

Microsoft Student Partners

Blockchain as a Service with Azure Test Labs

Microsoft @ MIT

Sharon Lin, Binh Le, Jenny Xue,
Agni Kumar

March 2018



- MSP Updates
- Intro to Blockchain
- What is Ethereum?
- Developing for the blockchain
- Azure Dev Labs Tutorial

Microsoft Student Partners Updates

Who are the MSPs?

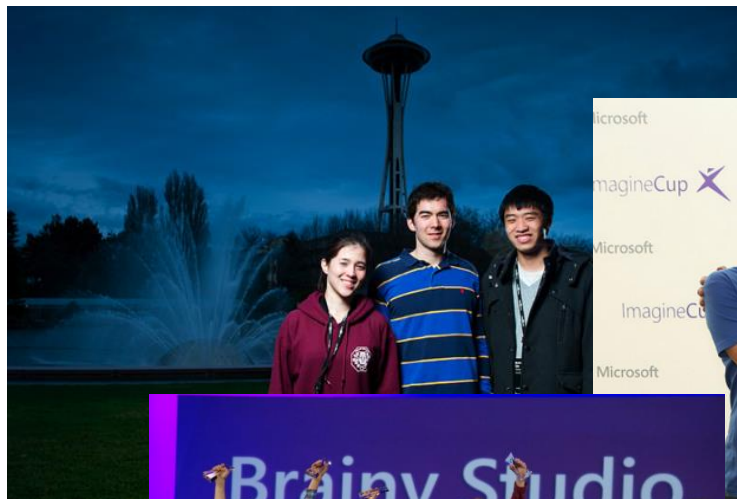
11101110
10101010
10101010

- We are student ambassadors on campus who host fun workshops and promote a community of student engagement in technology!
- We host monthly workshops, give demos on new technology and share Microsoft opportunities
- Email us: mit-msp@mit.edu

- Instructions to redeem the passes at:
<https://www.microsoftazurepass.com/Home/HowTo>
- Azure passes have \$100 value over 3 months
- Subscriptions are activated within minutes of the promo code being redeemed

Microsoft Imagine

11101110
10101010
10101010



Microsoft **Student Partners**

Imagine Cup X

code.FOR THE WIN!

Show the world what you've got.

WIN \$100K. [Register now](#)

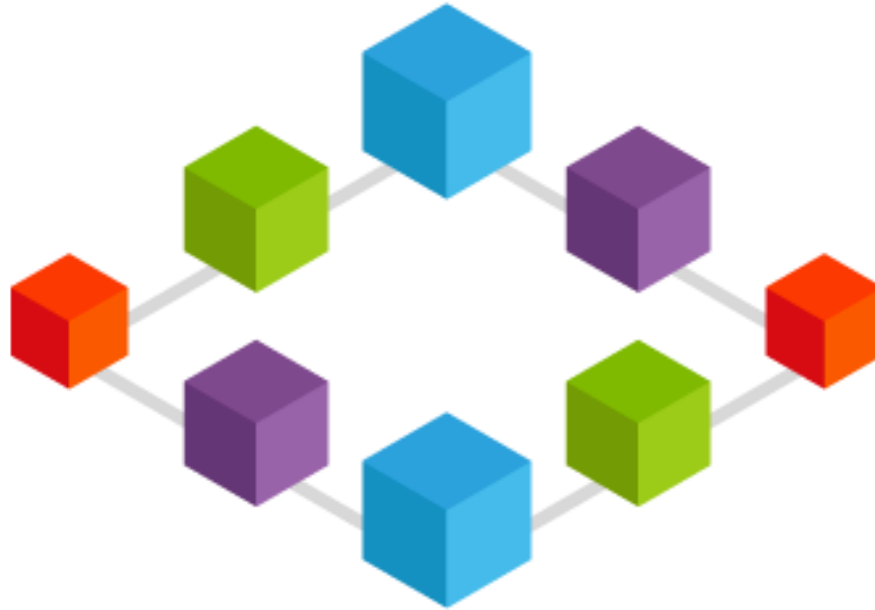




Intro to Blockchain

What is blockchain?

