Handbook Assignment 2

Step 1

1.1 Setting up Remix and Creating `MyContract.sol`

Open the Remix IDE by visiting the following URL in your browser:
`https://remix.ethereum.org`

Create `MyContract.sol` and copy-paste the given code into the Remix editor. Compile it.
Attach a screenshot of the `MyContract.sol` code along with the Solidity compiler panel showing a green tick mark.

Deploying the Contract

To deploy the contract:

- Click on the **Run** menu option.
- Click on the **Deploy** button to deploy the contract on the built-in Blockchain.
- You will see the deployed contract.

Attach a screenshot after clicking the deploy button in the Remix editor, showing the available buttons such as `send`, `getAmount`, and `getBalance`.

1.2 Downloading and Installing Ganache

- **Downloading Ganache:** Download Ganache from: `https://archive.trufflesuite.com/ganache/`
- **Installing Ganache:** Locate the `Ganache-2.7.1.APPX` file in your Downloads folder and double-click to install it. Enable analytics if prompted, then press **Continue**.
- **Starting Ganache:** Find Ganache in your applications and start it.
- **Ganache Desktop:** Upon launch, the Ganache screen will appear.

  Attach a screenshot showing "Create a workspace" with "Quickstart Ethereum" and "New workspace Ethereum" buttons.
- Click **QUICKSTART** to start Ganache.

  Attach a screenshot of the Ganache console showing dummy addresses, ether balance, transaction count, and index.

Step 2

2.1 MyEtherWallet

Download MyEtherWallet from:
`https://github.com/kvhnuke/etherwallet/releases/tag/v3.21.06`
Unzip the file if necessary and open `index.html` from the extracted folder `etherwallet-3.21.06\dist`.

2.2 Creating Wallet

To create a wallet:

- Enter a password.
- Click **Create New Wallet**.
- Click on the **"Download Keystore File (UTC / JSON)"** button to save the generated keys.
- Now, click on the **"I understand. Continue"** button. Your private key will appear on the screen.

  Attach a screenshot showing "Save your keystore file" with buttons "Download Keystore File (UTC / JSON)" and "I understand. Continue".
- Click on the **"Print Paper Wallet"** button to keep a physical record of your wallet's private key. You will need this later for unlocking the wallet. Do not lose this output.
  To unlock your wallet, click on the **"Save Your Address"** button.

  (Attach screenshot where a screen in MyEtherWallet is visible: save your private key and the private key is also attached below to that "print paper wallet" button is there and "save your address" button is there.)

The wallet can be unlocked using the Private Key option. Cut-n-paste the private key from the previous steps (Attach screenshot where a screen in MyEtherWallet is visible having: "Unlock your wallet to see your address" , on the left side mentioned "how would you like to access your wallet? Metamask/Mist, ledger wallet, etc " click on private key button and on right side where mentioned "Paste your private key" paste the private key and attach the screenshot before pressing "unlock" button) . Then click the Unlock button.

2.3 Creating Node and Attaching Wallet to Ganache Blockchain

- You have to attach the wallet to the Ganache Blockchain that you have started in the earlier lesson. To do so, click on the **Network** dropdown box and go to the bottom of the list. You will see an option for **"Add Custom Network / Node"**. Select that item.
- Now, a screen will appear asking for the Ganache server address and the port to which it is listening. Type your Ganache server details(URL) – `http://127.0.0.1` and Port: **7545**. Give a **name** of your choice to this node.

Attach a screenshot of the "Set up your custom node" screen showing fields such as Node name, URL, and Port before clicking "Save & Use Custom Node".

- Click on the **"Save Use Custom Node"** button. You will see the connected message at the bottom of the screen. At this point, your wallet is successfully connected to the Ganache Blockchain.

2.4 DEPLOYING CONTRACT ON GANACHE USING MYETHERWALLET

To deploy the contract, select the **Contracts** menu option.

You will need to enter the contract's bytecode on this screen. When you compile your Solidity contract code, it generates a bytecode that runs on the Ethereum Virtual Machine (EVM). You will need to obtain this bytecode from **Remix IDE**.

1. Go to the Remix IDE screen where your contract code is written. If not, retype the contract in the code window.
2. Click on the **Bytecode** button. (Attach screenshot where in Remix editor the "bytecode" button is visible after compilation.)
3. The value of the `object` tag contains the required bytecode. Copy this carefully, ensuring that you do not include the enclosing quotes.
4. Paste this bytecode in the **Deploy Contract** screen. (Attach screenshot where MyEtherWallet is visible with fields: "Interact with contract or Deploy contract," where the "bytecode" field is filled with the bytecode obtained from Remix editor, and the "Gas limit" field is auto-filled.)

The Gas Limit field is automatically set. Below this field, you will find the selection for accessing the wallet.

