

BT EXPERIMENT 1

=> Aim :-

Installation of Metamask & study spending Ether per transaction.

=> Outcome :-

Interpret the basic concepts in Blockchain Technology & its application.

=> SYSTEM REQUIREMENT :-

Operating System Recommended - 64 bit Open Source Linux or its derivatives.

Programming tools Recommended - C++, Java, Python, Solidity, etc

=> THEORY :-

- MetaMask :-

i) MetaMask is a cryptocurrency wallet that enables users to access the Web 3 ecosystem of decentralized applications (dapps).

ii) MetaMask is a cryptocurrency wallet that enables users to store Ether and other ERC-20 tokens.

iii) The wallet can also be used to interact with decentralized applications, or dapps.

iv) By connecting to MetaMask to Ethereum-based dapps, users can spend their coins in games, stake tokens in gambling applications, & trade them on decentralized exchanges (DEXs).

v> Advantages -

a> Popular

b> Simple

c> Saves Space

d> ~~Fog~~ Integrated

vii> Disadvantage -

a> Third Party

- Installation -

v> On the release page, pick a version you'll like to install.

vii> Download the zip file

viii> Unzip the file in a folder.

v> Open Chrome, & type "chrome://extensions" in the browser URL bar.

v> Click "Load Unpacked"

vii> On the window pop up, open the folder unzipped earlier.

viii> MetaMask should now be installed.

- Alternatives of MetaMask -

a> Coinbase Wallet

b> Brave Wallet

c> MyEtherWallet.

Conclusion:-

Hence, MetaMask was installed and spending Ether per transactions has been studied.

BT EXPERIMENT 2

⇒ Aims -

Create your own wallet using MetaMask for crypto transactions.

⇒ Outcome -

Interpret the basic concepts in Blockchain technology & its application.

⇒ SYSTEM REQUIREMENT -

Operating System Recommended - 64 bit Open Source & its derivatives

Programming Tools Recommended - C++, Java, Python, Solidity etc.

⇒ THEORY -

- MetaMask -

i) MetaMask is a cryptocurrency wallet that enables users to access the Web 3 ecosystem of decentralized applications (dapps).

ii) MetaMask is a cryptocurrency wallet that enables users to store Ether & other ERC-20 tokens.

iii) The wallet can also be used to interact with decentralized applications, or dapps.

iv) By connecting to Ethereum-based dapps, users can spend their coins in games, stake tokens in gambling applications, & trade them on decentralized exchanges (DEXs).

v> Advantages -

a> Popular

b> Simple

c> Saves Space

d> Integrated

v> Disadvantage -

a> Third Party.

- Creating MetaMask Wallet

v> ~~First~~ Download the MetaMask wallet and Install MetaMask for Chrome.

v> Click on the MetaMask Extension & Click get Started.

v> Click on Get Started on "Welcome to MetaMask" page.

v> After clicking, you will land on "New to MetaMask" page. Click on "Create a wallet" to create a new MetaMask Wallet.

v> On the "Help Us Improve MetaMask" page, click on "I agree".

v> Create Password.

v> Store your back-up phrases. This can be used to recover the wallet.

v> Confirm your Secret Recovery phrase

v> Start Using MetaMask

=> Conclusion F
Hence a wallet using MetaMask for Crypto transfer has been created.

EXPERIMENT
BT ~~ASSIGNMENT~~ 3

=>

Aim:-

Write a smart contract on a test network, for Bank account of a customer for following operations :-

- Deposite Money
- Withdraw Money
- Show Balance.

=>

Outcome :-

Interpret the basic concepts in Blockchain Technology & its applications.

=>

System Requirements :-

Operating System Recommended - 64 bit Open Source Linux or its derivatives.

Programming Tools Recommended - Solidity

=>

Theory :-

-

Smart Contracts -

Smart Contracts are digital contracts stored on a blockchain that are automatically executed when predetermined terms and conditions are met.

They typically are used to automate the execution of an agreement so that all participants can be immediately certain of the outcome, without any intermediary's involvement or time loss.

It works by following simple "if/when... then..." statements that are written in code on blockchain.

- iii) A network of computers execute the actions when predetermined conditions have been met & verified.
- iv) The blockchain is then updated when transaction is completed. That means the transaction cannot be changed, and only parties who have been granted ~~given~~ permission can see the results.
- v) Within the smart contract, there can be as many stipulations as needed to satisfy the participants that the task will be completed satisfactorily.

- Benefits -

a) Speed, Efficiency & accuracy

b) Trust & Transparency

c) Security

d) Savings

- Applications -

a) Increasing trust in retailer-supplier relationships

b) Making international trade faster & more efficient.

- Smart contracts deployed to blockchains render transactions traceable, transparent & irreversible.

Conclusion

Hence a smart contract for a Bank Account of a customer has been written and tested.

BT EXPERIMENT 4

=> Aim F

Write a survey report on types of Blockchains & its real time use cases.

