CENTURION UNIVERSITY
Shaping Lives... Empowering Communities!

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 Experiment: Build DeFi – AMM or Lending Prototype

*Coding Phase: Pseudo Code / Flow Chart / Algorithm

1. First we need to create two ERC-20 Tokens named as TokenA and TokenB
2. Then write smart contracts for TokenA and TokenB using Solidity.
3. Deploy both tokens to Sepolia test network using Remix IDE.
4. Save the deployed contract addresses for future reference and interaction.
5. Open MetaMask and add both TokenA and TokenB using their contract addresses to view and manage balances
6. Write AMM Contract in Solidity
7. Develop an Automated Market Maker (AMM) contract named as ‘swap.sol’ to handle liquidity pools and token swaps.
8. Then we need to include the following functions: addLiquidity() and swapTokens()
9. Compile the AMM Contract and deploy the AMM contract to the same network as our tokens.
10. Save the deployed AMM contract address for token approvals and interaction.
11. Approve TokenA for AMM Access via MetaMask
12. Use MetaMask to approve the AMM contract to spend a selected amount of TokenA on our behalf.
13. Similarly, approve the AMM contract to spend TokenB.
14. Call the addLiquidity() function from the AMM contract to deposit TokenA and TokenB into the pool.
15. Confirm successful liquidity addition by checking the contract’s reserve balances or return values.
16. Use the AMM’s swapTokens() function to exchange TokenA for TokenB or vice versa.
17. Confirm Swap and Balances.
18. Verify the transaction on the blockchain (e.g., Sepolia Etherscan) and check updated balances in MetaMask.

*Software used :

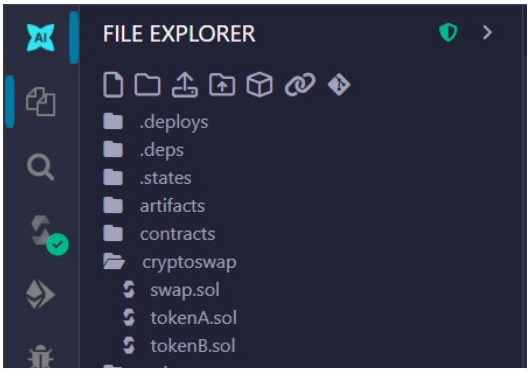
- Web browser (Brave or Microsoft edge)
- MetaMask wallet
- Ethereum Sepolia Test Network
- Remix IDE

* Testing Phase: Compilation of Code (error detection)

No Error

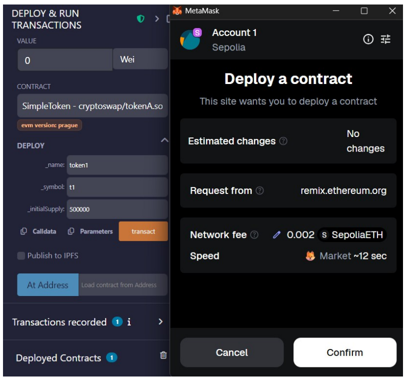
***** As applicable according to the experiment.*
Two sheets per experiment (10-20) to be used.

* Implementation Phase: Final Output (no error)



FILE EXPLORER

- .deploys
- .deps
- .states
- artifacts
- contracts
- cryptoswap
  - swap.sol
  - tokenA.sol
  - tokenB.sol



