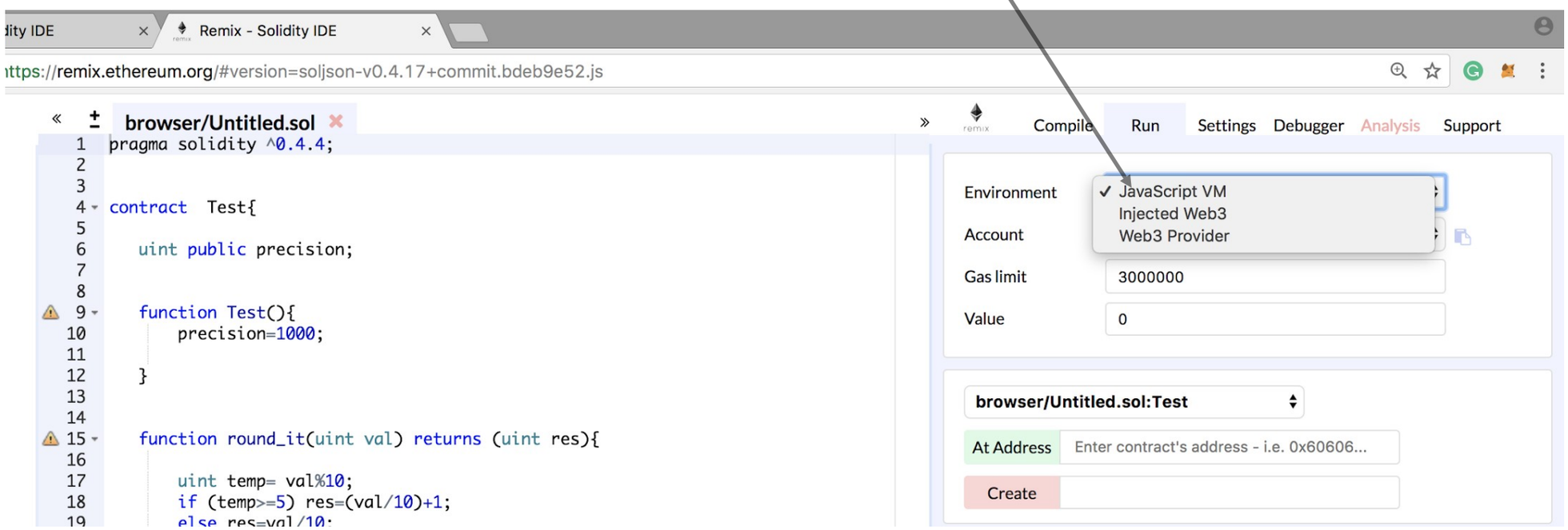
- You can write, debug, deploy (i.e. send to a blockchain) your smart contract via remix Ethereum: remix.ethereum.org

  (If you are using Chrome, it is possible that an error message appears when you load Remix – you can ignore it and then compile your smart contracts as usual, or use Mozilla Firefox instead

- Also, you can interact with your deployed contract using Remix.

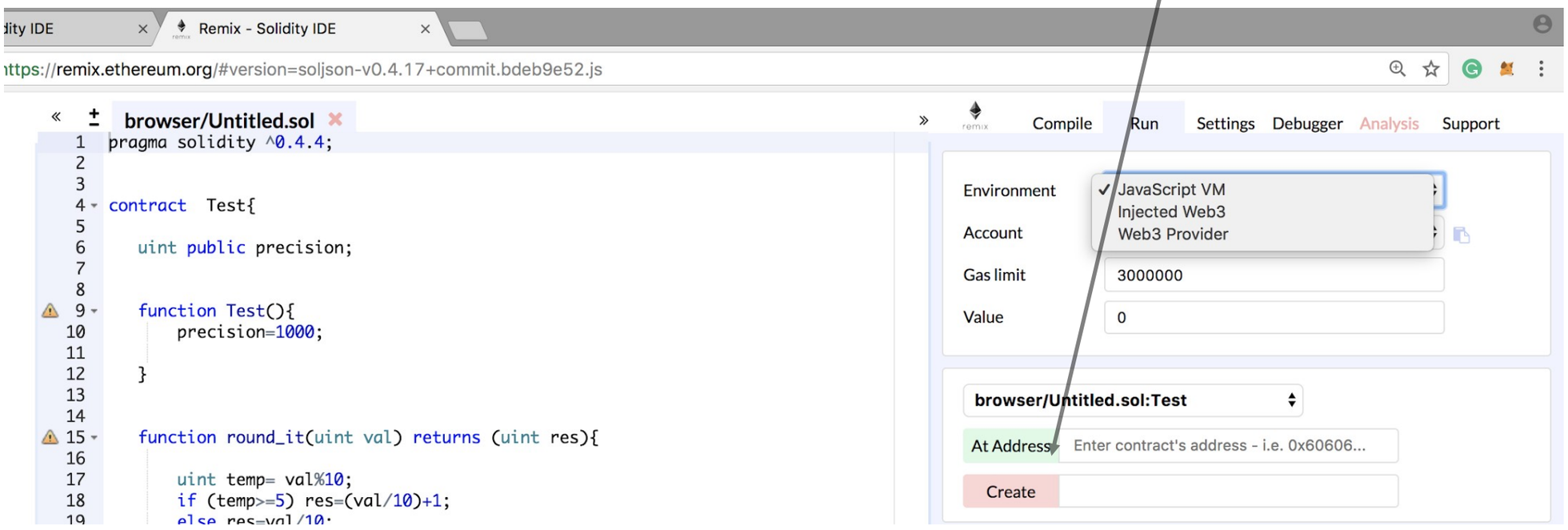
Step 3:
Getting familiar with Remix Ethereum:
Online Solidity Compiler

