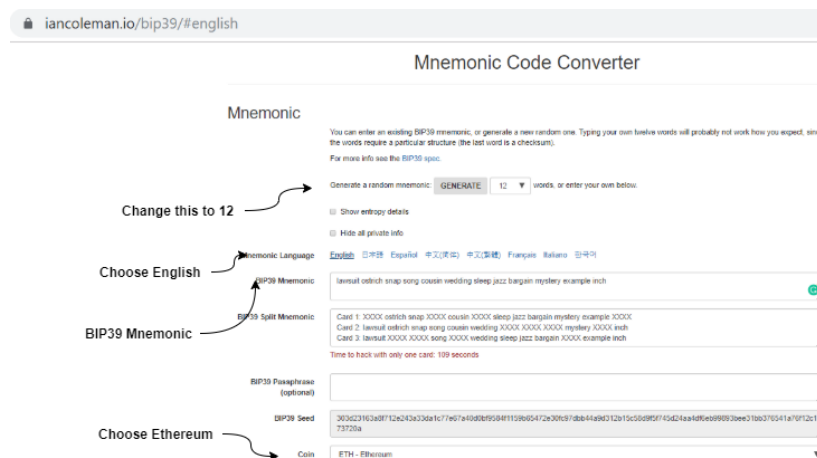**Pre-requisite: At least step 1 and 2 of installation guide.**

Note: We are planning to use Ethereum blockchain and testnet Ropsten.

Activity 1: Establishing your identity and collecting your cryptocurrency (test ether) allowance
In this activity, you will create an account number to represent your decentralized identity. With this identity, you'll be able to collect mock Ethereum cryptocurrency allowance. You will generate a mnemonic from a web tool and use that mnemonic to extract the account address(es) using the MetaMask wallet.

1. Open your chrome browser
2. Link to the web site: https://iancoleman.io/bip39/
3. The screenshot of the web page is shown. You will make these three choices:
   - Generate 12-word mnemonic
   - Choose Eth (Ethereum) as the coin or cryptocurrency
   - Choose English as the language for the mnemonic and enter Return key

- You will see the mnemonic appearing in the BIP39 mnemonic box. Copy this and keep it safe and secure. (My mnemonic for this workshop is: "later dirt alert wear exotic hotel nasty thunder comfort powder alarm build")

Note:
1. When dealing with cryptocurrencies or crypto-assets such as ether, it is crucial always to be aware of and have your private keys, mnemonic phrases and passwords backed up.
2. You can use the mnemonic (12-word seed phrase) to reset your password at any time, so keep it safe and do not share it with anyone.

Dr. Bina Ramamurthy
345 Davis Hall, Buffalo, NY 14260-2600
Tel: (716) 645-3182   Fax: (716) 645-3464
E-mail: bina@buffalo.edu

