GANACHE SERVER

BLOCKCHAIN VALIDATION

Time: 60 mins

Introduction

In this class, the student/s will learn to install the Ganache server and create wallet accounts.

Introduce and Recall Commands

- (Web3.HTTPProvider(ganacheUrl) Passes the network with rpc url for local testing
- myWallet.checkConnection() Stores the connection status

Vocabulary

- **Ganache server** is the web page with address and balance is a free local blockchain simulator. Even though the Ganache server is local, after testing the application locally, it can be deployed on online platforms.
- **MetaMask Wallet** is a cryptocurrency wallet that permits users to communicate with a blockchain as per functions, events and data in the Smart contract.

Learning Objectives

Student/s should be able to:

- ***Recall*** how to create a class and its instances to create accounts.
- ***Explain*** how to install the Ganache server to develop, test and deploy the blockchain transactions.
- ***Demonstrate*** creating accounts, display account addresses and balance.

Activities

1. **Class Narrative:** *(2 mins)*
    - Brief the student/s that the Artguard system works only on local systems and actual transactions cannot be performed between two users and hence a digital wallet can be built to do so.

2. **Concept Introduction Activity:** *(5 mins)*

- Let the student/s play the explore-activity to observe the wallet by creating an account and exploring the different tabs and 10 dummy addresses with 100 ETH balance.
- Explain how blockchain is implemented using Ganache by first logging into the wallet, injecting web3.js library to connect front-end and back-end, store data in blockchain, return and store hash value, execute Ethereum transactions.
- Using the slides, explain that the student/s will learn:
    - to setup the Ganache Server
    - to create the connection with the Ganache server and the flask
    - to display wallet balance

3. **Activity 1: Setup the Ganache Server** *(10 mins)*

    Teacher Activity: *(6 mins)*

- Explain the Ganache server and its functionality.
- Demonstrate how to install the Ganache server and create a workspace with 10 dummy accounts for testing.

    Student Activity: *(6 mins)*

- Guide the student/s to install the Ganache server and add 10 dummy account addresses with balance.

4. **Activity 2: Check Connection with Ganache and Flask** *(12 mins)*

    Teacher Activity: *(6 mins)* .

- Explain how the Ganache server can be connected to the user interface through web3 and further display the connection status.
- Demonstrate how to display the connection status of the Ganache server with the web page.

    Student Activity: *(6 mins)*

- Guide the student/s to check the connection status of the Ganache server and display it.

5. **Activity 3: Display Wallet Balance of an Address** *(12 mins)*

    Teacher Activity: *(6 mins)*

- Recall how a class can be created to create an account and instances of the class can be used to create multiple accounts with the balances.

- Demonstrate how to display account address and its balance on the wallet page.

  Student Activity: *(6 mins)*

- Guide the students to display the wallet page with account address and 0 balance.

6. **Test and Summarize the class learnings:** *(5 mins)*
   - Check for understanding through quizzes and summarize learning after respective missions.
   - Summarize the overall class learning towards the end of the class.

7. **Additional activities:**
   - Encourage the student/s to use the class Account() to create multiple accounts and display the list of accounts on the home page.
   - Encourage the student/s to add a condition to enable creation of maximum 3 accounts.

8. **State the Next Class Objective:** *(1 min)*
   - In the next class, student/s will add the functionality to transact – receive an amount in the wallet and send an amount from the wallet.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-13, 2-AP-14, 2-AP-19

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	Ganache Server	https://s3-whjr-curriculum-uploads.whjr.online/9965e3b8-f222-4e23-8393-b973cb272d8c.html
Explore Activity	Ganache Server	https://github.com/procodingclass/Blockchain-OP/blob/main/C10220.explore.gif
Teacher Activity 1	Setup the Ganache Server	https://github.com/Tynker-Blockchain/TNK-M13-C97-TAS_BP
Teacher Reference: Teacher Activity 1 Solution	Setup the Ganache Server	https://github.com/Tynker-Blockchain/TNK-M13-C97-TAS

Student Activity 1	Setup the Ganache Server	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS-BP
Teacher Reference: Student Activity 1 Solution	Setup the Ganache Server	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS
Teacher Activity 2	Check Connection with Ganache and Flask	https://github.com/Tynker-Blockchain/TNK-M13-C97-TAS_BP
Teacher Reference: Teacher Activity 2 Solution	Check Connection with Ganache and Flask	https://github.com/Tynker-Blockchain/TNK-M13-C97-TAS
Student Activity 2	Check Connection with Ganache and Flask	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS-BP
Teacher Reference: Student Activity 2 Solution	Check Connection with Ganache and Flask	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS
Teacher Activity 3	Display Wallet Balance of an Address	https://github.com/Tynker-Blockchain/TNK-M13-C97-TAS_BP
Teacher Reference: Teacher Activity 3 Solution	Display Wallet Balance of an Address	https://github.com/Tynker-Blockchain/TNK-M13-C97-TAS
Student Activity 3	Display Wallet Balance of an Address	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS-BP
Teacher Reference: Student Activity 3 Solution	Display Wallet Balance of an Address	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS
Student's Additional Activity 1	Display List of Accounts	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS-BP
Teacher Reference: Student's Additional Activity 1 Solution	Display List of Accounts	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS
Student's Additional Activity 2	Limit the Number of Accounts	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS-BP
Teacher Reference: Student's Additional Activity 2 Solution	Limit the Number of Accounts	https://github.com/Tynker-Blockchain/TNK-M13-C97-SAS

Post Class Project	Display Wallet and its Balance	https://github.com/Tynker-Blockchain/TNK-M13-C97-PCP-BP
Teacher Reference: Post Class Project Solution	Display Wallet and its Balance	https://github.com/Tynker-Blockchain/TNK-M13-C97-PCP