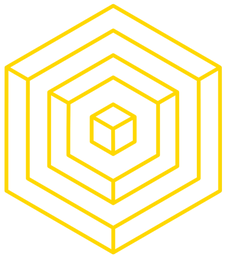
Blockchain Development:
Developer Tools

Haena Lee
Grace Kull



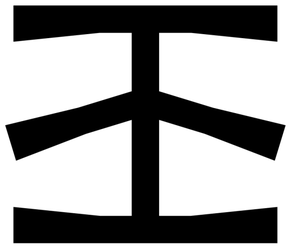
LECTURE OVERVIEW

1. DEVELOPMENT TOOLS OVERVIEW
2. METAMASK
3. REMIX IDE
4. TRUFFLE AND GANACHE
5. HOMEWORK 2

1 DEVELOPMENT TOOLS

DEVELOPMENT TOOLS

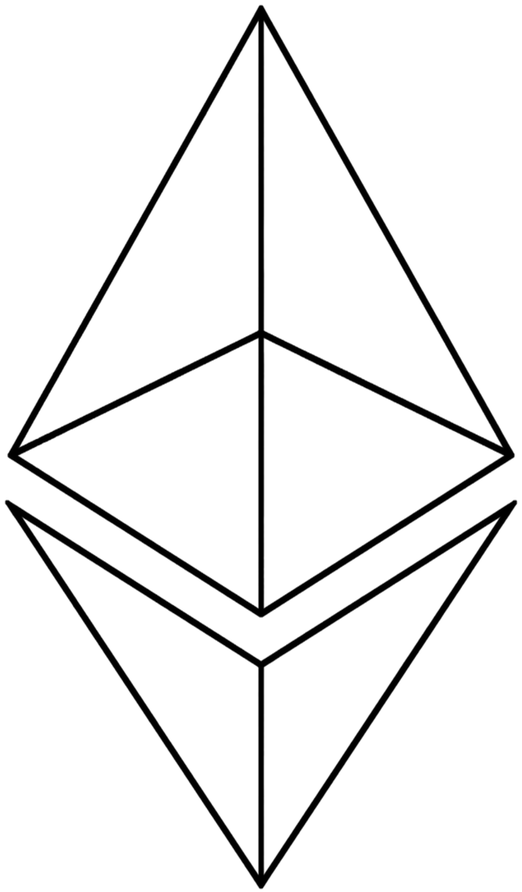
THE MEANS TO ALL EVIL



AUTHOR: MINXING CHEN

DEVELOPMENT TOOLS

...AND GOOD



Mist Blockchain Browser

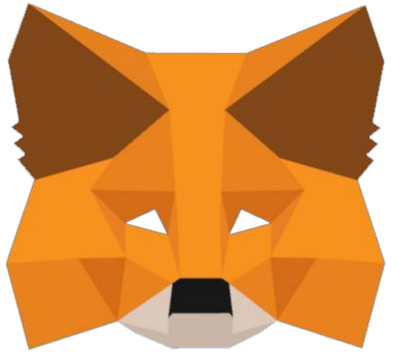
HOMEBREW

Essential macOS package manager

GETH

The Go-Ethereum client

```
brew tap ethereum/ethereum
brew install ethereum
```



METAMASK*

Browser extension; acts as interface to Dapps

