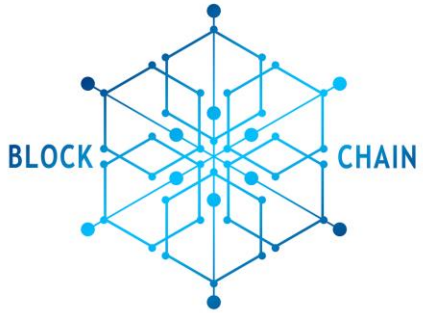


Blockchain Implementation

Presented by: Masoud Barati
November 2019

Implementation of smart contracts in Ethereum

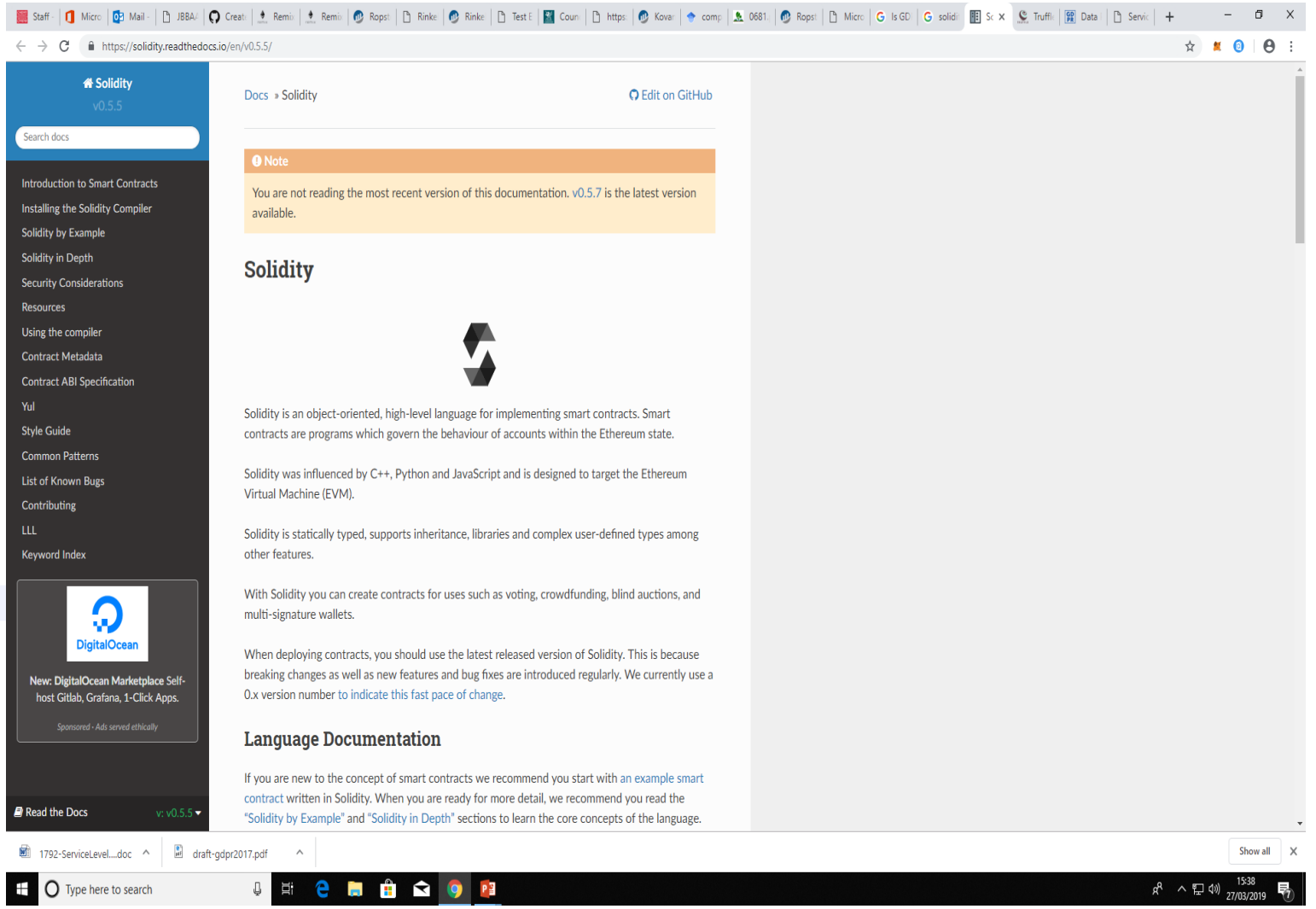
ethereum

Solidity

https://solidity.readthedocs.io/en/v0.5.5/

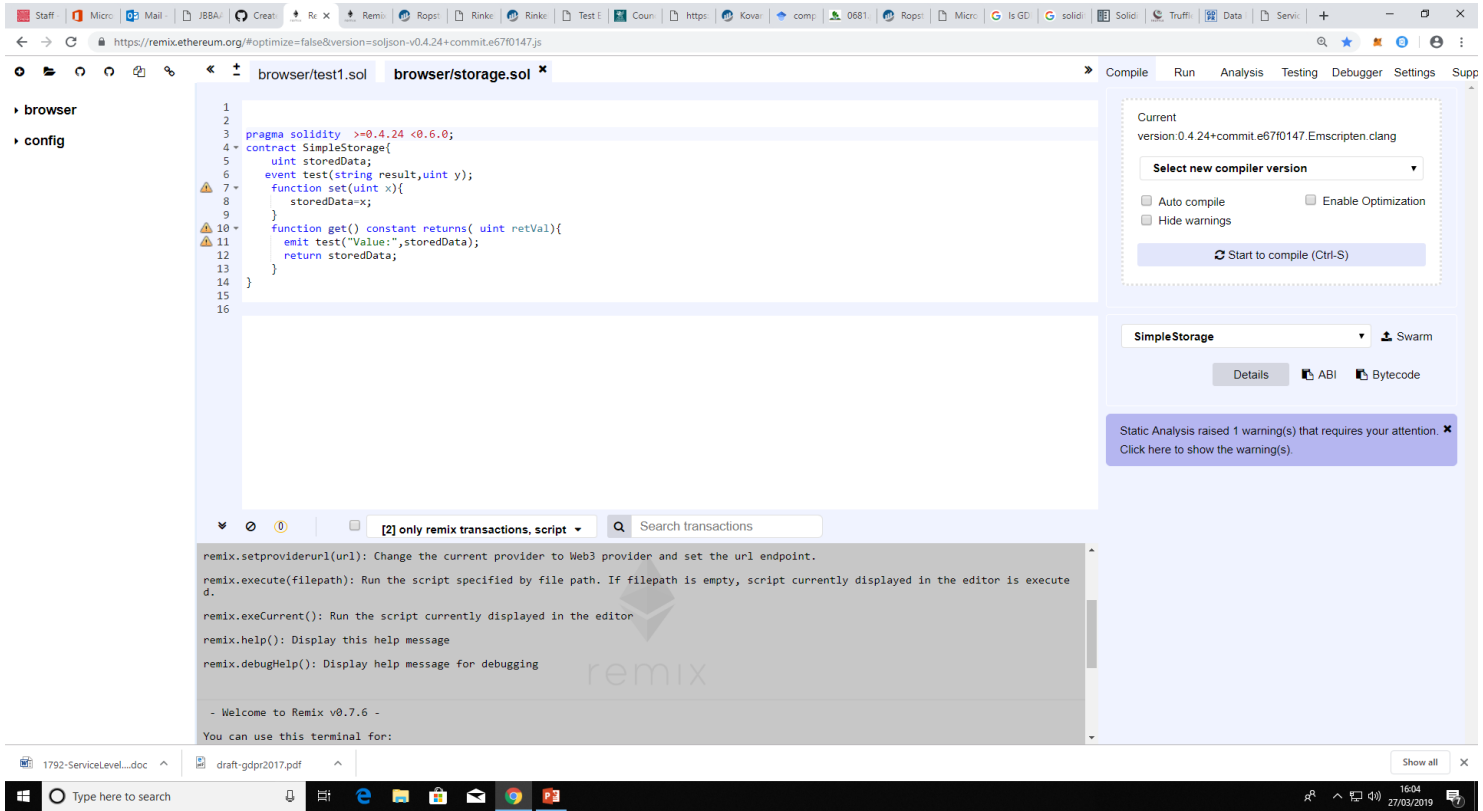
- **Solidity**: is an object-oriented, high-level language for implementing smart contracts

```
contract SimpleStorage {
    uint storedData;

    function set(uint x) {
        storedData = x;
    }

    function get() constant returns (uint retVal) {
        return storedData;
    }
}
```