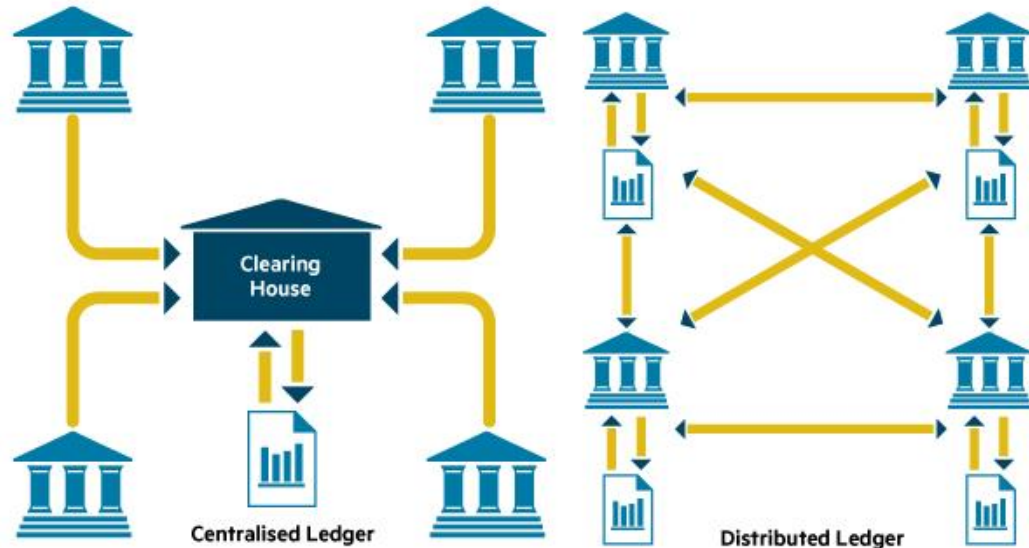
11101110
10101010
10101010



Blockchain is a data structure

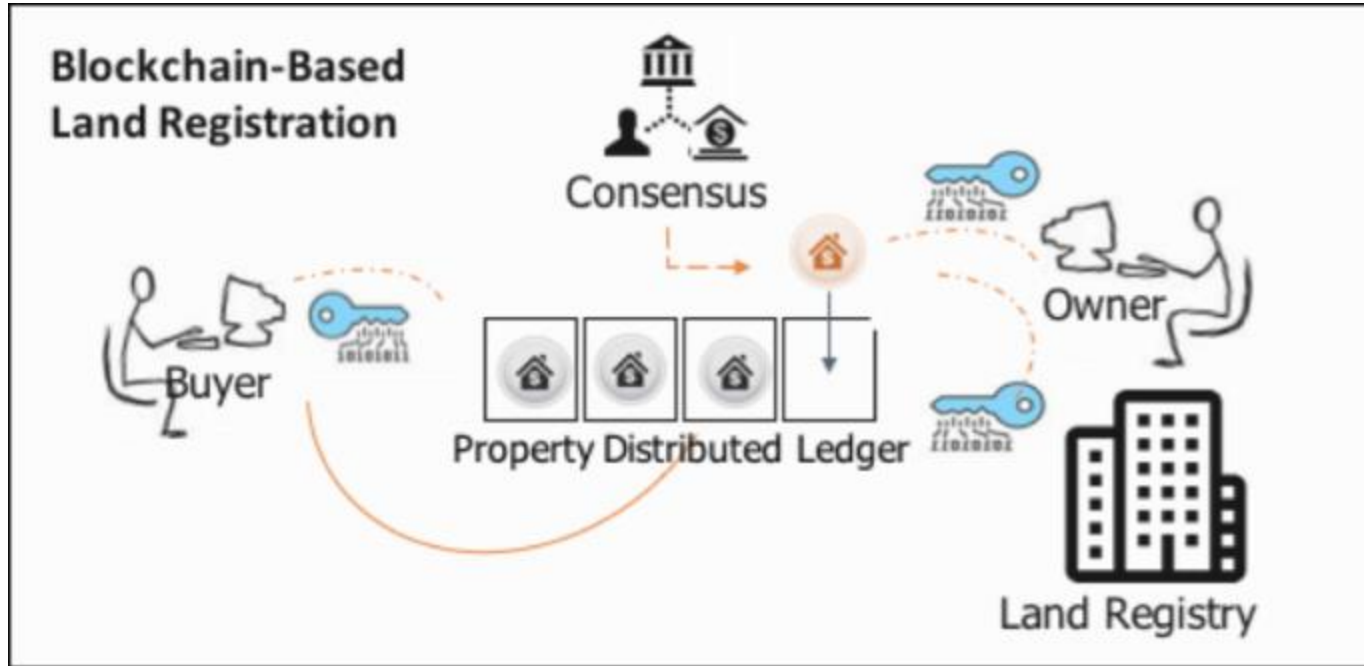
11101110
10101010
10101010

- Cryptographically secure
- Distributed ledger
- Shared value



Cryptographic Keys

11101110
10101010
10101010