- Before you deploy your smart contract to the private chain, run and debug it online.
- In the case where you want to run it online, you should set environment to: JavaScript VM.



Step 3:
Getting familiar with Remix Ethereum:
Online Solidity Compiler

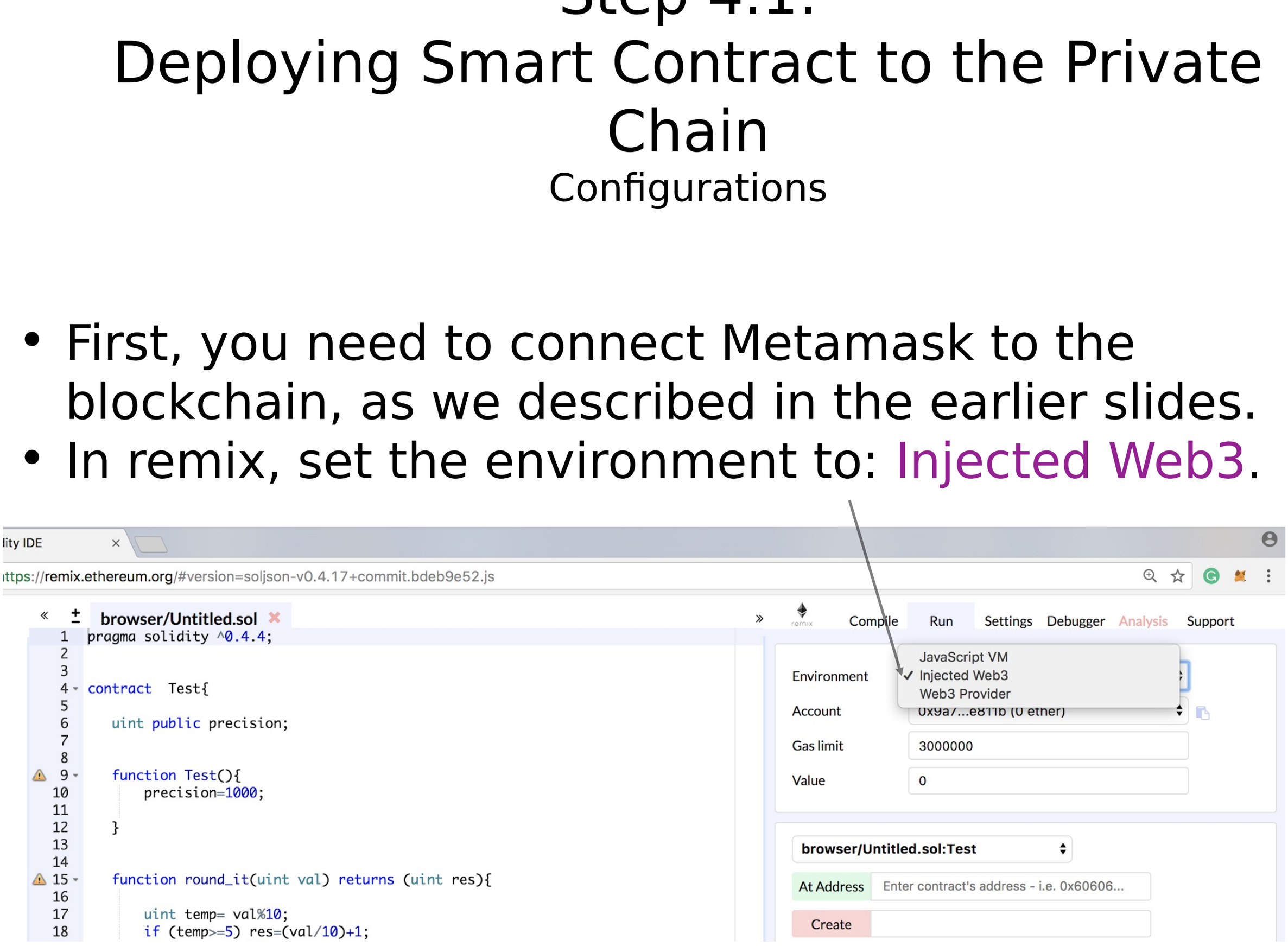
- To compile your smart contract, click on Create button.
- After compiling the contract, remix creates a user interface for the functions you defined in the contract and you can pass parameters to it.