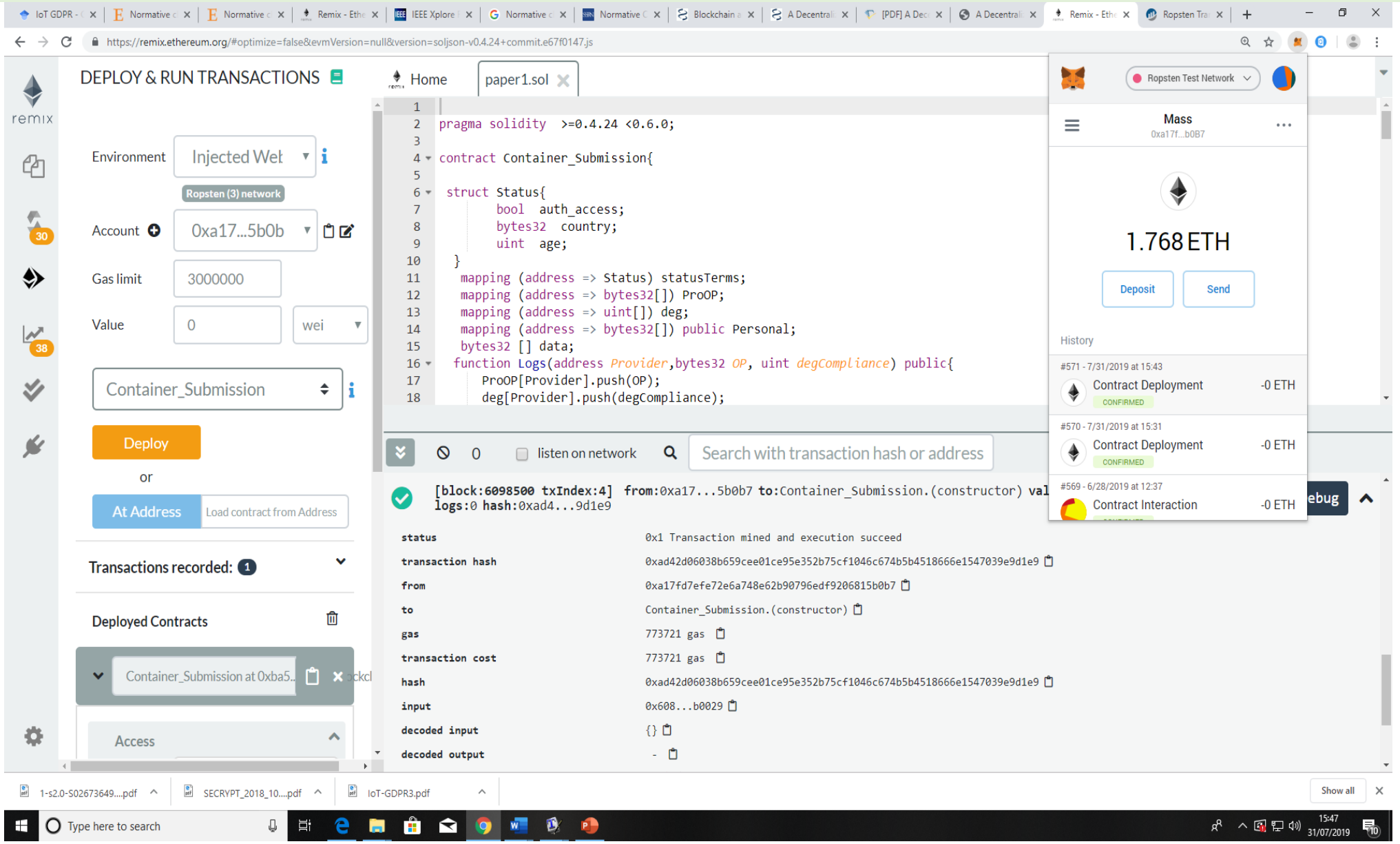


Implementation environment

- **Ethereum blockchain**: is a public and permissionless blockchain supporting smart contracts
- **Remix-IDE Ethereum**: is a browser-based compilers that test and analysed deployed smart contracts