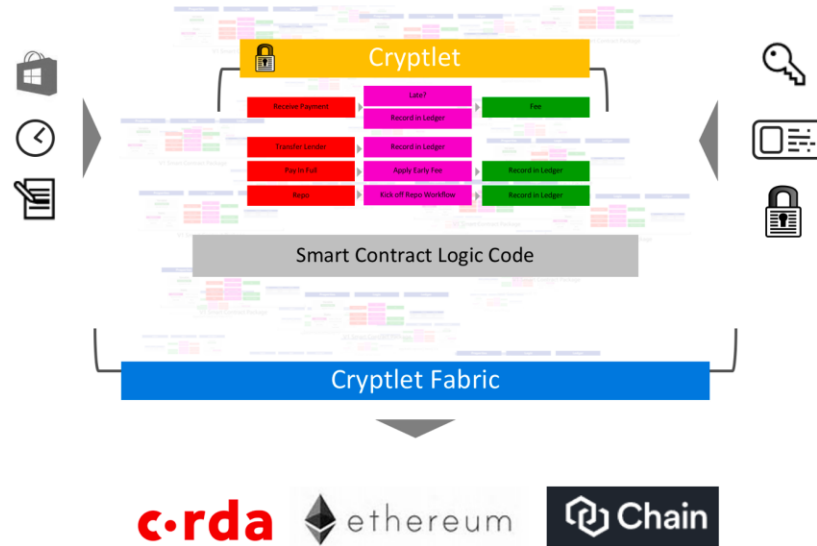
Azure Services for Blockchain

11101110
10101010
10101010



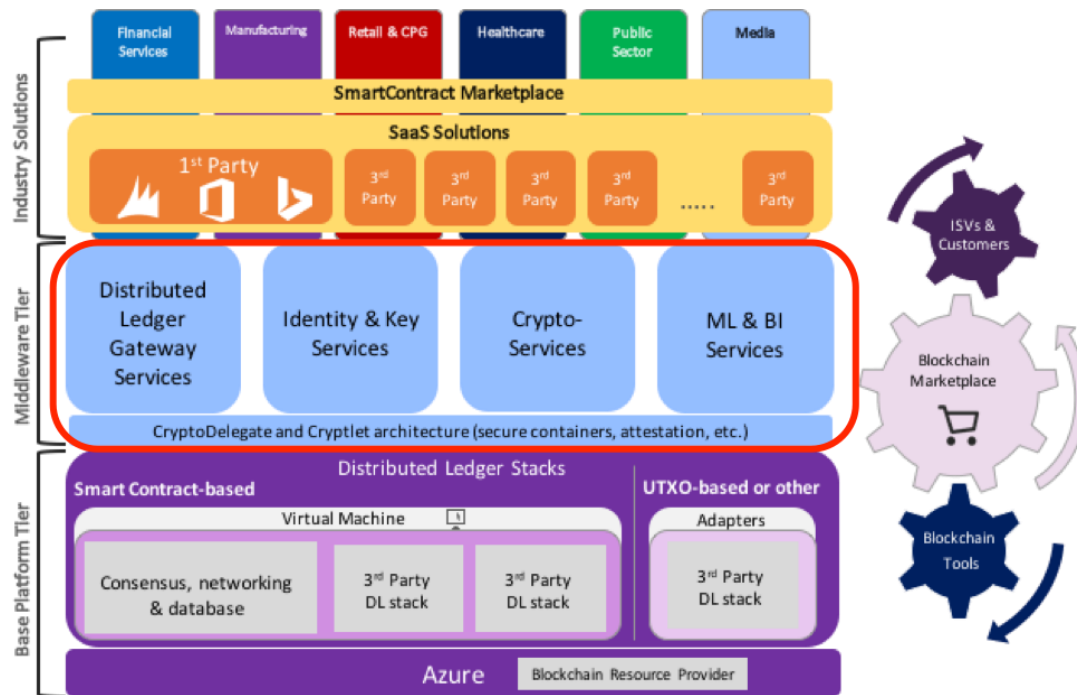
- Azure Dev Labs – Blockchain Labs
- Coco Framework
- Truffle

The Cryptlet Fabric



Major Projects

11101110
10101010
10101010



What is Ethereum?