Step 4.1:
Deploying Smart Contract to the Private Chain

Configurations

- First, you need to connect Metamask to the blockchain, as we described in the earlier slides.
- In remix, set the environment to: Injected Web3.

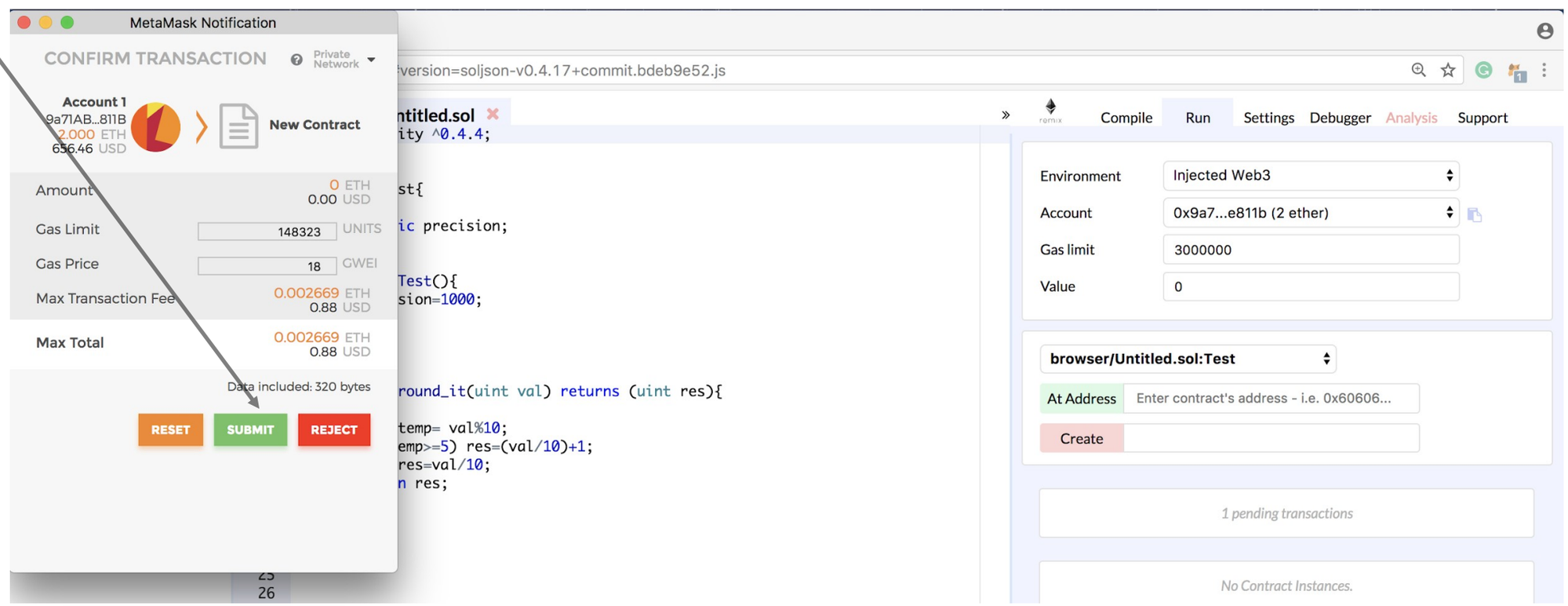


Step 4.2:
Deploying Smart Contract to the Private Chain

Deploying a Contract to the Blockchain

- Click on Create button.