Remix-IDE environment



From Solidity to deployment in test network

Write smart contracts by Solidity

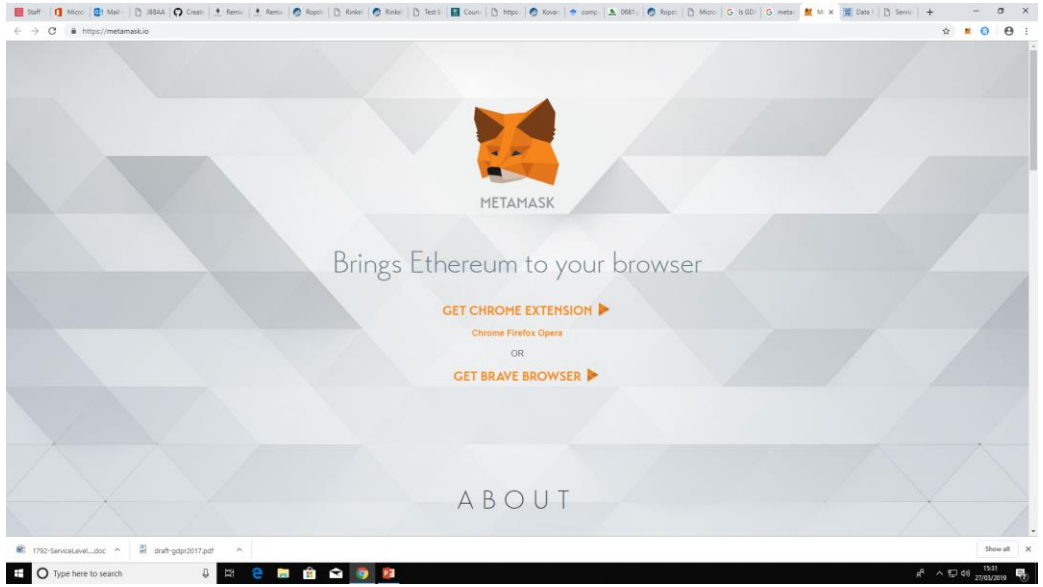
Compile by Remix-IDE

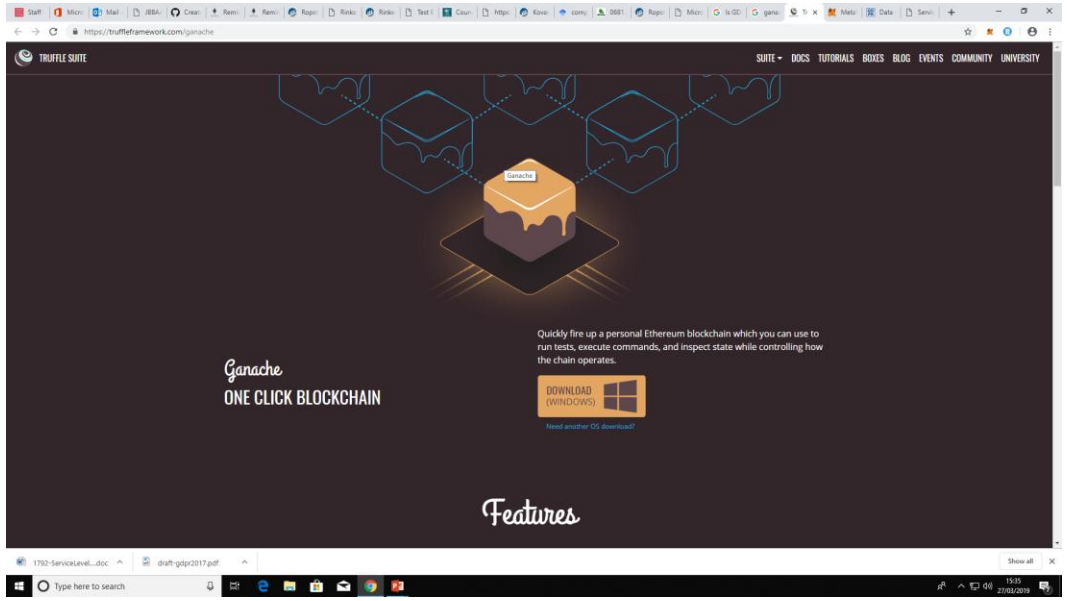
Deploy on test networks

- Ropsten
- RPC
- Kovan
- Rinkeby
- Ganache

MetaMask
https://matamask.io

https://truffleframework.com/ganache



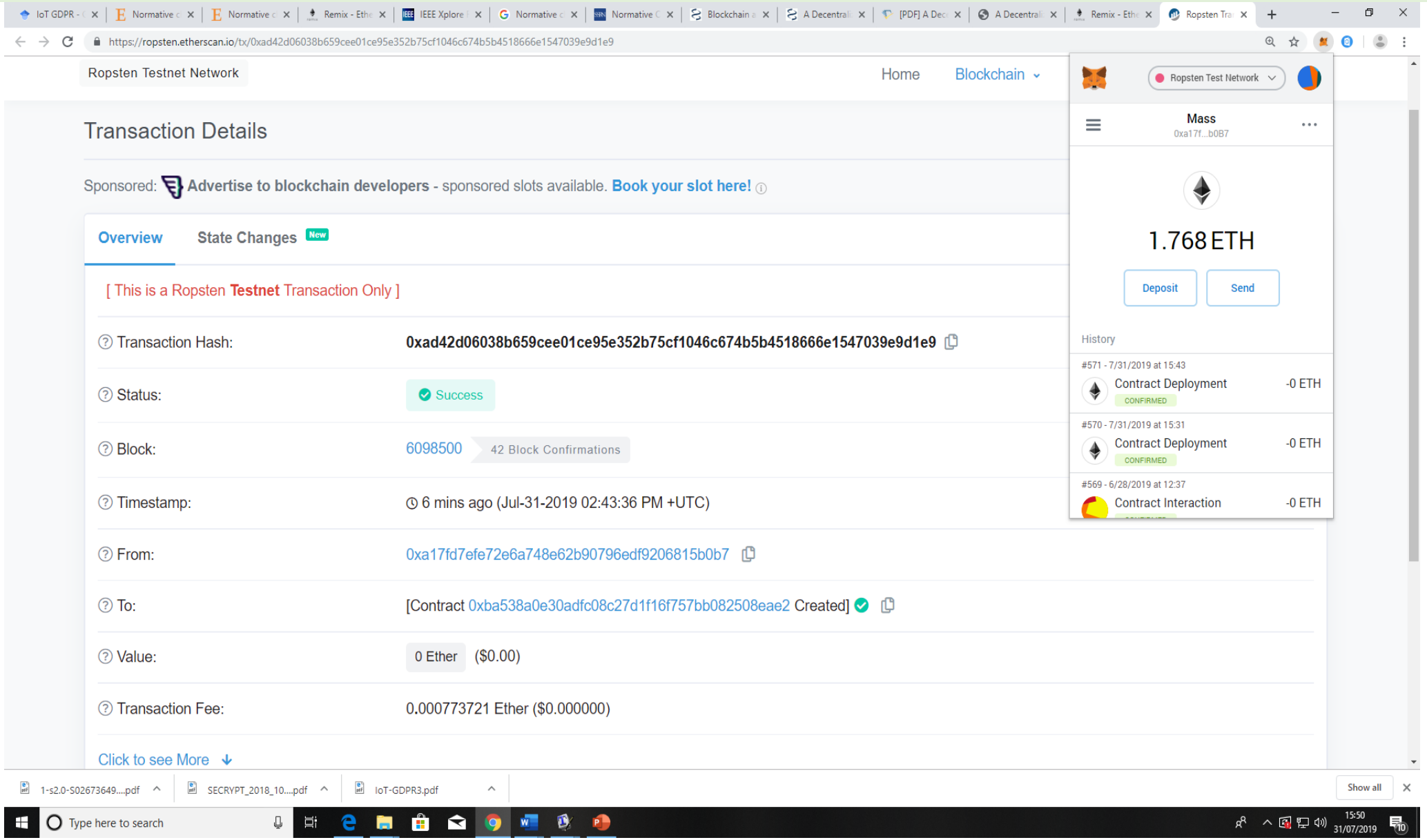


Test network

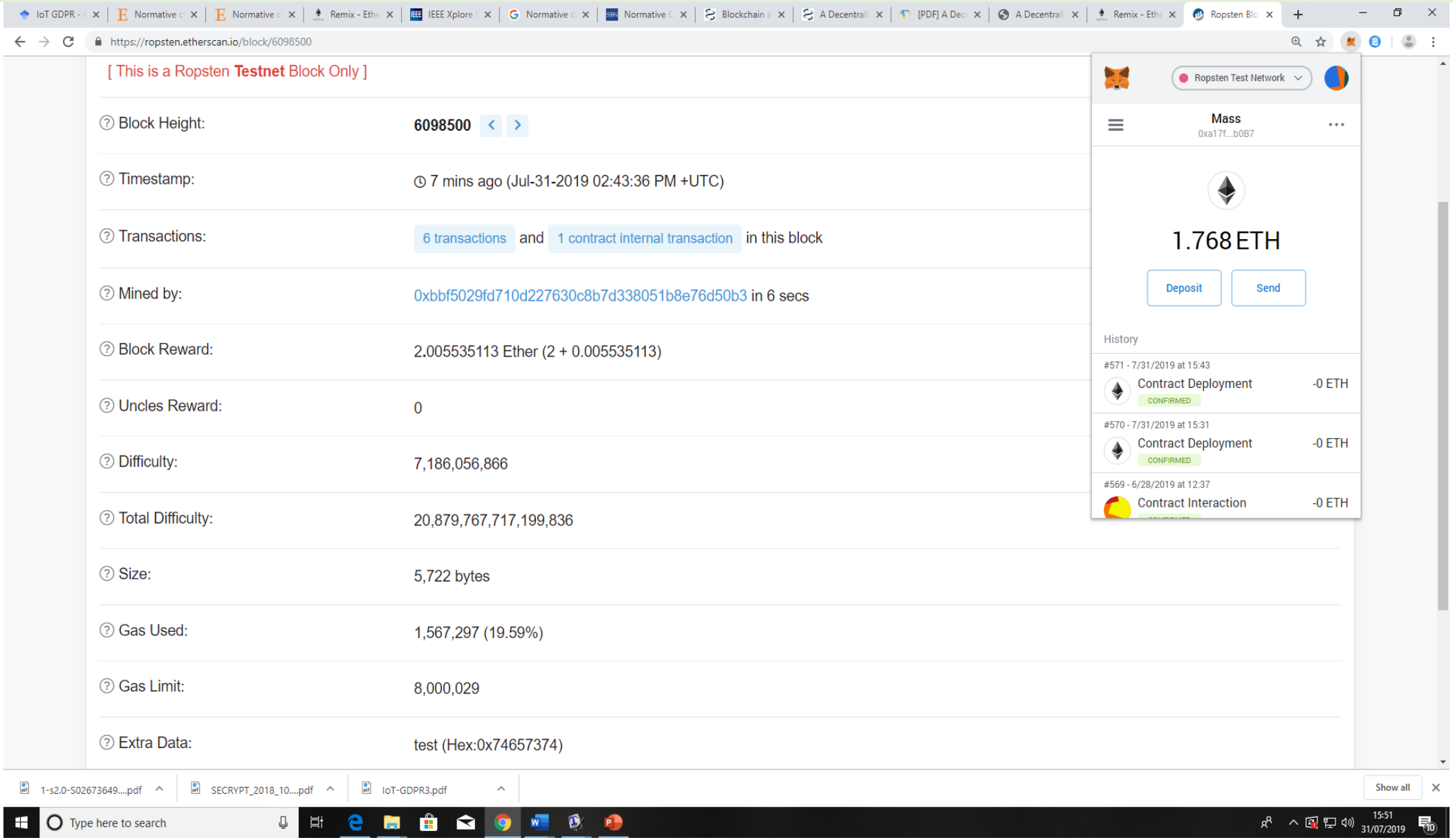
- **Ropsten**: is a public Ethereum test network that allows the deployment of smart contracts
  - gives some details about mining process (e.g., miner and mining time)
  - accepts deployment of contracts with a gas limit under 4712388
  - user has an account with usually a small amount of Ether as a simulated money to run smart contracts