Differences from Bitcoin

11101110
10101010
10101010

- Miners work to earn Ether
- Building smart contracts

1



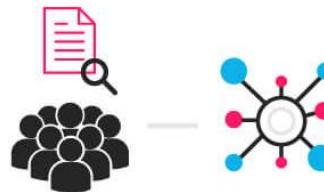
An option contract between parties is written as code into the blockchain. The individuals involved are anonymous, but the contract is the public ledger.

2



A triggering event like an expiration date and strike price is hit and the contract executes itself according to the coded terms.

3



Regulators can use the blockchain to understand the activity in the market while maintaining the privacy of individual actors' positions

- Turing complete software
- Allows you to run any program



Benefits of Decentralized networks

With no central point of failure and secured using cryptography, applications are well protected against hacking attacks and fraudulent activities.

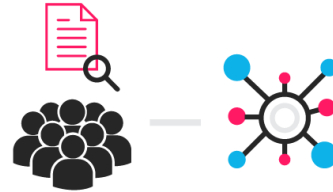


Advantages:

- ✓ Immutability
- ✓ Corruption & tamper
- ✓ Secure

The Blockchain

Blockchain technology is like the internet in that it has a built-in robustness. By storing blocks of information that are identical across its network, the blockchain cannot:



**ENTER
ETHEREUM**

The Ethereum makes the process of creating blockchain applications much easier and efficient than ever before. Instead of having to build an entirely original blockchain for each new application, Ethereum enables the development of potentially thousands of different applications all on one platform.

Developing for the Blockchain

Benefits of Decentralized Apps

11101110
10101010
10101010

- Immutability
- Corruption & tamper proof
- Secure
- Zero downtime

What apps are currently being developed on Ethereum?

Decentralizing Existing Services

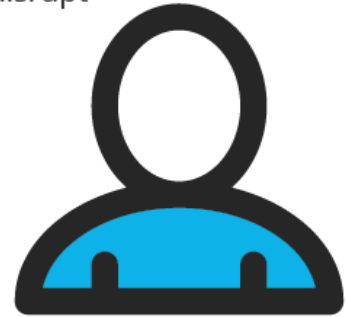


The Ethereum platform is being used to create applications across a broad range of services and industries

A future of unimagined possibilities

Decentralized applications have the potential to profoundly disrupt hundreds of industries

- ✓ finance
- ✓ real estate,
- ✓ insurance



Azure Dev Labs Tutorial

- Based on tutorial [here](#)
- Activate Azure passes
- Log in to Azure portal
- Search for 'DevTest Labs'

Blockchain as a Service

11101110
10101010
10101010

The screenshot displays the Microsoft Azure DevTest Labs interface. The top navigation bar includes the 'Microsoft Azure' logo, a search bar with 'devtest', and a user profile for 'Sharon.Lin@studentp...'. The left sidebar lists various Azure services, with 'DevTest Labs' selected. The main content area shows the 'DevTest Labs' page for 'Microsoft Student Partners'. It includes a toolbar with 'Add', 'Edit columns', 'Refresh', and 'Assign Tags' buttons. Below this, a filter section shows 'Subscriptions: Azure Pass' with a search box and dropdowns for 'All resource groups', 'All locations', and 'No grouping'. A table lists 1 item, 'BlockchainDemo', with a status of 'Ready' and a subscription of 'Azure Pass'.

Microsoft Azure

devtest

Sharon.Lin@studentp...
MICROSOFT STUDENT PARTN...