SOLC*

Solidity compiler

```
brew install solidity
```

DEVELOPMENT TOOLS

...AND GOOD

NODE.JS

A useful JavaScript library

NPM

JavaScript package manager

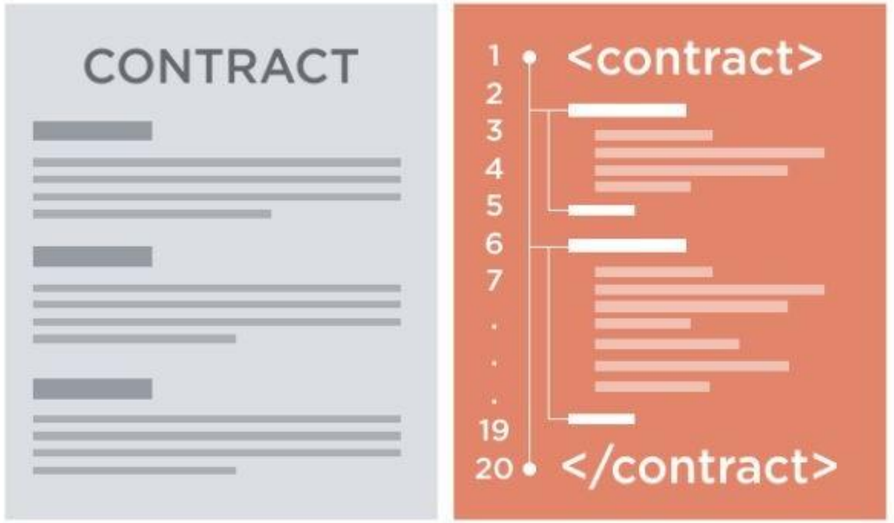
TRUFFLE

Incredibly useful development environment and testing framework

GANACHE/TESTRPC

Simulation of full client behavior

TRUFFLE



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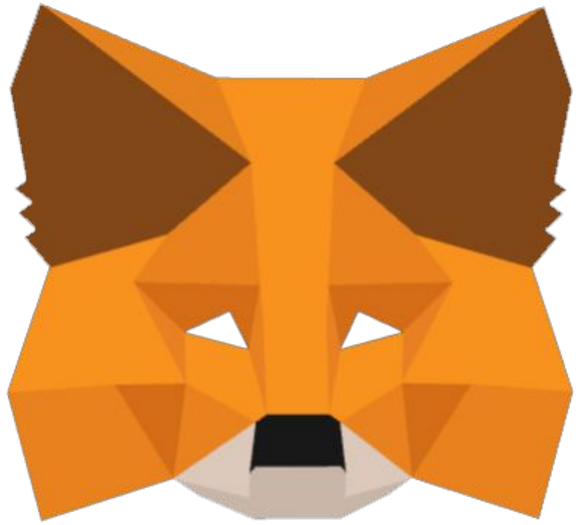
METAMASK

DEVELOPMENT TOOLS

THE MEANS TO ALL EVIL



- Chrome extension that allows access to Ethereum-based dApps in a browser
  - Creation and management of identities/accounts
  - Wallet functionality: interface for accounts and transactions