1. Access the wallet using the Private Key of the Ganache account on which this contract will be deployed.
2. To get the private key, go back to the Ganache window and click on the keys icon of the first account.
3. A window will appear showing **Account information** with the account address and private key. (Attach screenshot from Ganache showing Account information of user account #1 with the account address and private key.)
4. Copy this private key and paste it in the **Paste Your Private Key** section of My EtherWallet.
5. Click on the key icon of Ganache and get the account address of other user and paste it on the same section of MyEtherWallet.

At this point, your wallet is attached to account #1 of the Ganache Blockchain.
Now, you are ready to sign and deploy the contract.

1. Click on the **Generate Transaction** button. (Attach screenshot where MyEtherWallet screen shows: "Interact with contract or Deploy contract" with a "Sign Transaction" button appearing and two fields "Raw transaction" and "Signed transaction.")

2. Signing the transaction generates and displays both Raw and Signed transactions.

3. Click on the **Send Transaction** button to deploy the contract on the Ganache Blockchain.

4. A confirmation pop-up will appear warning about transaction costs. Click on **Yes, I am sure! Make transaction**. (Attach screenshot showing the "Warning!" window.)

Examine the Ganache console to verify the deployment:

1. Check that the ETH balance in account #1 has been reduced. (Attach screenshot from Ganache console showing account #1's address, balance, Tx count, and index.)

2. Click on the **TRANSACTIONS** menu in Ganache.

3. You will see transaction details, including the sender address and created contract address. (Attach screenshot from Ganache console showing transaction details.)

2.5 Transaction

- **Copy the Created Contract Address** from the Ganache console.
- Create a new **MyEtherWallet** and click on the **"Interact with Contract"** tab.
- Paste the contract address that you previously copied in the **"Contract Address"** field. You also need to paste the **"ABI / JSON Interface"** of the contract on the above screen.
- To get the **ABI**, go to the Remix window and click on the **ABI button**. (Attach screenshot where in Remix editor the **"ABI"** button is showing after compilation.)
- After you paste this JSON in the **MyEtherWallet** interface, you will notice that the **ACCESS** button below the JSON interface is now activated. (Attach screenshot where a screen in **MyEtherWallet** is visible having: "**Interact with contract or Deploy contract**" where the contract address field would be filled and the JSON field filled with ABI code and take a screenshot before pressing the **"Access"** button.)
- Click **Access** button to access the contract.
- Upon clicking the **Access** button, the contract address and function selection dropdown will appear on the screen like in the **Remix editor**. (Attach screenshot where a screen in **MyEtherWallet** is visible having: "**Interact with contract or Deploy contract**" where the contract address field would be filled and the JSON field filled with ABI code and **"function selection dropdown will appear on the screen"**. The bold text part should be there in the screenshot.)

- Click on **"select a function"** and from the dropdown list, select **"send"**.
- To attach this new client to our **Ganache Blockchain**, go to **Ganache Console**. Click on the keys icon of account #2. (Attach screenshot in **Ganache window**: show Account information of user account #2 having account address and private key window and "done" button is there.)
- Copy the **Second Account Private Key** from the **Ganache console** and in the **MyEtherWallet** interface below the function selection dropdown, "How would you like to access your wallet?" on the left side, click the option as private key and then paste the **Second Account Private Key**. (Attach screenshot where a screen in **"Interact with contract or Deploy contract"** on scrolling down shows: "how would you like to access your wallet? Metamask/Mist, ledger wallet, etc." Click on **private key** button and paste on right side where mentioned **"Paste your private key"**. Attach the screenshot before pressing **"unlock"** button.) Then click **Unlock**.
- Invoke **send** method. When asked, input some value say **10 ETH** to be sent. Submit the transaction. Upon submission, the **"Warning!"** screen will appear. Click on **Generate Transaction**. (Attach screenshot for the **"Warning!"** screen: where it consists of field such as **"Amount to send"**, **"Gas limit"**, button of **"Generate transaction"**, and two fields **"Raw transaction"** and **"Signed transaction"** appear.)
- Click on **"Yes, I am sure! Make transaction."**
- Make the transaction and wait for some time for it to reflect in the Blockchain. Now, execute **"getAmount."** The amount shown should be **10** now. (Attach screenshot where a screen in **MyEtherWallet** is visible having: "**Interact with contract or Deploy contract**" where the contract address field would be filled and the JSON field filled with ABI code and **"function selection dropdown select the getAmount button where you enter the amount in the field"**. The bold text part should be there in the screenshot.)
- Execute **"getBalance."** The value field should now be **90**. (Attach screenshot where a screen in **MyEtherWallet** is visible having: "**Interact with contract or Deploy contract**" where the contract address field would be filled and the JSON field filled with ABI code and **"function selection dropdown select the getBalance button and the field value of getBalance showing"**. The bold text part should be there in the screenshot.)
- Examine the **transaction log** from **Ganache console** to see the various transactions performed by different users. (Attach screenshot from **Ganache window**: showing various transactions performed by different users.)