- **Ganache**: is a local test network creating a virtual Ethereum blockchain
  - accepts deployment of contracts without any gas limitation
  - provides as default 10 fake accounts, each of which has 100 Ether
  - creates blocks without any miner (no information about mining process)

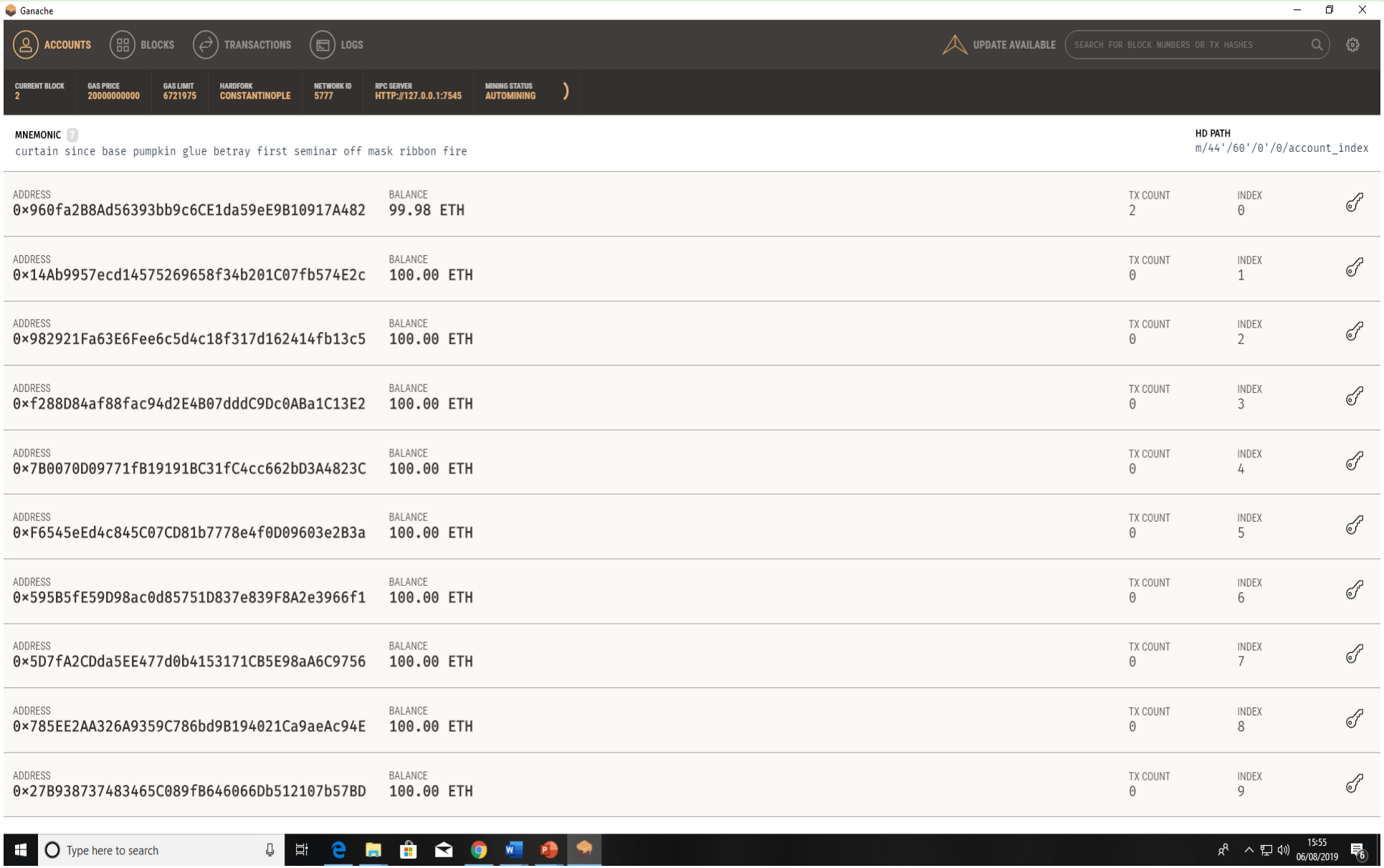
Test on Ropsten: transaction details



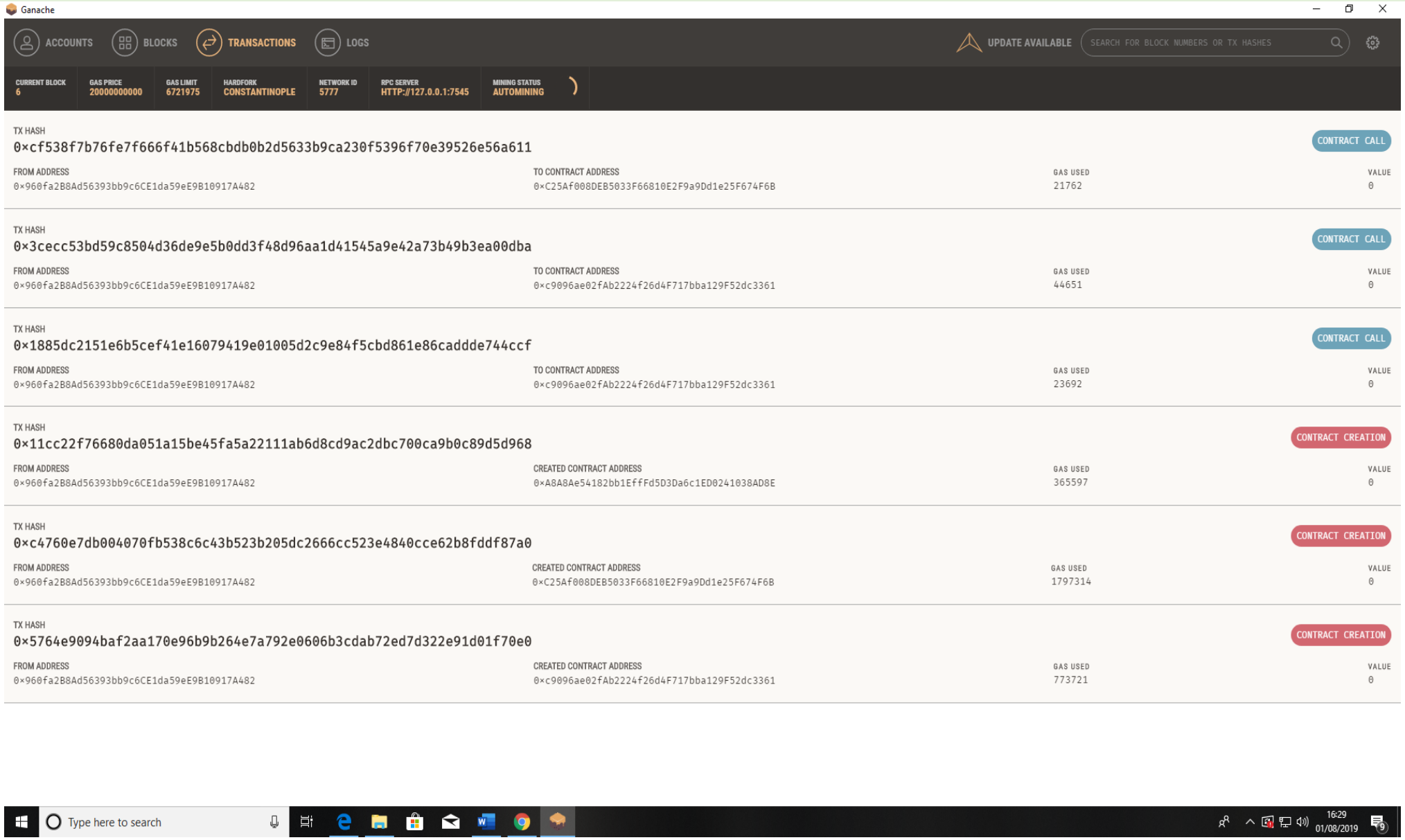
Test on Ropsten: mining details



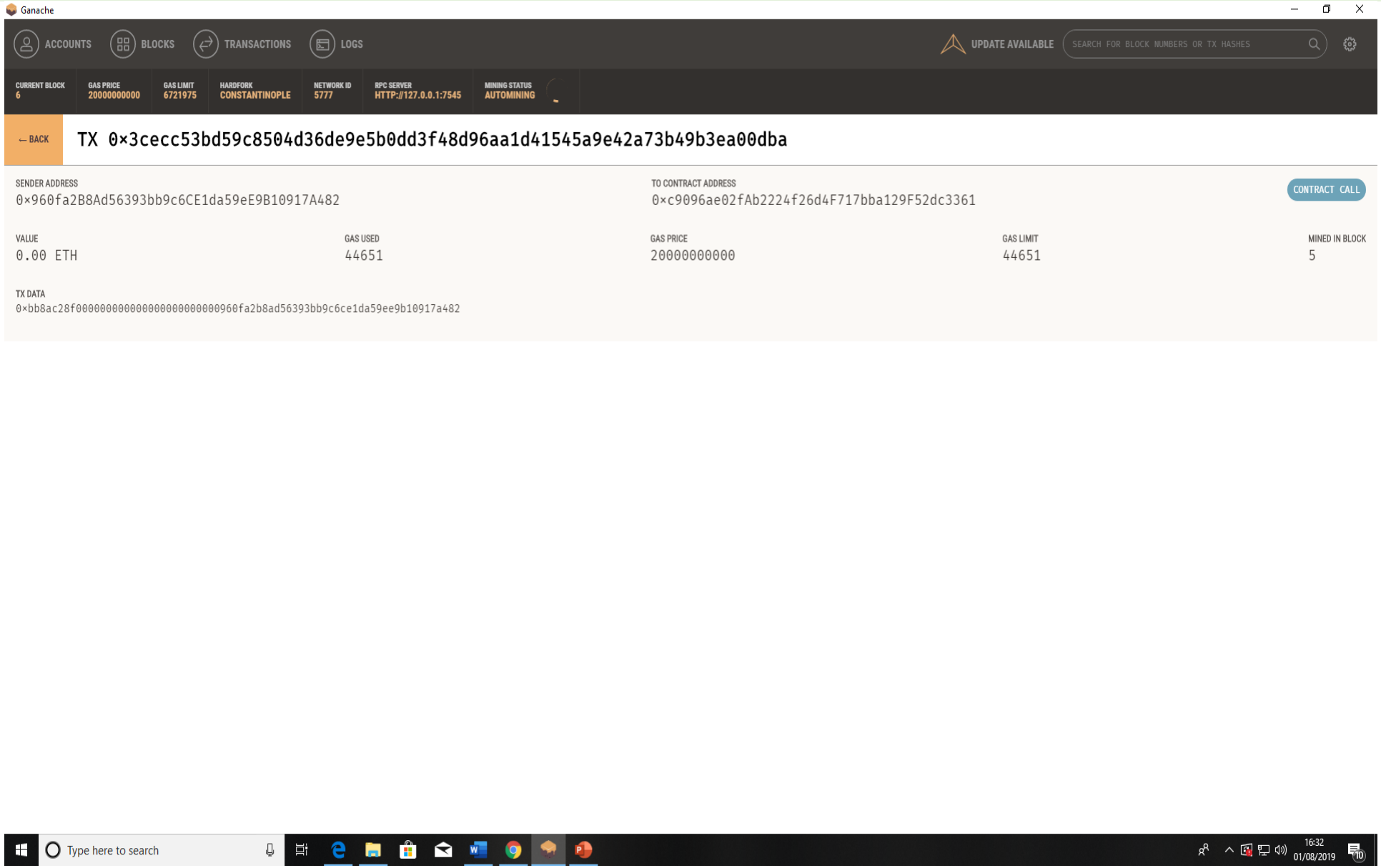
Test on Ganache: free accounts