3. Since every transaction requires you to spend some ether, make sure to collect **test ether** regularly from the following link:
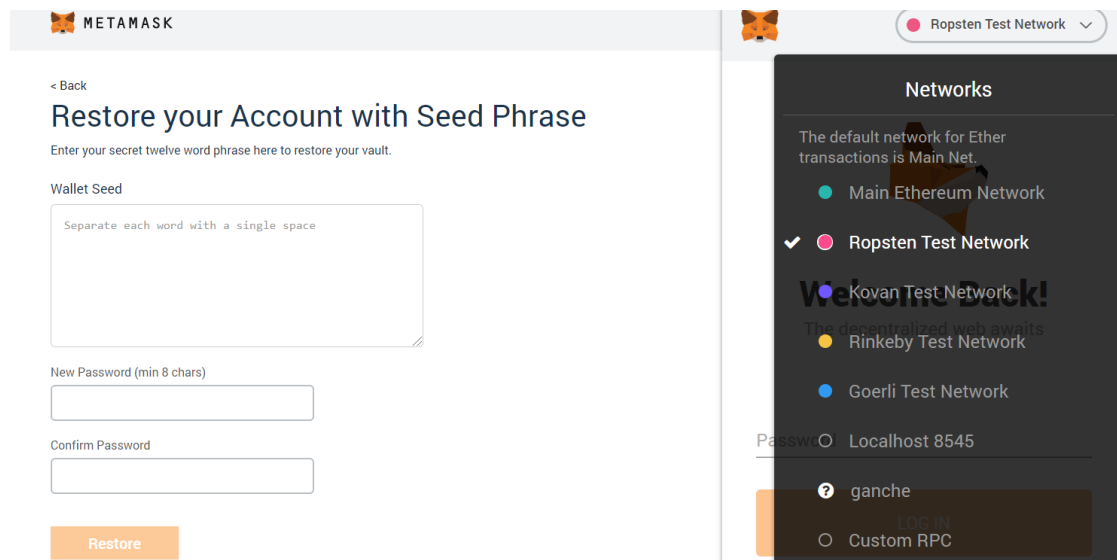https://faucet.ropsten.be/
Just enter your Metamask account number (as specified in Step-4) and click on the **Send me Test Ether** button.
You are limited to requesting **one ether per day**, so don't get greedy. Otherwise, you might get greylisted!
You can get test ethers from other faucets: https://faucet.dimensions.network/
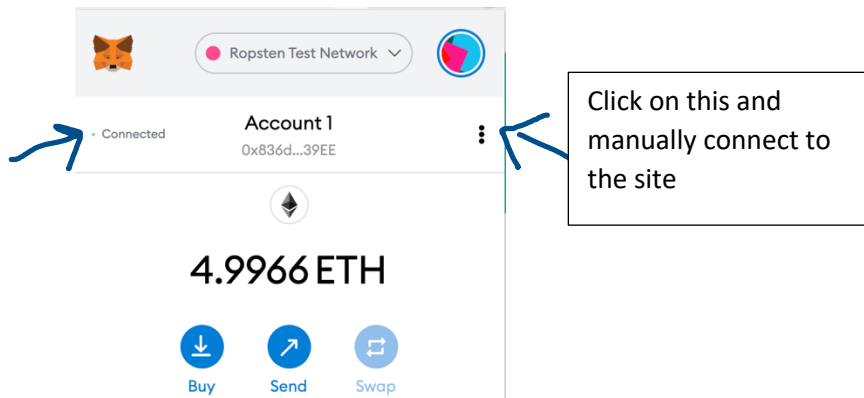(I do not what is prevalent and popular in Europe.)

4. Now click on the (left) MetaMask icon on your chrome browser.
   - Choose the Ropsten network. We will use the Ropsten test network for one of the demos.
   - Click on Import account using the seed phrase
   - In the screen that appears, enter the mnemonic you generated earlier.
   - Enter a password easy to remember and repeat it to confirm. And enter Restore.
   - You will see your account number on the MetaMask dropdown.
   - My account address and my identity is: 0xCbc16bad0bD4C75Ad261BC8593b99c365a0bc1A4
   - Here 0x indicates what follows is hexadecimal; followed by 20 bytes or 160-bit address; this is your decentralized identity; you can share it with any application that you want to interact with.

5. You can observe that the MetaMask wallet shows your account balance is 0. You need (test) ether to transact on the Ropsten Ethereum test network. Let us start collecting Ether from faucets meant for this purpose.
6. Copy your account address, as shown on Metamask. You will need this collect Ether balance for your account.
7. Now open this Ropsten faucet to receive 1 test Ether. Please make sure MetaMask is "connected" the faucet website. https://faucet.ropsten.be/

Dr. Bina Ramamurthy
345 Davis Hall, Buffalo, NY 14260-2600
Tel: (716) 645-3182   Fax: (716) 645-3464
E-mail: bina@buffalo.edu

Click on this and manually connect to the site

8. In the box that says enter your testnet account in the box that shows and then press the "send me test ether" button. If it succeeds, you should see a 1.0 Ether balance for your account. You can view this in the MetaMask wallet.You can collect 1.5 Ether every 24 hours. Keep collecting it.

9. You can also collect test Ethers from https://faucet.dimensions.network/. This is a faster faucet.

Activity 2: Design and Development of end-to-end decentralized applications: Download the counter-app.zip and unzip it.

Brief Overview of the application:

Counter Dapp: Counting things around the world: birds, people, whatever! Reporters on location!
This application displays the flag of a random country to each user. It also has a counter value, which is the same for all the participating users (initialized by the organizer). Each user can view the current counter value using the *Get Counter Value* button. The counter value can be incremented or decremented by a certain value by providing a suitable number in the respective input box and clicking on the Increment or Decrement button. All operations except 'Get Counter Value' are considered as transactions and cost ethers. Think of what can you use this counter for?

Commands for interacting with the applications.

Move the application counter-app. Open a terminal and issue these commands.

>npm install

>npm start

Connect to Ropsten on MetaMask and interact as guided by your instructor.

What do you see? Let's interact with the decentralized application.

Dr. Bina Ramamurthy
345 Davis Hall, Buffalo, NY 14260-2600
Tel: (716) 645-3182   Fax: (716) 645-3464
E-mail: bina@buffalo.edu