OOPS IN BLOCKCHAIN

Blockchain Development

Time: 60 mins

Introduction

In this class, the student/s will be able to use oops concept to create a block class using which different transaction blocks will be created.

New Commands Introduced

• time()	Time function returns the number of seconds passed since epoch.
• __init__()	Python __init__() constructor is an constructor in object oriented approach. This function is called everytime an object is created from a class.
• self	A default parameter, named 'self' is always passed in its argument. This self represents the object of the class itself.

Vocabulary

- **Transaction:** a transaction is record in the blockchain which contains the details of the transaction such as price, asset, and ownership, are recorded, verified and settled within seconds across all nodes.

Learning Objectives

Student/s should be able to:

- ***Recall*** how a new transaction block is created using class.
- ***Explain*** how a class block is created.
- ***Demonstrate*** how a new block with transaction details is created.

Activities

1. **Class Narrative:** *(2 mins)*
    - Brief the student/s that the class block is created to create transaction blocks by passing the block data to it .

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

    - Let the student/s play the explore-activity to observe .
    - Explain the need of hashing in blockchain and introduce Secure hashing for data.
    - Using the slides, explain that the student/s will learn:
        - to prepare the data for the block
        - to create class block
        - To display the data in HTML page

3. **Activity 1: Prepare the data for the block** *(14 mins)*

    Teacher Activity: *(7 mins)*

    - Explain how,the data is prepared for the block.
    - Explain the proces of preparing the block data for the block.
    - Demonstrate how to prepare the block data and print it.

    Student Activity: *(7 mins)*

    - Guide the student/s to prepare the data for the block..

4. **Activity 2: Create Class Block** *(12 mins)*

    Teacher Activity: *(6 mins)* .

    - Explain how to create the block class.
    - Explain how to create the calculateHash finction.
    - Demonstrate the process to pass the data to the block to create a new class box

    Student Activity: *(6 mins)*

    - Guide the student/s to perform securing hashing of the message or text and return its hash value.

5. **Activity 3: To display data in HTML page** *(12 mins)*

    Teacher Activity: *(6 mins)*

    - Explain the concept of accessing the block data in the HTMl page.
    - Demonstrate how to display the block data in the HTML file.

Student Activity: *(6 mins)*

- Guide the students to display the block data on the HTML *(2 min)*

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 create and display the block data.
    - Encourage the student/s to Auto generate the values..
8. **State the Next Class Objective:** *(1 min)*
    - In the next class, student/s will learn to use the blockchain technology to verify and trace the transactions.

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	Hashing in Blockchain	https://s3-whjr-curriculum-uploads.whjr.online/bfaf7b3b-dc0a-4434-99af-589bcbe4bcd1.html
Explore Activity	Attributes of Block Class	https://github.com/Tynker-Blockchain/TNK-M11-C83-SAS-BP
Teacher Activity 1	Prepare the data block	https://github.com/Tynker-Blockchain/TNK-M11-C86-TAS-BP
Teacher Reference: Teacher Activity 1 Solution	Prepare the data block	https://github.com/Tynker-Blockchain/TNK-M11-C86-TAS
Student Activity 1	Prepare the data block	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS-BP
Teacher Reference: Student Activity 1 Solution	Prepare the data block	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS

Teacher Activity 2	Create Block Class	https://github.com/Tynker-Blockchain/TNK-M11-C86-TAS-BP
Teacher Reference: Teacher Activity 2 Solution	Create Block Class	https://github.com/Tynker-Blockchain/TNK-M11-C86-TAS
Student Activity 2	Create Block Class	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS-BP
Teacher Reference: Student Activity 2 Solution	Create Block Class	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS
Teacher Activity 3	Display the data in HTML	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS-BP
Teacher Reference: Teacher Activity 3 Solution	Display the data in HTML	https://github.com/Tynker-Blockchain/TNK-M11-C86-TAS
Student Activity 3	Display the data in HTML	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS-BP
Teacher Reference: Student Activity 3 Solution	Display the data in HTML	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS
Student's Additional Activity 1	Display Data for Multiple Blocks	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS-BP
Teacher Reference: Student's Additional Activity 1 Solution	Display Data for Multiple Blocks	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS
Student's Additional Activity 2	Auto-generate the Values	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS-BP
Teacher Reference: Student's Additional Activity 2 Solution	Auto-generate the Values	https://github.com/Tynker-Blockchain/TNK-M11-C86-SAS
Post Class Project	Create and Display the Block Data	https://github.com/Tynker-Blockchain/TNK-M11-C86-PCP-BP
Teacher Reference: Post Class Project Solution	Create and Display the Block Data	https://github.com/Tynker-Blockchain/TNK-M11-C86-PCP