

Experiment No.1
To demonstrate the various online tools available to create block, block chain and Wallet
Date of Performance: 17/08/2023
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**Aim:** To demonstrate the various online tools available to understand block, block chain and Wallet

**Objective:** To make use of various online tools to understand the concept of blockchain

**Theory:**

A blockchain is “a distributed database that maintains a continuously growing list of ordered records, called blocks.” These blocks “are linked using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. A blockchain is a decentralized, distributed and public digital ledger that is used to record transactions across many computers so that the record cannot be altered retroactively without the alteration of all subsequent blocks and the consensus of the network.”

While blockchain is still largely confined to use in recording and storing transactions for cryptocurrencies such as Bitcoin, proponents of blockchain technology are developing and testing other uses for blockchain, including these:

- **Blockchain for payment processing and money transfers.** Transactions processed over a blockchain could be settled within a matter of seconds and reduce (or eliminate) banking transfer fees.
- **Blockchain for monitoring of supply chains.** Using blockchain, businesses could pinpoint inefficiencies within their supply chains quickly, as well as locate items in real time and see how products perform from a quality-control perspective as they travel from manufacturers to retailers.
- **Blockchain for digital IDs.** Microsoft is experimenting with blockchain technology to help people control their digital identities, while also giving users control over who accesses that data.
- **Blockchain for data sharing.** Blockchain could act as an intermediary to securely store and move enterprise data among industries.
- **Blockchain for copyright and royalties protection.** Blockchain could be used to create a decentralized database that ensures artists maintain their music rights and provides transparent and real-time royalty distributions to musicians. Blockchain could also do the same for open source developers.
- **Blockchain for Internet of Things network management.** Blockchain could become a regulator of IoT networks to “identify devices connected to a wireless network, monitor the activity of those devices, and determine how trustworthy those devices are” and to “automatically assess the trustworthiness of new devices being added to the network, such as cars and smartphones.”
- **Blockchain for healthcare.** Blockchain could also play an important role in healthcare: “Healthcare payers and providers are using blockchain to manage clinical trials data and electronic medical records while maintaining regulatory compliance.”

The blockchain is a chain of data blocks. Each block can be thought of as a page in a ledger. The individual blocks are composed of several components. Roughly these can be differentiated into the head of the block (block header) and his body (block body).

### **Block header**

The head of the block is divided into six components:

- the version number of the software
- the hash of the previous block
- the root hash of the Merkle tree
- the time in seconds since 1970–01–01 T00: 00 UTC
- the goal of the current difficulty
- the nonce

### **Wallet**

A blockchain wallet is a cryptocurrency wallet that allows users to manage different kinds of cryptocurrencies—for example, Bitcoin or Ethereum. A blockchain wallet helps someone exchange funds easily. Transactions are secure, as they are cryptographically signed. The wallet is accessible from web devices, including mobile ones, and the privacy and identity of the user are maintained. So a blockchain wallet provides all the features that are necessary for safe and secure transfers and exchanges of funds between different parties.

A blockchain wallet consists of:

1. Cryptocurrency (e.g., Bitcoin, Ether etc.)
2. Public key of the participants in the blockchain
3. Private key of the participant in the blockchain

Some of the example of wallets are MyEtherWallet, MetaMask, Bitcoin wallet etc.

### **Process:**

Step 1. Visit the website

<https://guggero.github.io/blockchain-demo/#!/tokens>

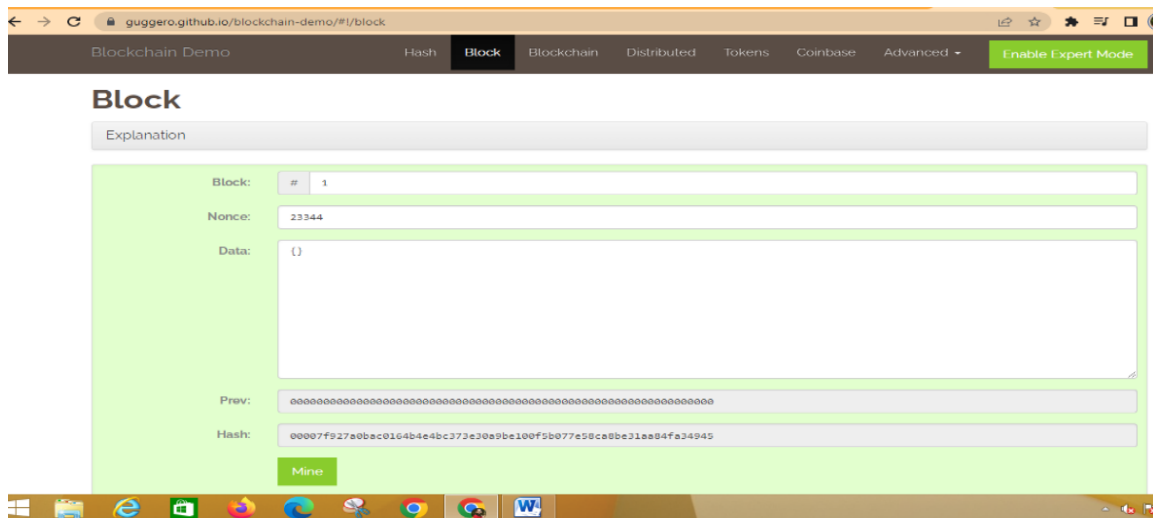


Fig.1.1 Block Demo

Step 2. Click on the block option tab to create a block with a particular information

Step 3. Click on the block chain option tab to create a block chain. For every block give certain input data and click on the mine tab to create a hash of the block

Step 4. Repeat step 3 for all the remaining blocks

Step 5. Click on the Distributed option tab to create distributed block chain

Step 6. Change the data field of a block on any Peer and then mine it to create a new block.