Test on Ganache: created blocks



Test on Ganache: transaction details



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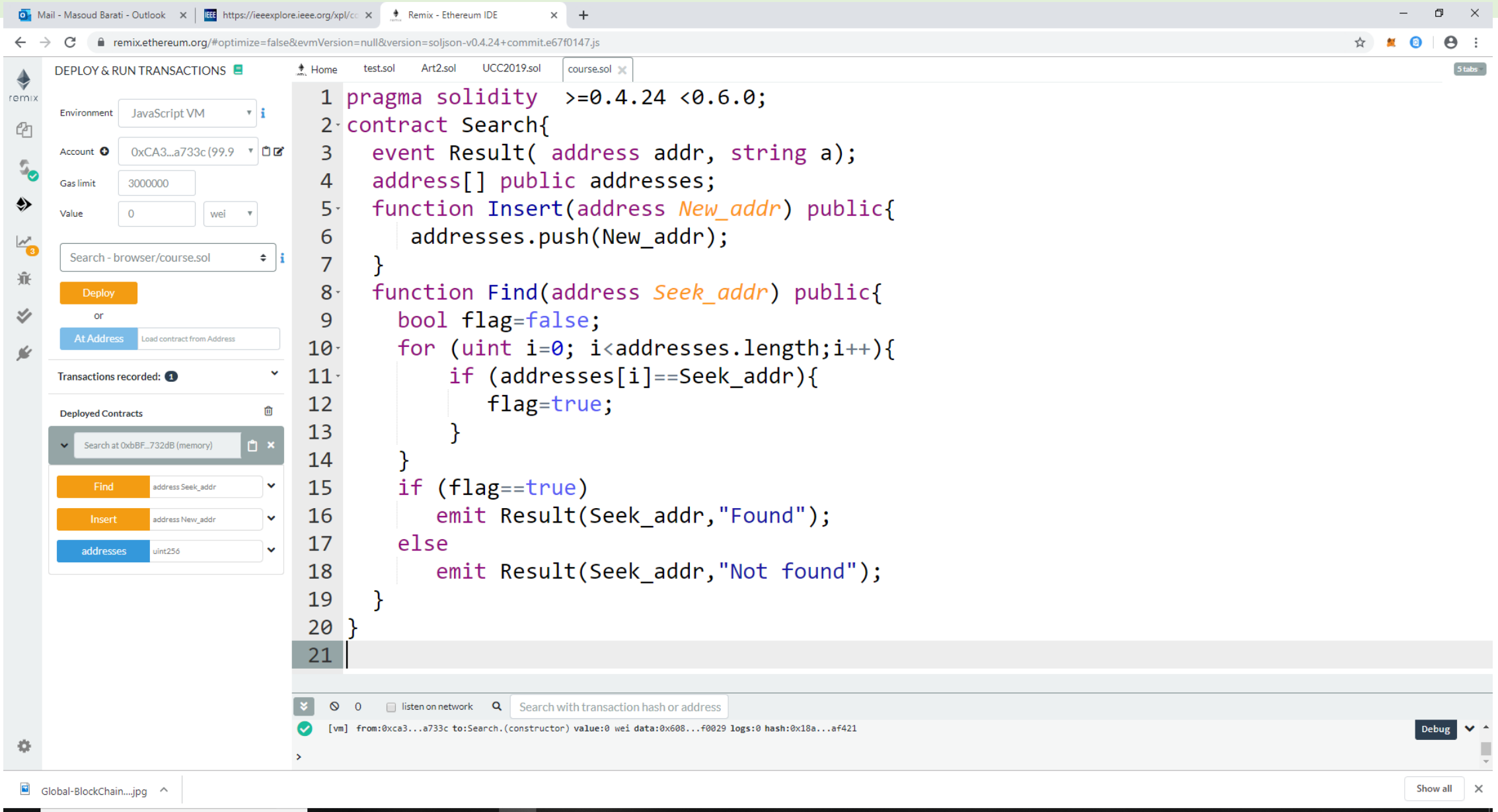
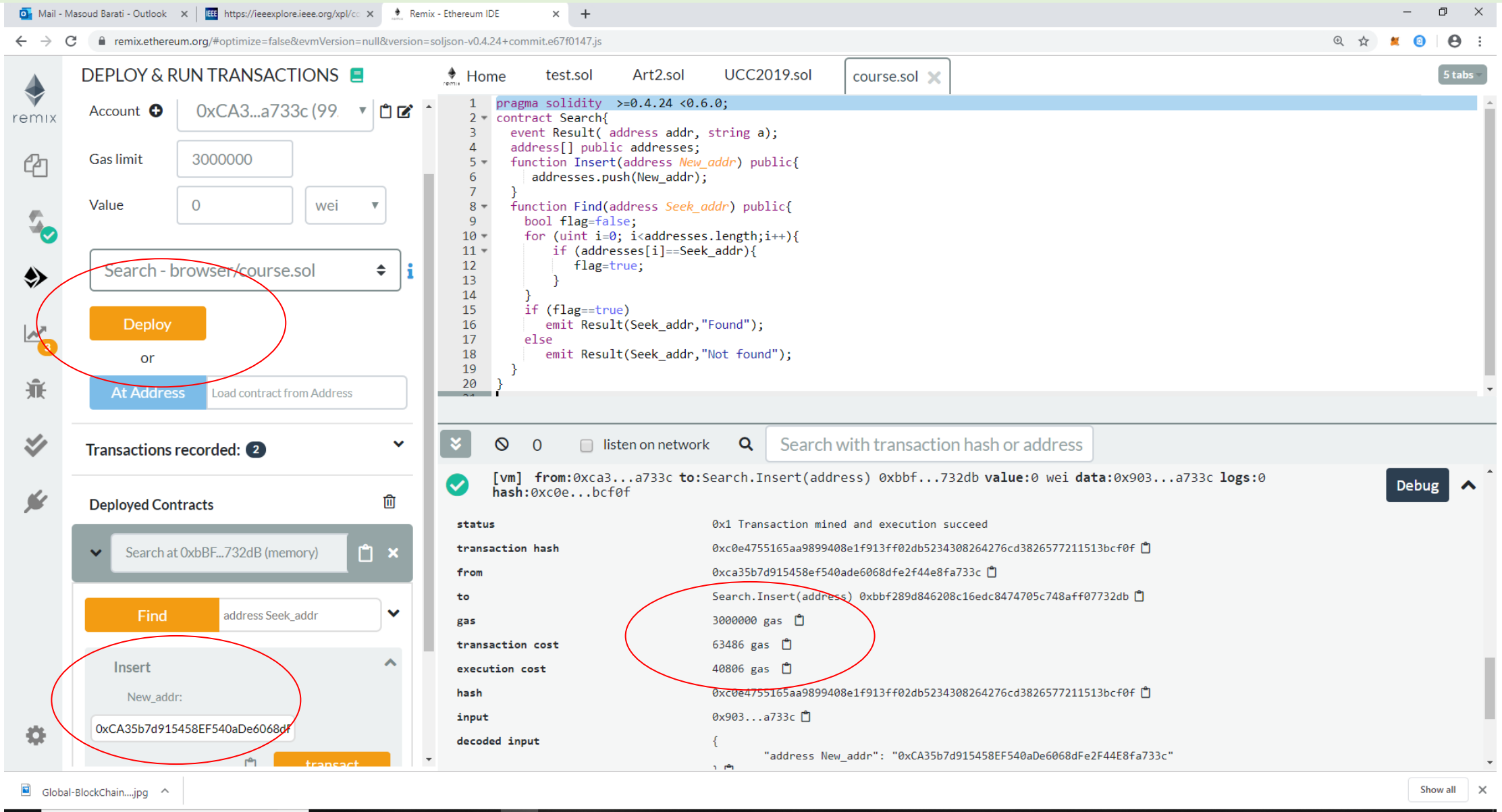
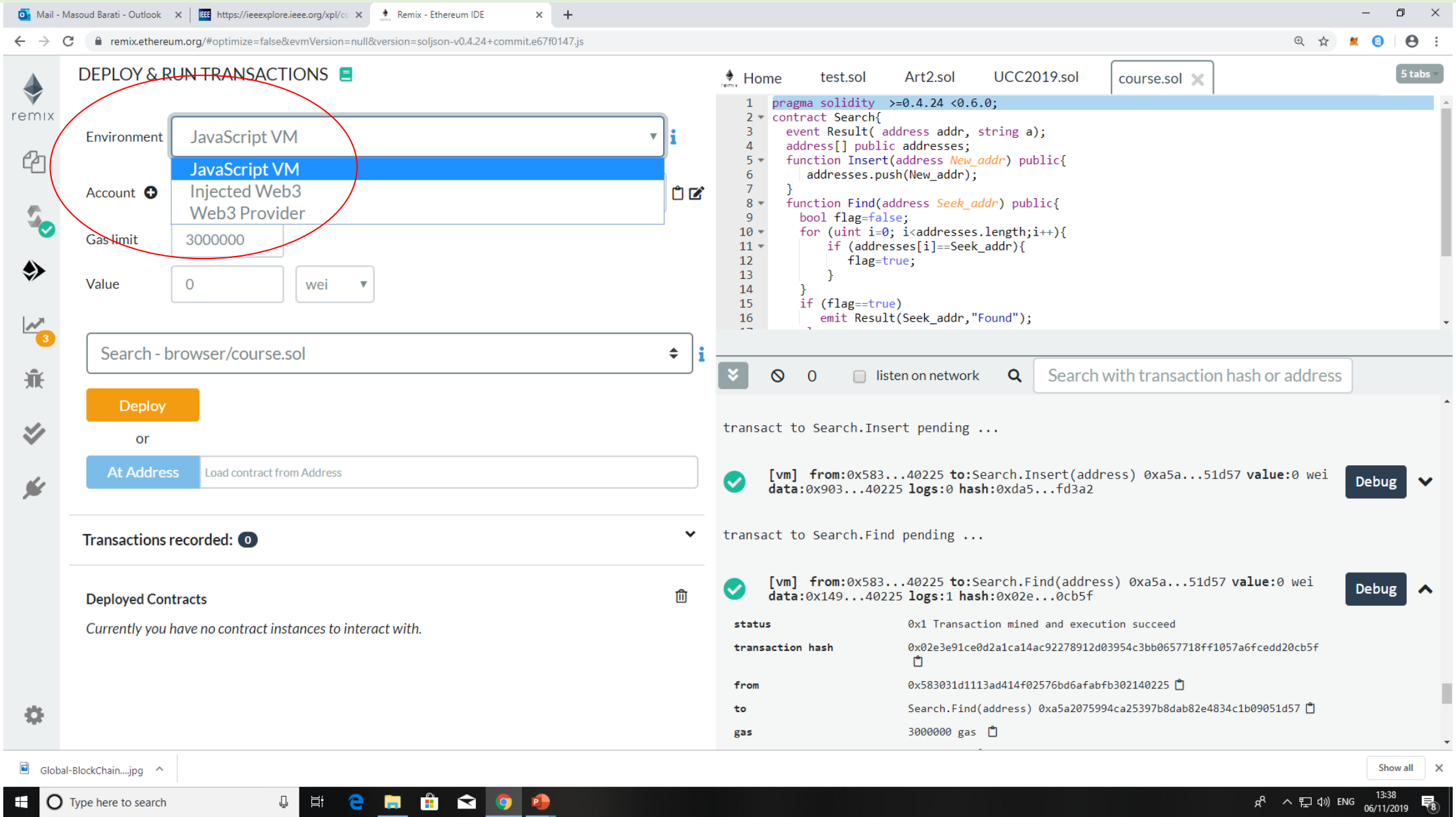
Example 1—search user