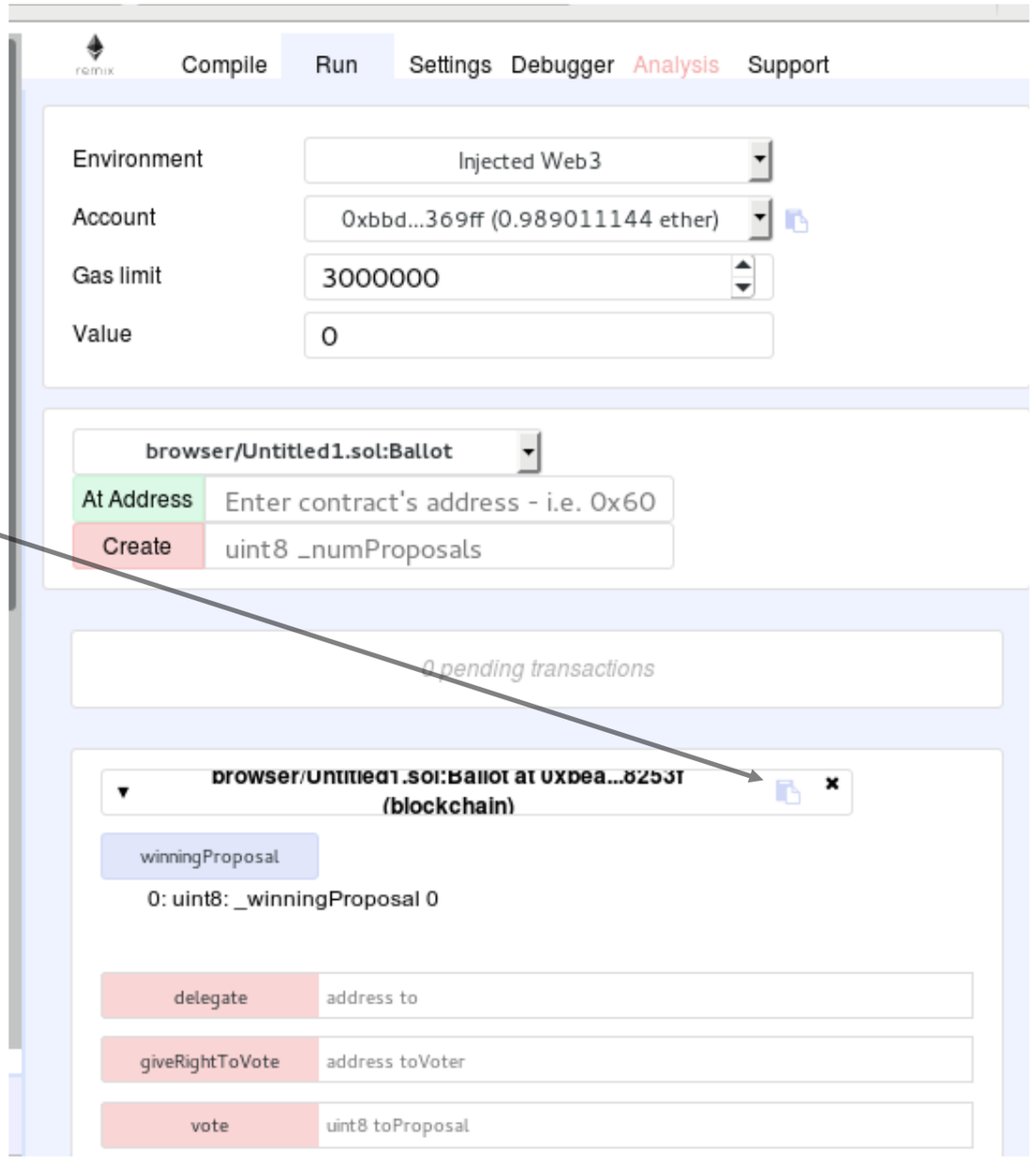
- Next, MetaMask page will appear and by clicking on submit, you send your contract to the blockchain.



Step 4.3:
Deploying Smart Contract to the Private Chain

Saving the Deployed Contract's Address

- When, your contract is successfully submitted/deployed, remix provides the contract address on the blockchain.
  - You can copy the address from here.
- You need the contract code and the address next time you want to interact with your deployed contract.