Step 7. Copy the nonce of the mined block and paste it into block (at the same level) in another peer. Also change the data field of this block as per data field. Do not click on the mine

Step 8. Repeat step 6-7 for every other blocks to form a distributed block chain.

To create a wallet in Blockchain.com

1.Go to Blockchain.com on your computer or smartphone and click on either Sign Up or Get Started.

2. You can also click on the Log In button then click on Sign up Now if you're returning to the site after a previous visit.

3. Each path will lead you right to the "Create Wallet" page. Once there, click on Create Wallet. Creating a wallet is the first step towards opening a Blockchain.com account.

Blockchain Demo

Hash Block **Blockchain** Distributed Tokens Coinbase Advanced ▾ Enable Expert Mode

## Blockchain

Explanation

Block: # 1  
Nonce: 23344  
Data: {}  
Prev: 00000000000000000000000000000000  
Hash: 00007f927a0bac0164b4e4bc3  
Mine

Block: # 2  
Nonce: 15208  
Data: {}  
Prev: 00007f927a0bac0164b4e4bc3  
Hash: 0000a88fd3769bfff66a501  
Mine

Block: # 3  
Nonce: 24677  
Data: {}  
Prev: 0000a88fd3769bfff66a501  
Hash: 00009d42ecc70a2b83c7ade1e  
Mine

Block: # 4  
Nonce: 48313  
Data: {}  
Prev: 00009d42ecc70a2b83c7ade1e  
Hash: 0000858ab9e426fdd0995fe9e  
Mine

Fig.1.2 Blockchain Demo

Blockchain Demo

Hash Block Blockchain Distributed **Tokens** Coinbase Advanced ▾ Enable Expert Mode

Nonce: 30002  
Tx: € 200 From: Ali -> Oli  
€ 10 From: Ali -> Robin  
Prev: 00000000000000000000000000000000  
Hash: 0000324db05df3d849ccf0236e2f1848e68a71f8b452103  
Mine

Nonce: 54232  
Tx: € 10 From: Oli -> Robin  
Prev: 0000324db05df3d849ccf0236e2f1848e68a71f8b452103  
Hash: 00003cc979796f6e6c0b570bde73fc3473b508a3c68bdec  
Mine

Nonce: 54657  
Tx: € 5 From: Robin  
Prev: 00003cc979796f6e6c0b570bde73fc3473b508a3c68bdec  
Hash: 0000d7293931c9834bd6c8b634149f  
Mine

Peer B

Block: # 1  
Nonce: 30002  
Tx: € 200 From: Ali -> Oli  
€ 10 From: Ali -> Robin

Block: # 2  
Nonce: 54232  
Tx: € 10 From: Oli -> Robin  
Prev: 0000324db05df3d849ccf0236e2f1848e68a71f8b452103

Block: # 3  
Nonce: 54657  
Tx: € 5 From: Robin  
Prev: 00003cc979796f6e6c0b570bde73fc3473b508a3c68bdec

Fig.1.3 Distributed Blockchain Demo

4. Enter your email address in the space provided. Make sure that it's a working email address that you currently have access to. You'll need it to verify your email address.
5. Enter a strong password, and confirm the password. You can ask your browser to suggest a strong password and to save it for you. Select your country if it's not already selected automatically. Review the information in the consent section and check the box when you're done. Click Create Wallet.

## Creating Wallet using ‘MyEtherWallet.com’

Step 1. Go to website [MyEtherWallet | MEW](https://myetherwallet.com)

Step 2. Click on the option ‘Create A New Wallet’

Step 3. Create Wallet using Software or any suitable method

Step 4. If wallet is to be created using Software, select ‘Mnemonic Phrase’ option to create wallet