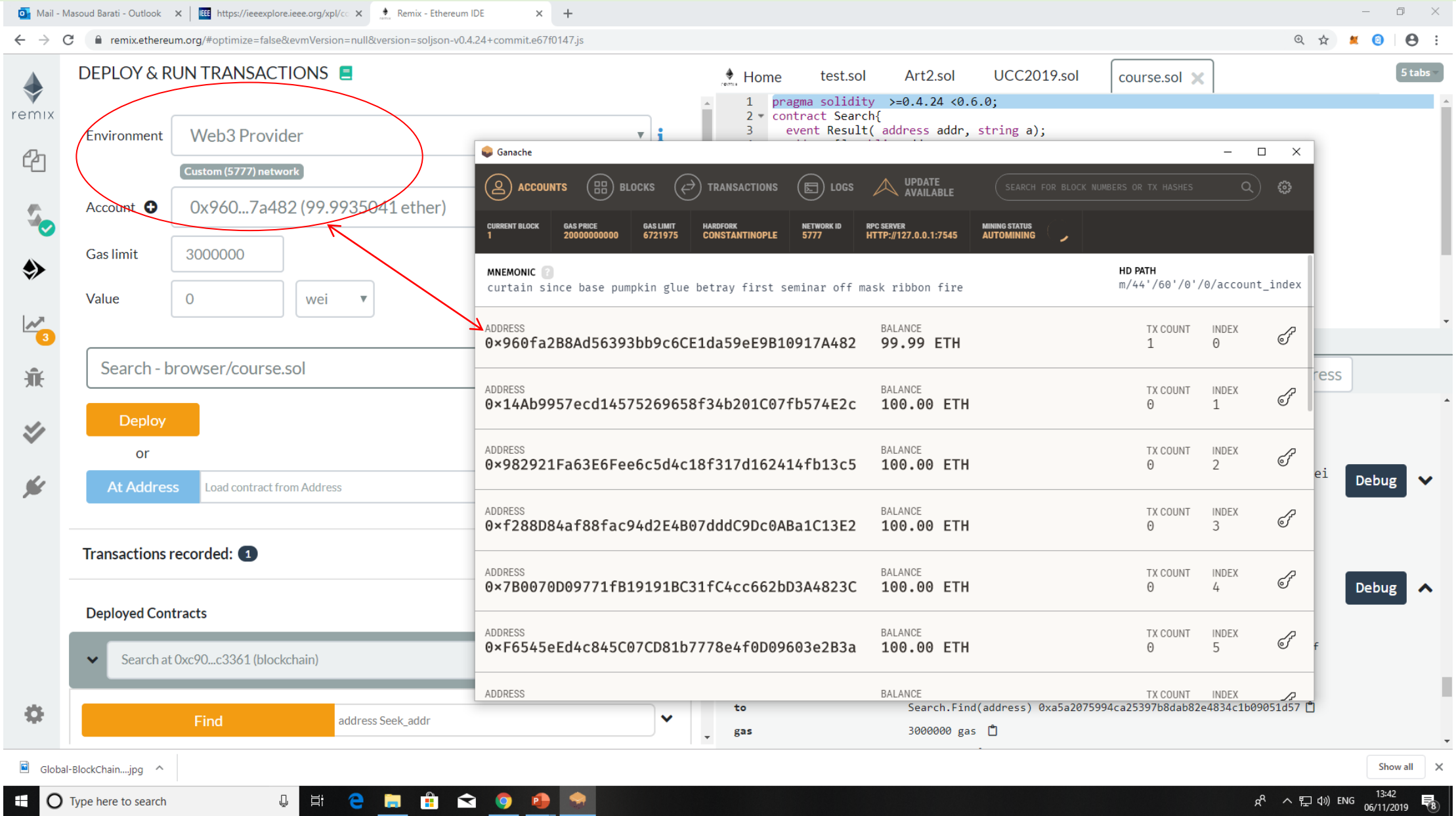
Example 1--Insert



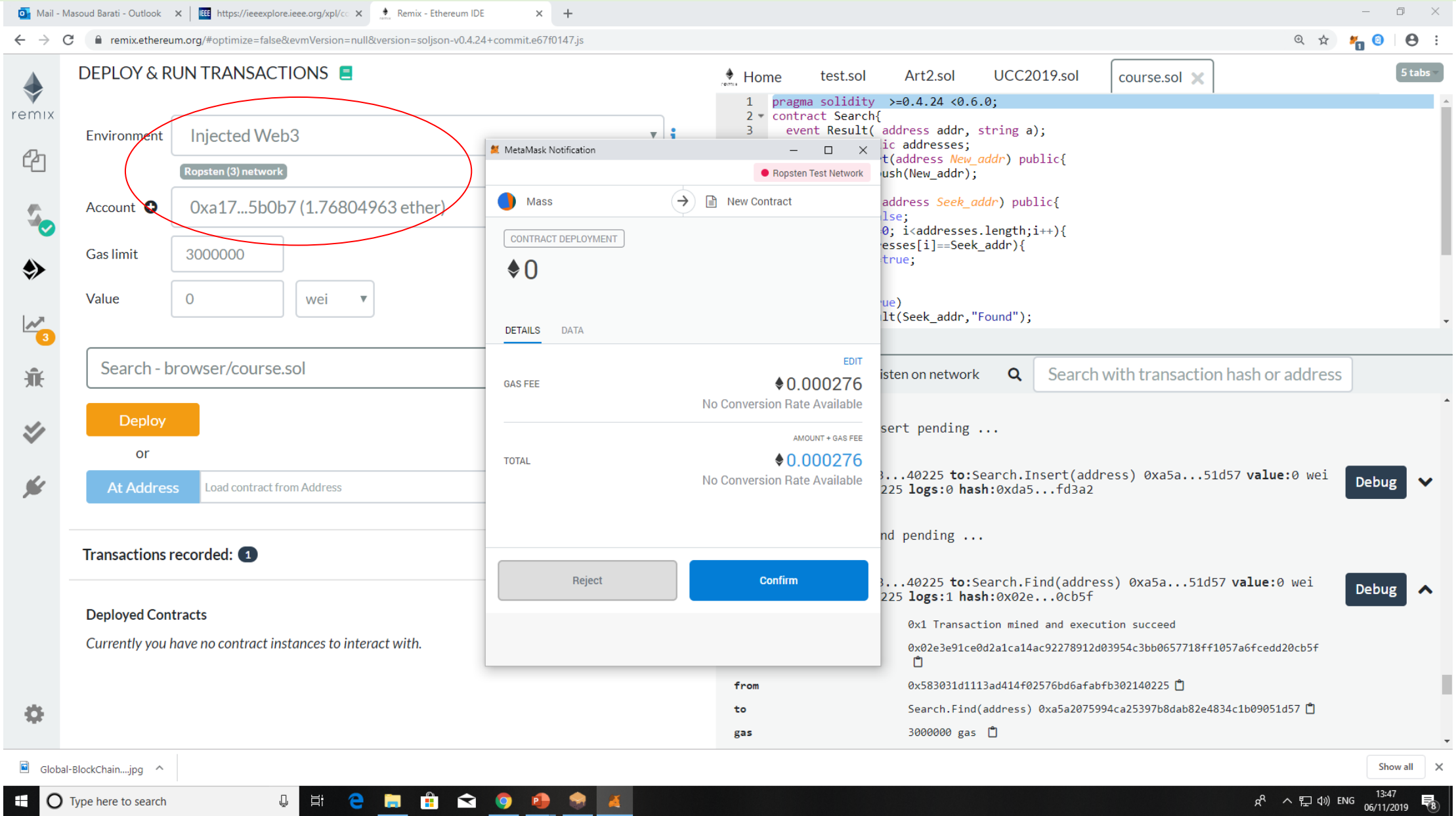
Example 1—Change environment



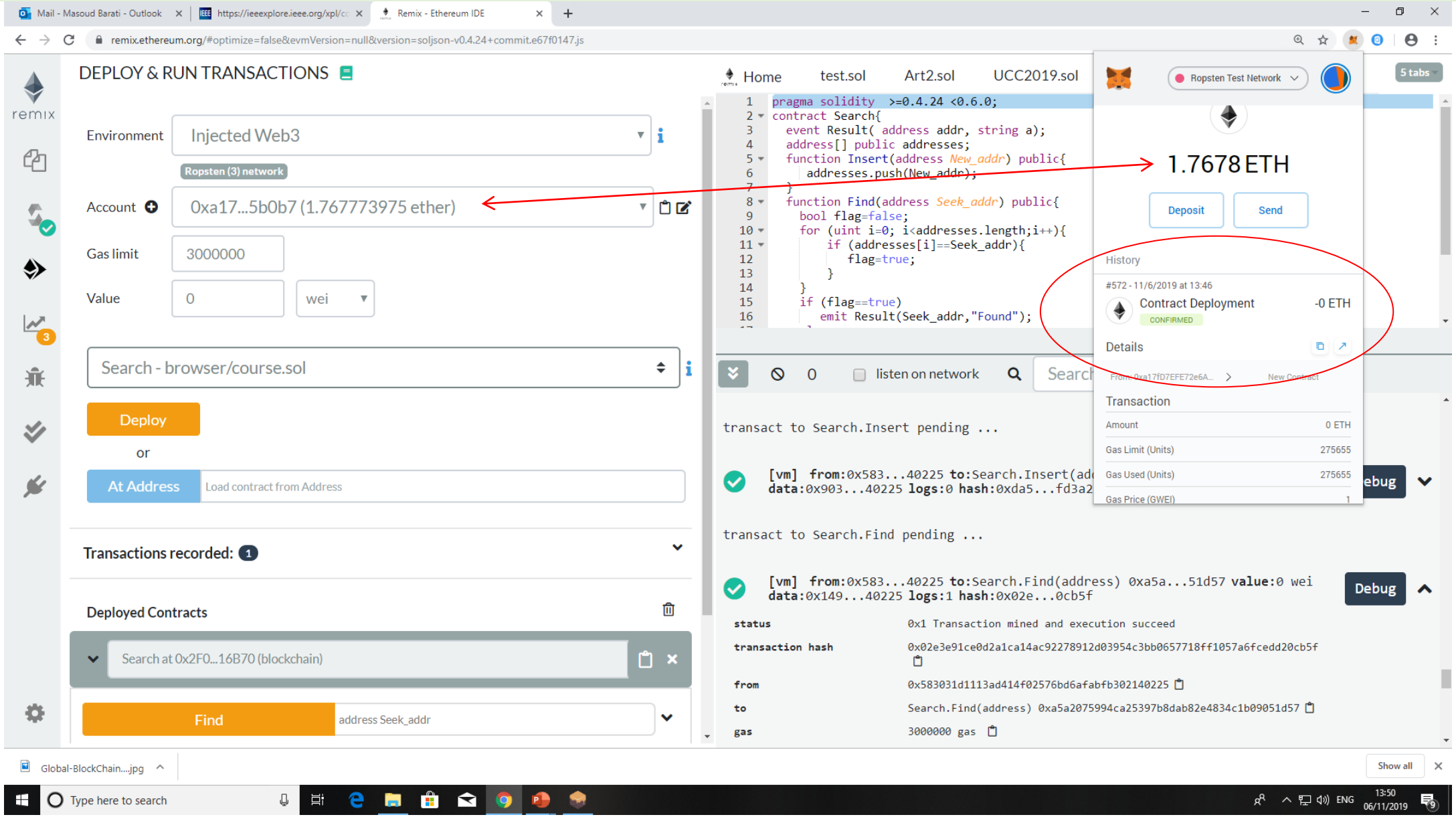
Example 1—connected to Ganache



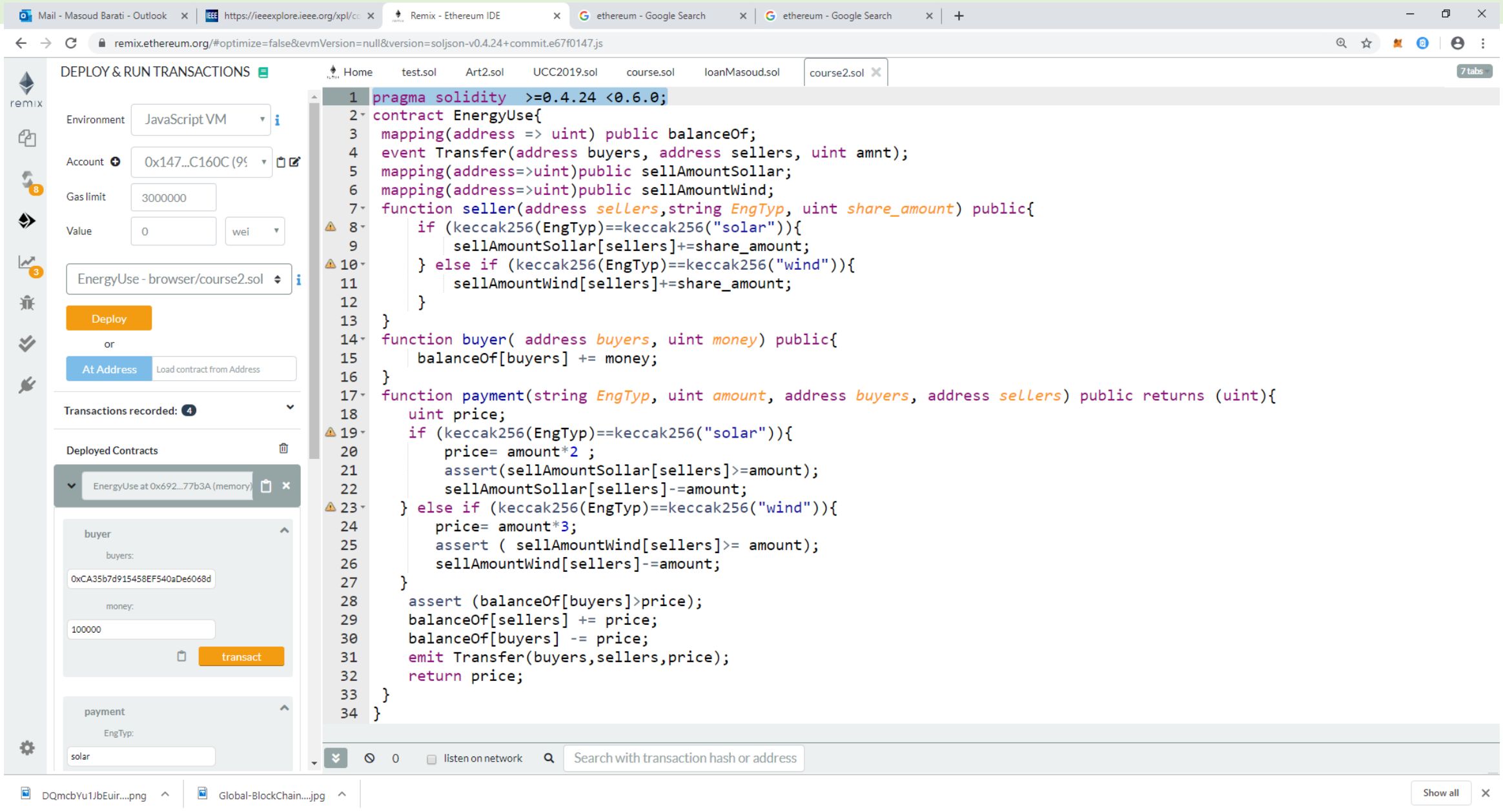
Example 1—connected to Ropsten

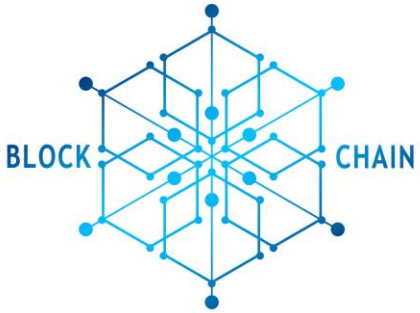


Ropsten--contract deployment confirmed



Example 2—buy energy





Thank you for your attention

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