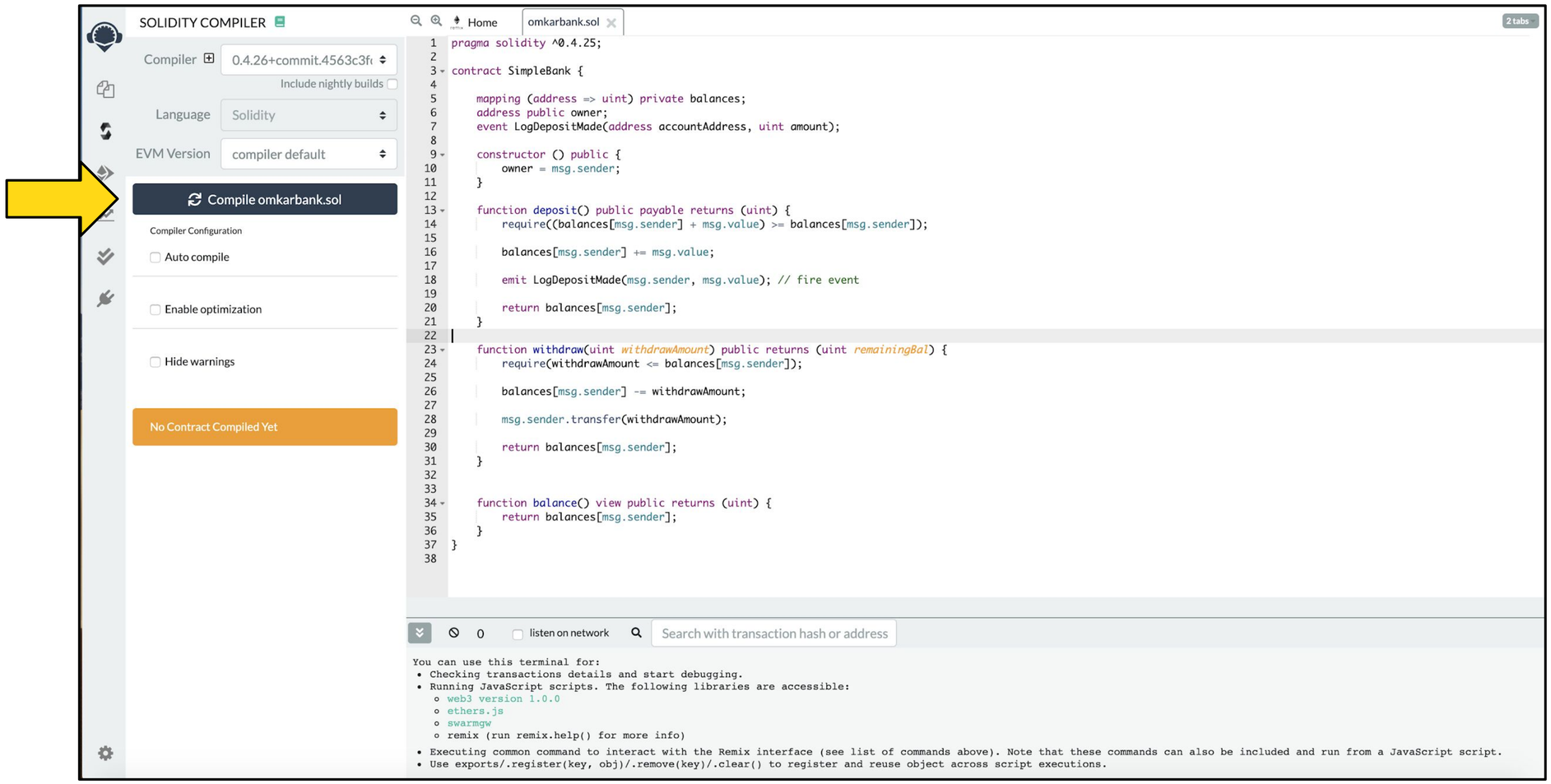
AUTHOR: HAENA LEE

3

REMIX IDE

REMIX IDE

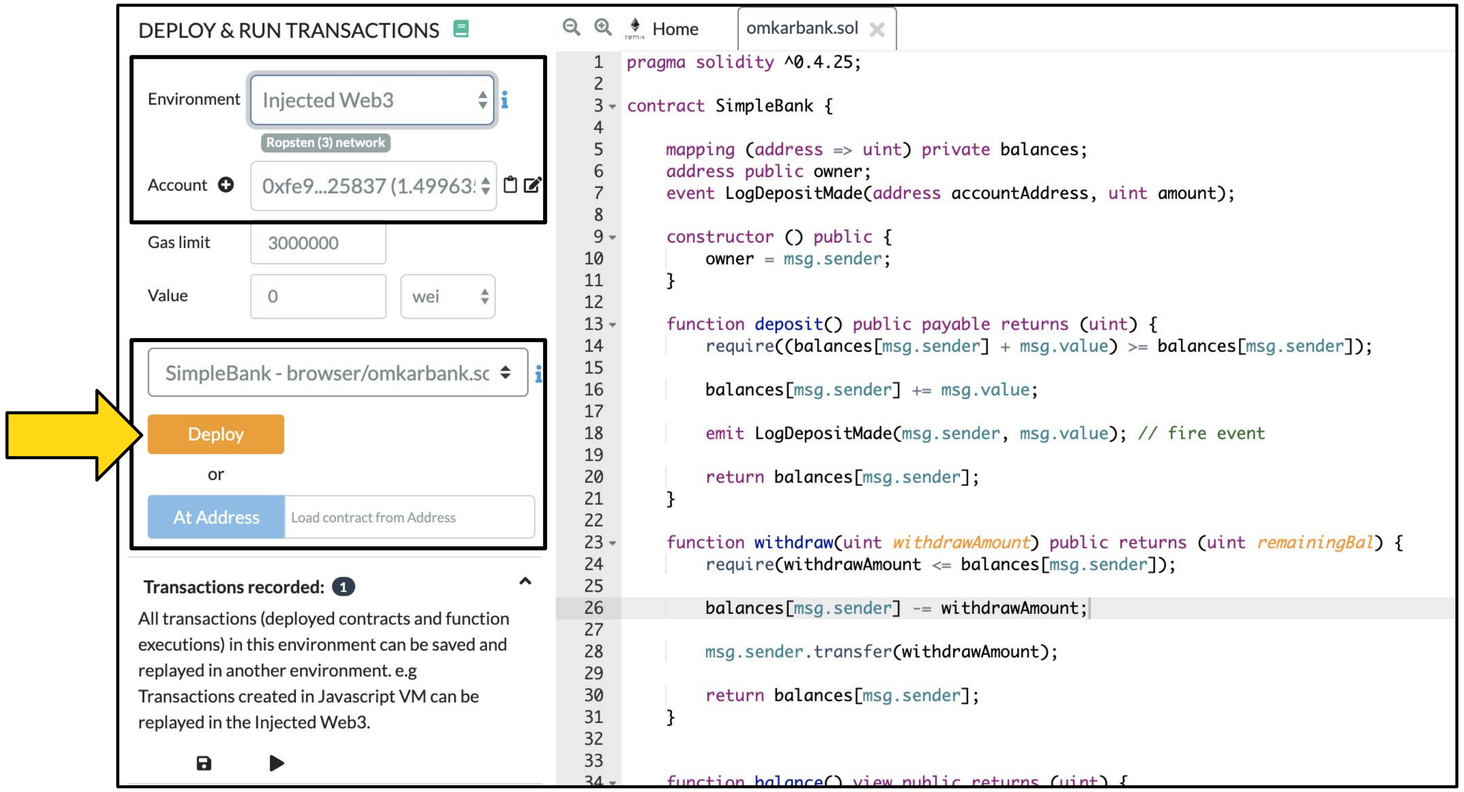
THE WORLD ON A SINGLE WEB APP



AUTHOR: NICK ZOGHB
