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School:		Campus:	
Academic Year:	Subject Name:	Subject Code:	
Semester:	Program:	Branch:	Specialization: ....
Date:			

Applied and Action Learning

(Learning by Doing and Discovery)

Name of the Experiement : ERC-20 Basics – Tokenization Concepts

Objective/Aim:

To study the concept of tokenization on the Ethereum blockchain and understand the implementation and working of ERC-20 tokens, including their basic functions and standards.

Apparatus/Software Used:

1.Remix IDE
2.MetaMask
3.Etherscan
4.OpenZeppelin Contracts
5.Brave Web Browser

Theory/Concept:

Tokenization refers to converting real-world or digital assets into blockchain-based tokens. These tokens can represent currencies, shares, loyalty points, or any digital value that can be transferred or traded securely.

The **ERC-20 (Ethereum Request for Comment-20)** standard defines a common set of rules that all fungible tokens on the Ethereum blockchain must follow. It ensures that tokens can interact seamlessly with wallets, smart contracts, and decentralized applications (DApps).

Key Features of ERC-20 Tokens:

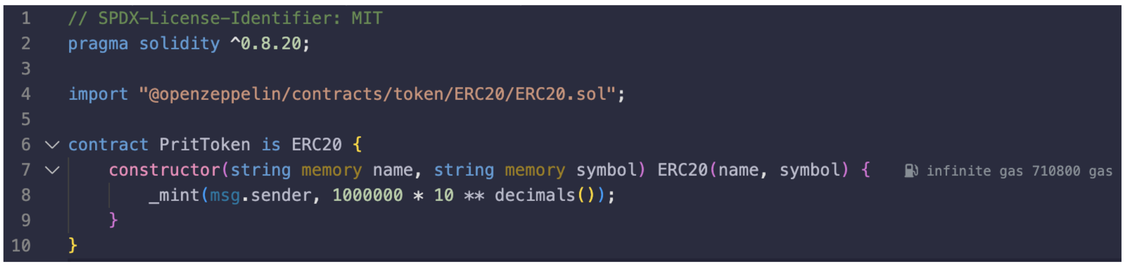
1. **Fungibility:** Every token is identical and interchangeable.
2. **Interoperability:** Standard functions make tokens compatible with multiple platforms.
3. **Transparency:** All transactions are visible on the blockchain.
4. **Smart Contract-Based:** Token logic is programmed in Solidity.

Common ERC-20 Functions:

- totalSupply() – Returns total number of tokens.
- balanceOf(address) – Shows balance of a specific address.
- transfer(address, uint256) – Sends tokens to another address.
- approve(address, uint256) – Allows another address to spend tokens.
- transferFrom(address, address, uint256) – Transfers tokens using allowance.
- allowance(address, address) – Shows approved spending limit.

Procedure:

1. Open **Remix IDE**.
2. Create a new **Solidity (.sol)** file.
3. Write the **ERC-20 token smart contract** code.
4. Compile the contract.
5. Choose **Injected Provider – MetaMask** as the deployment environment.
6. Deploy the contract through **MetaMask**.
7. Approve and confirm the transaction in MetaMask.
8. Copy the **deployed contract address**.
9. Check and explore your token on **Etherscan**.
10. Add the token to **MetaMask** using its contract address.
11. In Remix, open the contract under **Deployed Contracts**.
12. Use the **transfer function** to send tokens to another wallet.

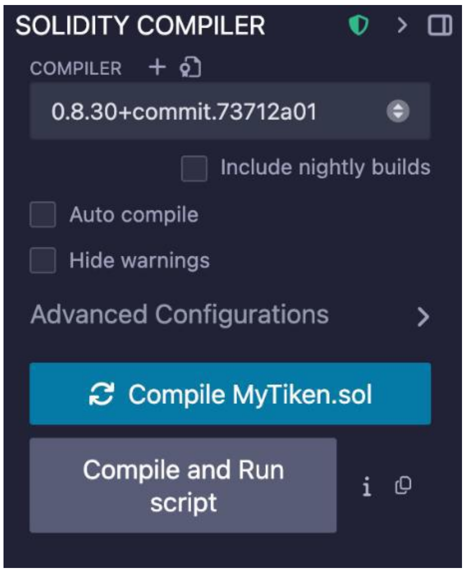


```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.20;

import "@openzeppelin/contracts/token/ERC20/ERC20.sol";

contract PritToken is ERC20 {
    constructor(string memory name, string memory symbol) ERC20(name, symbol) {     infinite gas 710800 gas
        _mint(msg.sender, 1000000 * 10 ** decimals());
    }
}
```