=> Outcome :-

Interpret the basic concepts in Blockchain
Technology and its application.

=> System Requirement :-

Operating System Recommended - 64 bit Open Source Linux or its derivatives

Programming tools Recommended - C++, Java, Python, Solidity, etc

=> Theory F

- Types of Blockchains -

a) Public Blockchain -

- These blockchains are completely open to following the idea of decentralization. They don't have any restrictions, anyone can participate in the network.
- In the public blockchain, we can also perform verification of the transactions or records.

- Advantages - Trustable

Secure

Anonymous Nature

Decentralized.

- Disadvantages -
 - Processing
 - Energy Consumption
 - Acceptance
- Use Case - Public Blockchain is secured with proof of work or proof of stake that can be used to displace traditional financial systems. The more advanced side of this blockchain is the smart contract that enabled the blockchain to support decentralization. Example - Bitcoin, Ethereum.

b) Private Blockchain -

- These blockchains are not as ~~less~~ decentralized as the public blockchain only selected nodes can participate in the process, making it more secure than the others.
- In this few people are allowed to participate in a network within a company/organization.
- Advantages - Speed, Scalability, Privacy, Balanced
- Disadvantage - Security, Centralized, Control
- Use Case - With proper security & maintenance, this blockchain is a great asset to secure information without exposing it to the public eye. Therefore companies use them for internal auditing, voting & asset management. Example - Hyperledger, Corda.

c) Hybrid Blockchain :-

- It is the mixed content of the private & public blockchain, where some part is controlled by some organization & other makes are made visible as a public blockchain.
 - Even a primary entity owns a hybrid blockchain it cannot alter after the transaction.
- Advantages - Ecosystem
Cost
Architecture
Operations
- Disadvantages - Efficiency
Transparency
Ecosystem
- Use Case - It provides a greater solution to the health care industry, government, real estate & financial companies. It provides a remedy where data is to be accessed publicly but needs to be shielded privately.
Example - Ripple network & XRP Token.

d) Consortium Blockchain:-

- It is creative approach that solves the needs of the organization. This blockchain validates the transaction & also initiates or receives transactions.
- In this type, more than one organization manages the blockchain.

- Advantages - Speed
Authority
Privacy
Flexibility
- Disadvantages - Approval
Transparency
Vulnerability
- Use Case - It has high potential in businesses, banks, & other payment processors. Food packing of the organizations frequently collaborates with their sectors making it a federated solution ideal for their use.
Example - Tendermint & Multichain

⇒ Conclusion F

Hence a survey report on types of Blockchain & its real time use cases have been created.

BT EXPERIMENT 5

=> Aim F

Write a program to create a Business Network using Hyperledger.

=> Outcome F

Interpret the basic concepts in Blockchain Technology and its applications.

=> SYSTEM REQUIREMENTS

Operating System Recommended - 64 bit Open Source Linux or its derivatives.

Programming Tools Recommended - C++, Java, Python, Solidity

=> THEORY 5

- Hyperledger -

is Hyperledger is an umbrella project of open source blockchains & related tools, started in December 2015, to support the collaborative development of blockchain based distributed ledgers.

The objective of the project is to advance cross-industry collaboration by developing blockchains as distributed ledger, with a particular focus on improving the performance & reliability of these systems so that they are capable of supporting global business transactions by major technology, financial & supply chain companies.

- Frameworks :-

as Hyperledger Besu - Besu is enterprise-grade Ethereum Codebase.

↳ Hyperledger Fabric - Hyperledger Fabric is a permissioned blockchain infrastructure providing a modular architecture with a delineation of roles between the nodes in infrastructure, execution of Smart Contracts & configurable consensus & membership services.

↳ Hyperledger Sawtooth - Sawtooth includes a dynamic consensus feature enabling hot swapping consensus algorithms in a ~~is~~ running network.

- Tools :-

as Hyperledger Caliper - Hyperledger Caliper is a blockchain benchmark tools and ~~one of the~~ allows to measure performance with a set of predefined use cases.

↳ Hyperledger Cello - Hyperledger Cello is a blockchain module toolkit & aims to bring on demand development models to reduce efforts & cost.

↳ Hyperledger Composer - Hyperledger Composer was a set of collaboration tools for building blockchain networks that makes it simple & fast for owners & developers to create smart contracts & blockchain applications to solve business problems.

↳ Hyperledger Explorer - Designed to create a user-friendly Web application, Hyperledger Explorer can view, invoke, ~~and~~ deploy or query blocks, transactions & data,

as well as any other relevant data stored in the ledger.

⇒ Hyperledger Quilt - It offers interoperability between ledger systems by implementing the Interledger Protocol, which is primarily a payment protocol & is used to transfer value across distributed & non-distributed ledgers.

⇒ Conclusion

Hence - a program to create a Business Network using Hyperledger has been implemented.