UPDATED BY: HAENA LEE

REMIX IDE

THE WORLD ON A SINGLE WEB APP



AUTHOR: NICK ZOGHB

BLOCKCHAIN AT BERKELEY

REMIX IDE

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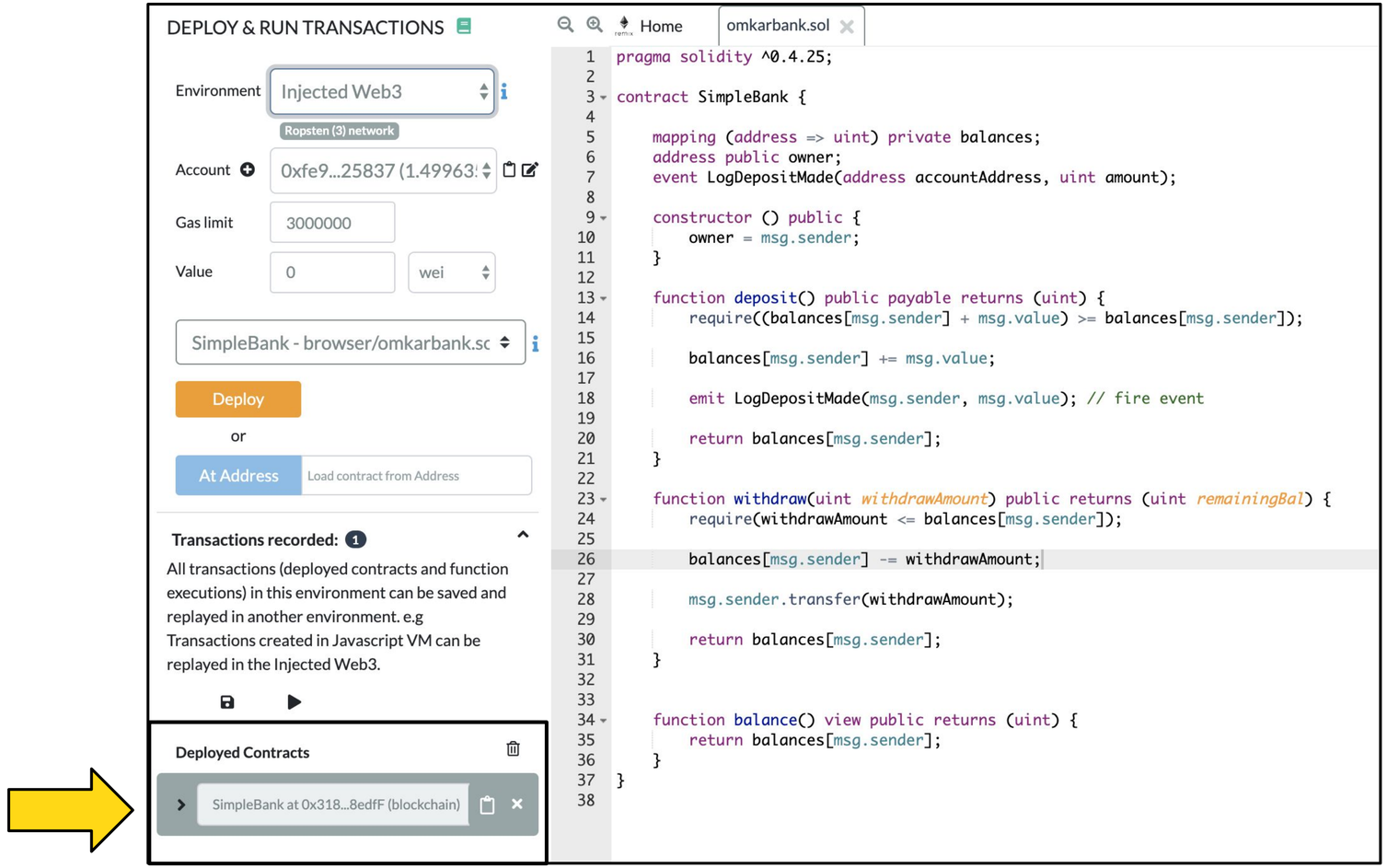

AUTHOR: NICK ZOGHB

BLOCKCHAIN AT BERKELEY

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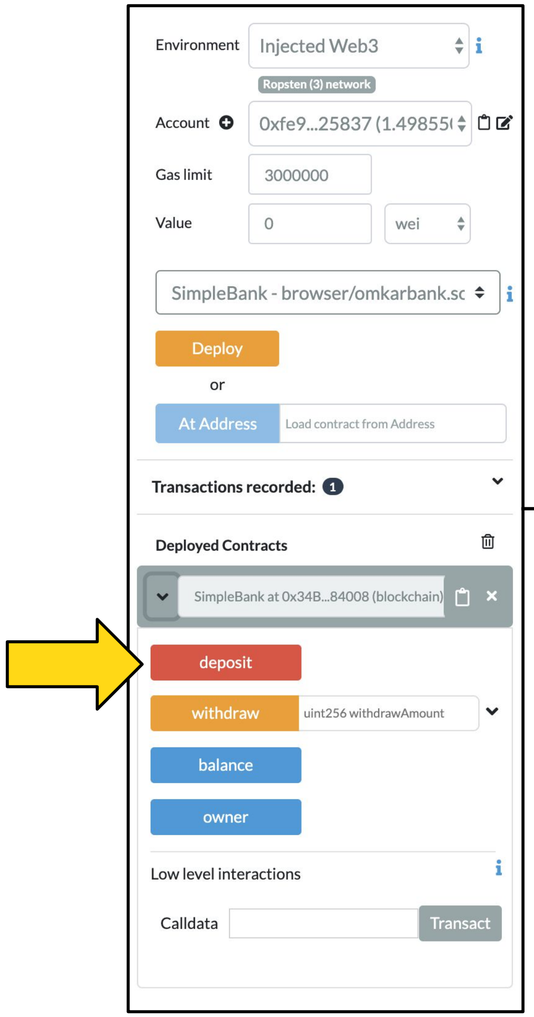