Home > DevTest Labs

DevTest Labs
Microsoft Student Partners

+ Add Edit columns Refresh Assign Tags

Subscriptions: Azure Pass

Filter by name... All resource groups All locations No grouping

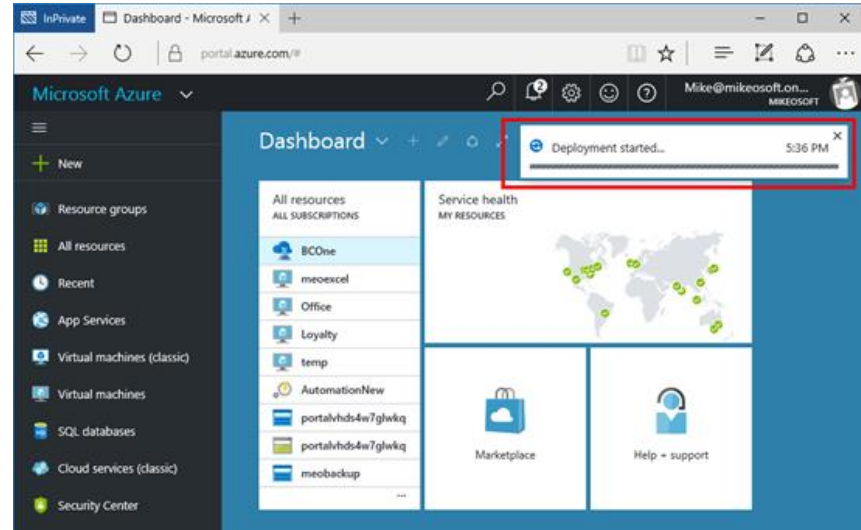
1 items

NAME ↑↓	STATUS	SUBSCRIPTION ↑↓
BlockchainDemo	Ready	Azure Pass

Create DevTest Labs Instance

11101110
10101010
10101010

- Enter name for the lab
- Set location to 'East US'
- Pin to dashboard
- Deploy the instance



- Find the deployed app
- Click '+Virtual Machine'
- Configure the Virtual Machine
 - Steps on the next slide

- Select "Ubuntu Server 14.04 LTS" as the base image
- Give the machine a name eg EthNode1
- Provide a username and password
- Set a machine size eg Standard_D2_v2
- VirtualNetwork and Subnet should be preconfigured f.
Leave the IP address as public
- Click on "Artifacts" to add the required Ethereum components

Connect to Virtual Machine

11101110
10101010
10101010

Choose a base > Virtual machine

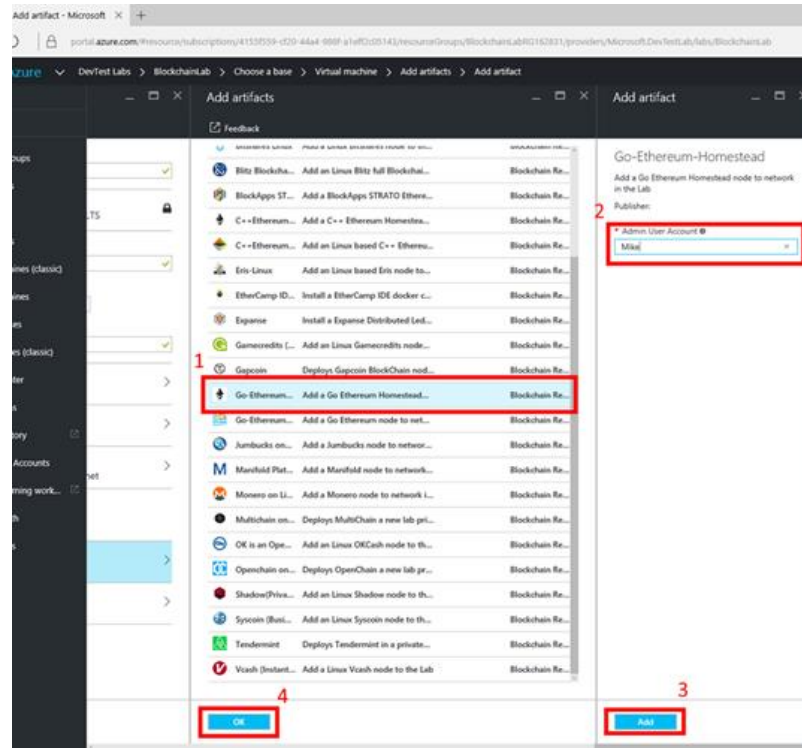
Virtual machine name	Image	User name	Authentication type	Password	Virtual machine size	Virtual network	Subnet	Public IP address	Artifacts
EthNode1	Ubuntu Server 14.04 LTS	Mike	Password	*****	Standard_D2_v2	DtlBlockchainLab	DtlBlockchainLabSubnet	Yes	0 artifact(s) selected

Cancel Create

- Select "Go-Ethereum-Homestead"
- In the blade that appears, enter the username you created earlier into the Admin User Account field
- Click Add on the artefact configuration (username) blade
- Click OK on the "Add artifacts" blade
- Click Create on the "Virtual Machine" blade which will now have 1 artifact selected

Connect to Virtual Machine


11101110
10101010
10101010



Connect to Virtual Machine

11101110
10101010
10101010

Home > DevTest Labs > BlockchainDemo

BlockchainDemo

DevTest Lab

Search (Ctrl+J)

Overview

Getting started

Internal support

MY LAB

My virtual machines

Claimable virtual machines

All virtual machines

My data disks

Formulas (reusable bases)

My secrets

SETTINGS

Configuration and policies

Refresh

Add

Claim any

Delete

MSDN forum

Feedback

Essentials

Resource group (change)
BlockchainDemoRG722530



Status
Ready

Location
East US

Subscription name
Azure Pass

Subscription ID
61bc2f0d-41ef-4fd3-a18b-33e59567c4dd

My virtual machines

	NAME	STATUS	AUTO-START	AUTO-SHUTDOWN	BASE	
	EthNode1	Running	No	Yes	Ubuntu Server 14.04 LTS	...
	EthNode2	Running	No	Yes	Ubuntu Server 14.04 LTS	...