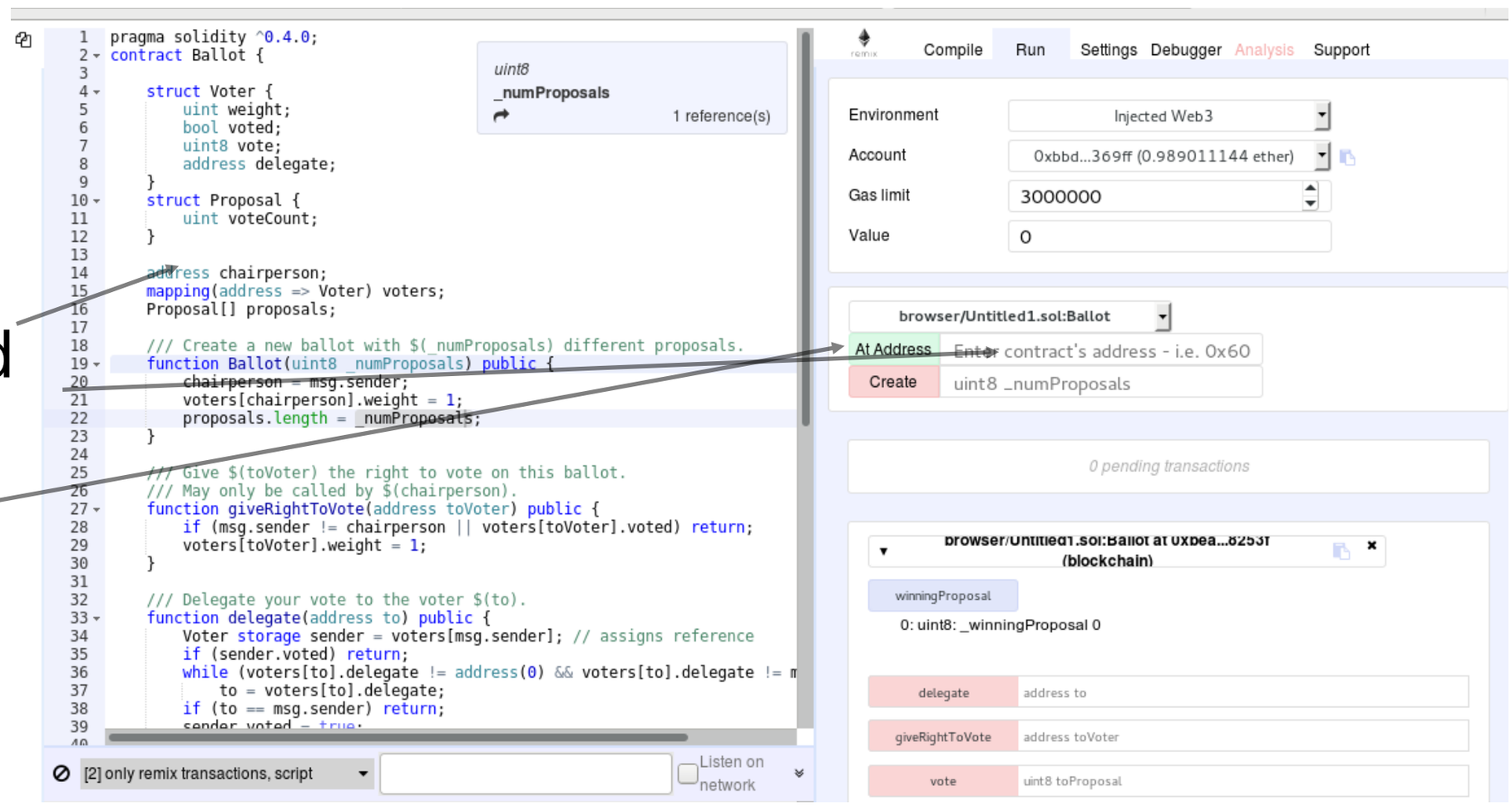


Step 4.3:
Deploying Smart Contract to the Private Chain

Interacting with a Deployed Contract

1. Log in to MetaMask and connect to the blockchain (as previously explained)
2. In remix, set the environment to: Injected Web3.

3. In remix, insert the contract code, insert the deployed contract's address and click on: At Address.



Step 4.3:
Deploying Smart Contract to the Private Chain

Interacting with a Deployed Contract

4- All the public/external functions in the contract are provided and you can pass arguments on them and invoke them.

- The invocation of a function, that changes the contract state, will result in new transaction.