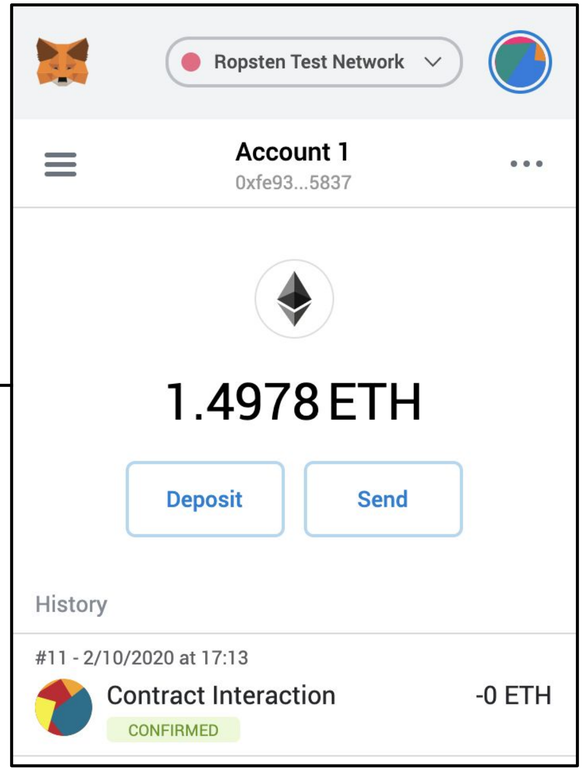

AUTHOR: NICK ZOGHB
UPDATED BY: HAENA LEE

BLOCKCHAIN AT BERKELEY

REMIX IDE

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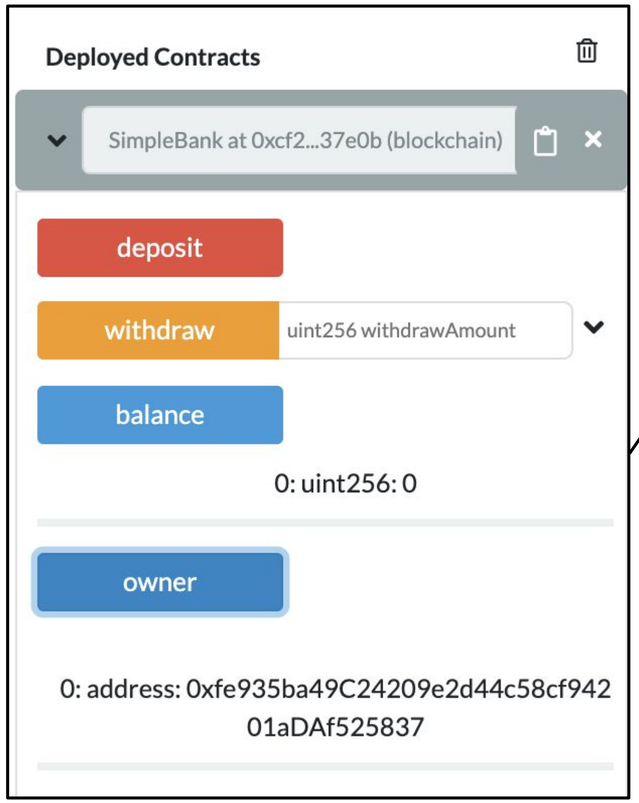



```
call to SimpleBank.balance

CALL   [call]  from:0xfe935ba49C24209e2d44c58cf94201aDAf525837 to:SimpleBank.balance() data:0xb69...ef8a8

call to SimpleBank.owner

CALL   [call]  from:0xfe935ba49C24209e2d44c58cf94201aDAf525837 to:SimpleBank.owner() data:0x8da...5cb5b

>
```