DEPLOY & RUN TRANSACTIONS

VALUE: 0 Wei

CONTRACT: SimpleToken - cryptoswap/tokenA.so

evm version: prague

DEPLOY

_name: token1

_symbol: t1

_initialSupply: 500000

Calldata | Parameters | transact

Publish to IPFS

At Address | Load contract from Address

Transactions recorded 1

Deployed Contracts 1

MetaMask

Account 1 · Sepolia

Deploy a contract

This site wants you to deploy a contract

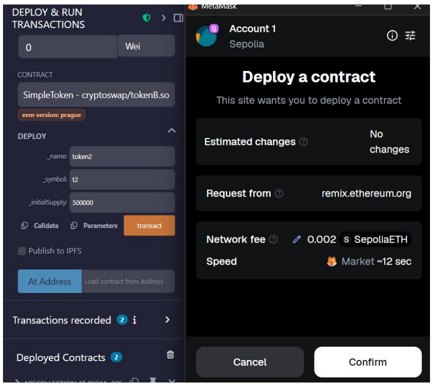
Estimated changes: No changes

Request from: remix.ethereum.org

Network fee: 0.002 SepoliaETH

Speed: Market ~12 sec

Cancel | Confirm



DEPLOY & RUN TRANSACTIONS

0 Wei

CONTRACT: SimpleToken - cryptoswap/tokenB.sol

evm version: prague

DEPLOY

_name: token2

_symbol: t2

_initialSupply: 500000

Calldata | Parameters | transact

Publish to IPFS

At Address | Load contract from Address

Transactions recorded 2

Deployed Contracts 2

MetaMask

Account 1 · Sepolia

Deploy a contract

This site wants you to deploy a contract

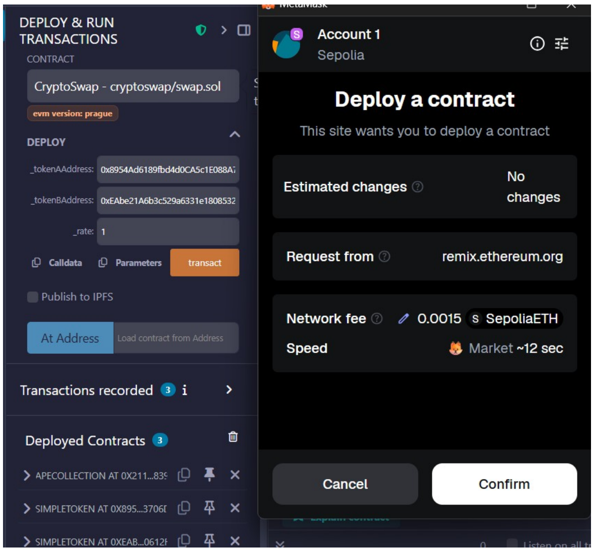
Estimated changes: No changes

Request from: remix.ethereum.org

Network fee: 0.002 SepoliaETH

Speed: Market ~12 sec

Cancel | Confirm



DEPLOY & RUN TRANSACTIONS

CONTRACT: CryptoSwap - cryptoswap/swap.sol

evm version: prague

DEPLOY

_tokenAAddress: 0x8954Ad6189fbd4d0CA5c1E088A

_tokenBAddress: 0xEAbe21A6b3c529a6331e1808532

_rate: 1

Calldata | Parameters | transact

Publish to IPFS

At Address | Load contract from Address

Transactions recorded 3

Deployed Contracts 3

APECOLLECTION AT 0X211...83

SIMPLETOKEN AT 0X895...3706

SIMPLETOKEN AT 0XEAB...0612

Account 1 · Sepolia

Deploy a contract

This site wants you to deploy a contract

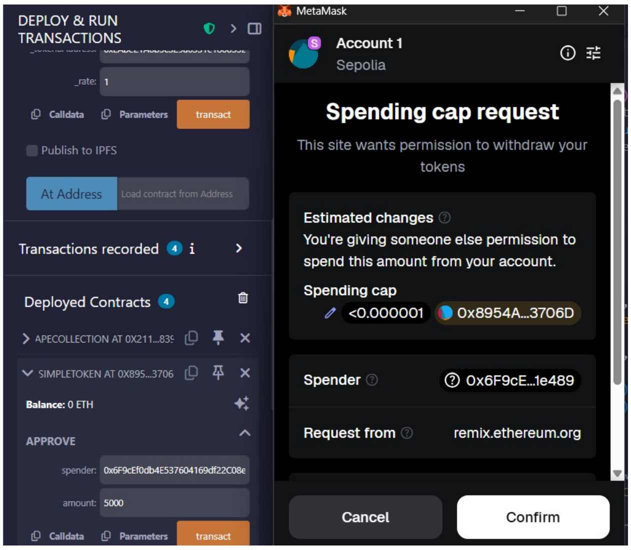
Estimated changes: No changes

Request from: remix.ethereum.org

Network fee: 0.0015 SepoliaETH

Speed: Market ~12 sec

Cancel | Confirm



DEPLOY & RUN TRANSACTIONS

_rate: 1

Calldata | Parameters | transact

Publish to IPFS

At Address | Load contract from Address

Transactions recorded 4

Deployed Contracts 4

APECOLLECTION AT 0X211...83

SIMPLETOKEN AT 0X895...3706

Balance: 0 ETH

APPROVE

spender: 0x6F9cEf0db4E537604169df22C08e

amount: 5000