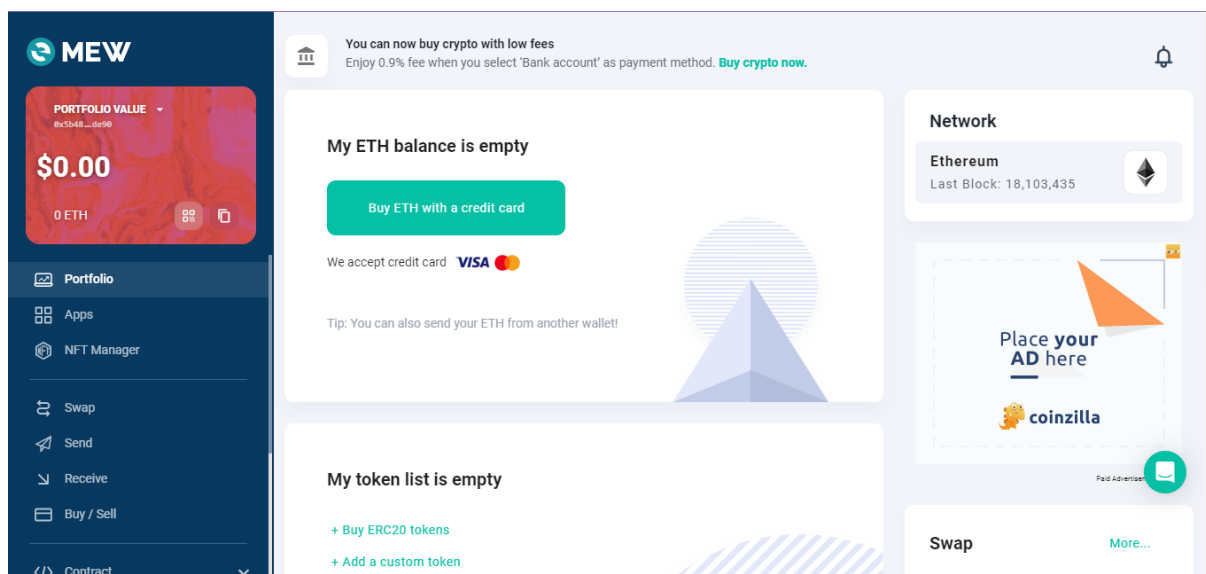
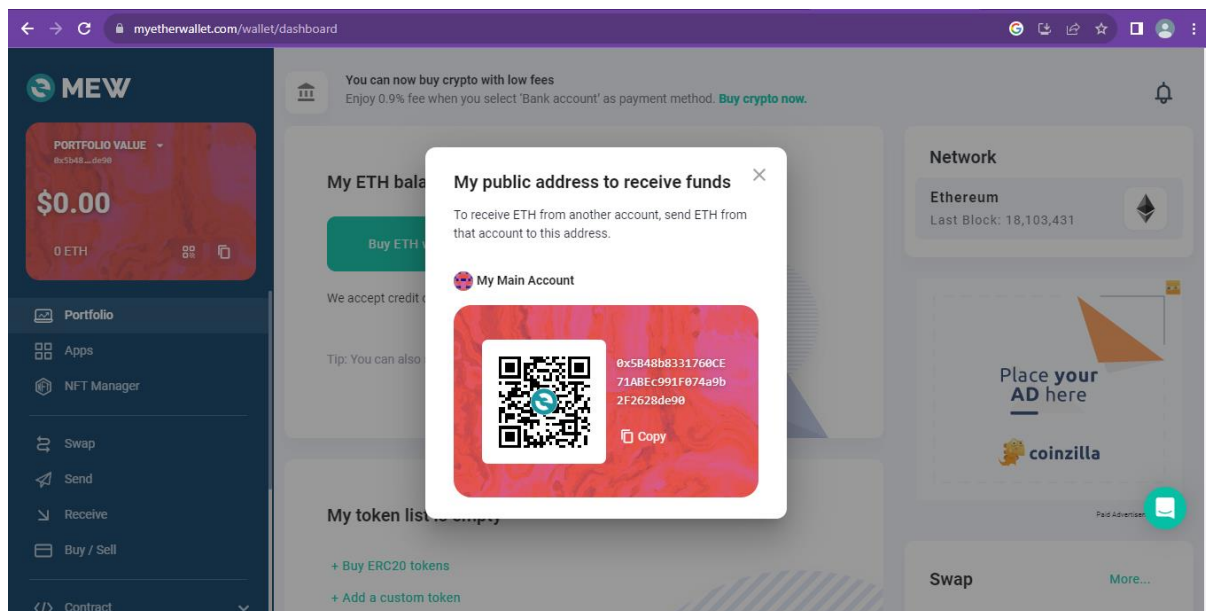
Step 5. Note down all the Mnemonic Phrase and then click on ‘I wrote Down’ Button

Step 6. Verify the Mnemonic Phrase as asked on the web page

Step 7. Once verification is successful, the wallet gets created.

Step 8. The Wallet can be accessed through MyEtherWallet.com

### Output:



## **Conclusion:**

- **Blockchain Explorer:** Essential for tracking real-time transactions and ensuring transparency on the blockchain.
- **Smart Contract Platforms:** Key for building decentralized applications (dApps) and automating trustless agreements.
- **Wallets:** Crucial for securely storing and managing cryptocurrencies, protecting private keys.
- **Consensus Mechanisms:** Fundamental in ensuring blockchain security and transaction validation.
- **Cryptocurrency Exchanges:** Vital for buying, selling, and converting digital assets, enhancing liquidity.
- **Token Standards:** Important for creating various blockchain tokens, supporting diverse use cases.
- **Interoperability Solutions:** Significant for connecting multiple blockchains and facilitating data and asset transfer.
- **Decentralized Finance (DeFi) Protocols:** Transform traditional finance, offering lending, borrowing, and trading without intermediaries.