AUTHOR: NICK ZOGHB

BLOCKCHAIN AT BERKELEY

DEMO TIME!

4 TRUFFLE AND GANACHE

TRUFFLE
DELICIOUS

- **Definition:** Truffle is a dApp framework that comes with both a testing unit and boilerplate code templates
- **How to use it:** Install via the command line then use the command line to interact with Truffle
- **Purpose:** Makes development on the blockchain very easy and allows for fast creation of applications. Truffle is a vital part of the workflow when creating dApps

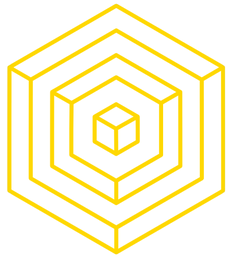
AUTHOR: Matt Peng

GANACHE

YUM

- **Definition:** Ganache is a personal blockchain deployed via the Ganache application
- **How to use it:** Install it from the Ganache website or install the client with the command line
- **Purpose:** Comes bundled with Truffle and often times is the first stage in the testing lifecycle for applications. It allows for local testing by providing ten accounts that each have “fake” ether in them

AUTHOR: Matt Peng



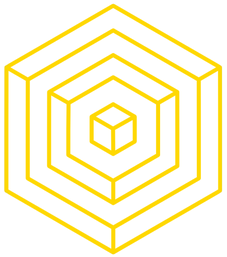
ONE TRUE FRAMEWORK?

DEVELOPMENT IS HARD

We run *Ganache* alongside *Truffle* in a new console window. This starts a new, local blockchain instance powered by Ganache. Why use it?

- Simulates full Ethereum client behavior
  - Accounts (addresses, private keys, etc.)
- Crucial debugging and logging information
- Block explorer and mining controls (block times, etc.)
- Makes developing Ethereum applications much faster

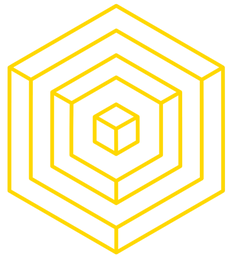
DEMO TIME!



INSTALLATION

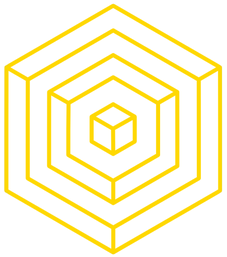
A NECESSARY STEP

```
// Make sure to have npm v5.3.0 and node v8.3.0 installed
$ npm install -g truffle

// Command line interface, github.com/trufflesuite/ganache-cli/blob/master/README.md
$ npm install -g ganache-cli

// Ganache GUI installation: truffleframework.com/ganache/
```



Attendance

https://tinyurl.com/sp20-dev-decal-2



HW2: DEPLOY YOUR FIRST CONTRACT

Development Tools Installation Guides + Demos

- This week, we will be installing all of the necessary developer tools that you will need in your journey of developing on top of blockchains, and walking through demos that will help you become familiar with using these tools. This homework will be divided into two primary sections:
  - Installation Guides
  - Metamask and Remix IDE Demo
- You can find the homework here in our course repo.
- Your check-off will be to show one of the instructors that you have made a transaction with your partner's address.

AUTHOR: HAENA LEE