Calldata | Parameters | transact

MetaMask

Account 1 · Sepolia

Spending cap request

This site wants permission to withdraw your tokens

Estimated changes

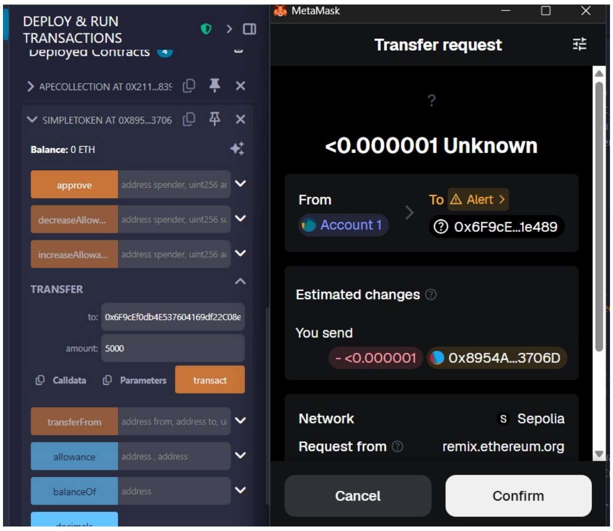
You're giving someone else permission to spend this amount from your account.

Spending cap: <0.000001 0x8954A...3706D

Spender: 0x6F9cE...1e489

Request from: remix.ethereum.org

Cancel | Confirm



DEPLOY & RUN TRANSACTIONS

Deployed Contracts 4

APECOLLECTION AT 0X211...83

SIMPLETOKEN AT 0X895...3706

Balance: 0 ETH

approve: address spender, uint256 a

decreaseAllow...: address spender, uint256 su

increaseAllowa...: address spender, uint256 a

TRANSFER

to: 0x6F9cEf0db4E537604169df22C08e

amount: 5000

Calldata | Parameters | transact

transferFrom: address from, address to, u

allowance: address , address

balanceOf: address

MetaMask

Transfer request

<0.000001 Unknown

From: Account 1

To ⚠ Alert: 0x6F9cE...1e489

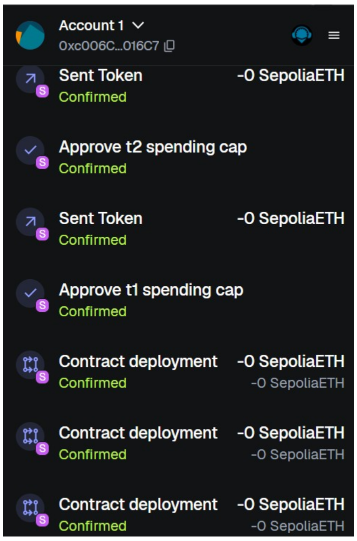
Estimated changes

You send: - <0.000001 0x8954A...3706D

Network: Sepolia

Request from: remix.ethereum.org

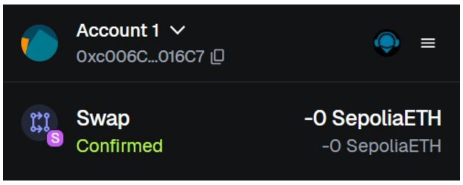
Cancel | Confirm



Account 1

0xc006C...016C7

Sent Token Confirmed	-0 SepoliaETH
Approve t2 spending cap Confirmed	
Sent Token Confirmed	-0 SepoliaETH
Approve t1 spending cap Confirmed	
Contract deployment Confirmed	-0 SepoliaETH -0 SepoliaETH
Contract deployment Confirmed	-0 SepoliaETH -0 SepoliaETH
Contract deployment Confirmed	-0 SepoliaETH -0 SepoliaETH



Account 1

0xc006C...016C7

Swap — Confirmed — -0 SepoliaETH / -0 SepoliaETH

*** As applicable according to the experiment.
Two sheets per experiment (10-20) to be used***

* Observation :

- The tokens (TokenA and TokenB) were created and appeared correctly in MetaMask.
- The AMM smart contract successfully accepted both tokens when adding liquidity.
- Swapping between the tokens worked, and balances were updated correctly.
- All actions were confirmed on the test network without any problems.

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 :

Signature of the Faculty :

Regn. No. :

**** As applicable according to the experiment.***
Two sheets per experiment (10-20) to be used