- Use SSH client or Terminal
- In the DevTest Lab blade, click through to the VM you want to connect to
- Note the auto-start and auto-shutdown tile. You can opt-in to have your VMs automatically shutdown out of hours ensuring they don't incur unnecessary costs
- Capture the public IP address of the VM so we can connect to it over SSH.

SSH into the VM

11101110
10101010
10101010

Microsoft Azure portal showing the settings for a virtual machine named 'EthNode1'.

The 'Running' tab is selected, and the 'Essentials' section is expanded. The 'Public IP address' field is highlighted with a red box, showing the IP address '10.178.146.30'.

The 'Opt-in/out of auto-start and auto-shutdown' section is also highlighted with a red box. It shows the following settings:

OPT-IN	TIME	NOTES
Auto-shutdown*	<input checked="" type="checkbox"/>	1900 Daily
Auto-start*	<input type="checkbox"/>	Policy disabled in the lab

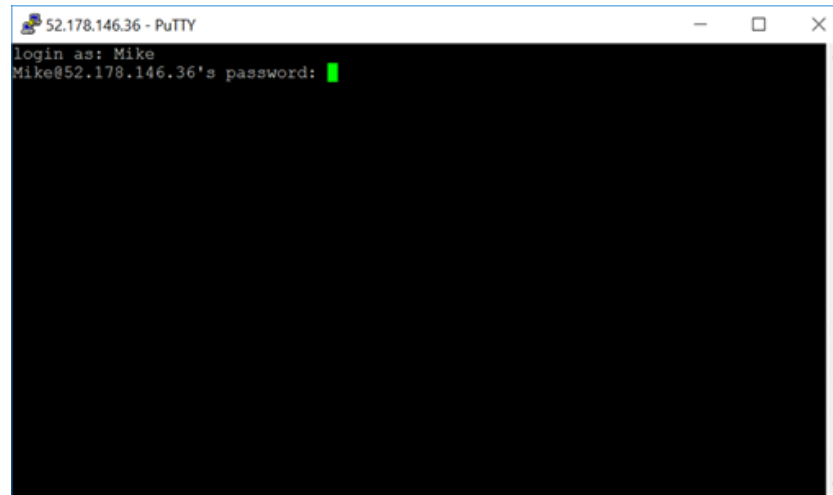
* Your lab admin sets the auto-start and auto-shutdown policies. [Learn more.](#)
* Times are shown in local browser time.

1

SSH into the VM

11101110
10101010
10101010

- Open a connection
- Log in with the credentials you used
 - i.e. sharonl@ethnode2438421.eastus.cloudapp.azure.com



- Git clone the demo app
- <https://github.com/sharon-lin/ethereum-todo-list>

- cd into the directory
- If you don't have Node v8.9.0 or NPM v4.0.5
 - Download <https://nodejs.org/en/>
- Install Truffle
 - npm install -g truffle
- Install Ethereum Testrpc
 - npm install -g ethereumjs-testrpc

- Open terminal and start 'testrpc'
- Open another terminal and 'npm install'
- Start the app with 'npm start'
- Navigate to 'localhost:3000' to see your app!

Git clone demo app

11101110
10101010
10101010

ETB Ethereum ToDo List App

Contract deployed at address: 0x6c82edcee5ccdde2531924879c5f491703397565

Create Task

Content

Author

Submit

Tasks

ID	Date	Content	Author	Done
1	19/1/1970 - 20:47	Go buy errands	Julien	<input type="checkbox"/>
2	19/1/1970 - 20:47	Create a new episode for Eat The Blocks	Julien	<input type="checkbox"/>
3	19/1/1970 - 20:47	Finish a blog post	Mike	<input checked="" type="checkbox"/>

Wrap Up and Survey

- <https://aka.ms/2017-18usmspworkshopsurvey01>



Find us online!

11101110
10101010
10101010

- Join our Facebook group
- <https://www.facebook.com/groups/1348976768447282/?ref=bookmarks>