Step:1



SOLIDITY COMPILER

COMPILER

0.8.30+commit.73712a01

Include nightly builds

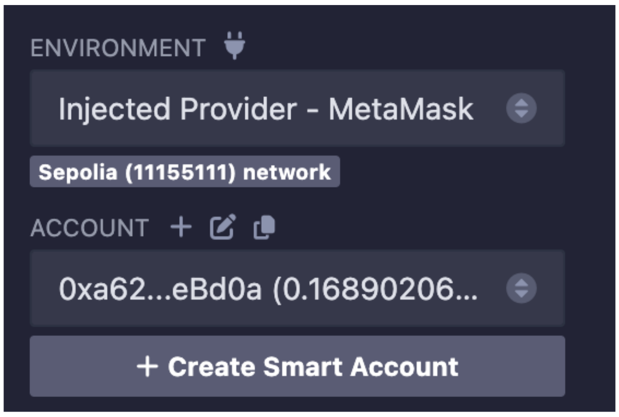
Auto compile

Hide warnings

Advanced Configurations

Compile MyTiken.sol

Compile and Run script



ENVIRONMENT

Injected Provider - MetaMask

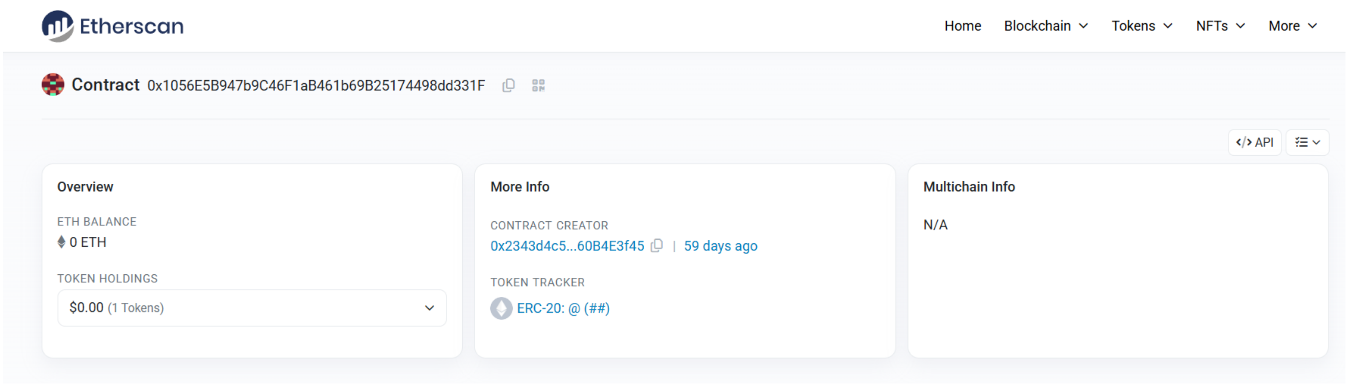
Sepolia (11155111) network

ACCOUNT

0xa62...eBd0a (0.16890206...

Create Smart Account

Step:2 **Step:3**



Contract 0x1056E5B947b9C46F1aB461b69B25174498dd331F

API

Overview

ETH BALANCE
0 ETH

TOKEN HOLDINGS
$0.00 (1 Tokens)

More Info

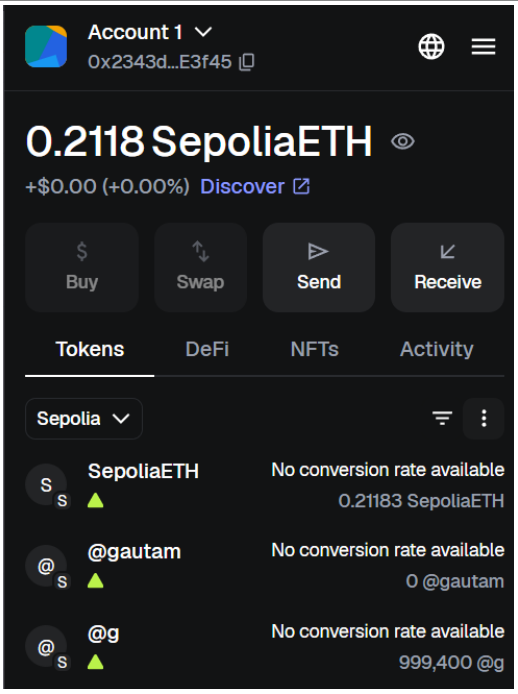
CONTRACT CREATOR
0x2343d4c5...60B4E3f45 | 59 days ago

TOKEN TRACKER
ERC-20: @ (##)

Multichain Info

N/A

Step:4


Account 1
0x2343d...E3f45
0.2118 SepoliaETH
+$0.00 (+0.00%) Discover

SepoliaETH — No conversion rate available — 0.21183 SepoliaETH
@gautam — No conversion rate available — 0 @gautam
@g — No conversion rate available — 999,400 @g

Step:5

Observation Table:

1. The ERC-20 token contract was successfully compiled and deployed using Remix and MetaMask.
2. The token appeared in MetaMask after importing the contract address, confirming successful minting.
3. Token transfer to another wallet was executed and verified on Etherscan, confirming proper contract functionality.

ASSESSMENT

Rubrics	Full Mark	Marks Obtained	Remarks
Concept	10		
Planning and Execution/ Practical Simulation/ Programming	10		
Result and Interpretation	10		
Record of Applied and Action Learning	10		
Viva	10		
Total	**50**		

Signature of the Student:

Name :

Regn.No.

Signature of the Faculty: