DEFI Crash Course: DEX Exercise 1 - Chocolate Factory

Intro

This exercise will get you working with the Uniswap V2 Factory and Router Smart Contracts.

You will deploy a new token, create a pair for it with ETH, and create helper functions to add / remove liquidity and swap tokens.

Eventually, you'll have to write some tests to make sure everything works.

Note: This exercise is executed on an Ethereum mainnet Fork block number `15969633`.Everything is already configured in the `hardhat.config.js` file

Ethereum MAINNET Addresses

- Uniswap V2 Router: 0x7a250d5630B4cF539739dF2C5dAcb4c659F2488D
- WETH Token: 0xc02aaa39b223fe8d0a0e5c4f27ead9083c756cc2

Accounts

- 0 - Deployer
- 1 - User

Tasks

Task 1 - Contract Creation

Complete all the open TODOs in `Chocolate.sol`.

- Upon token construction, create a pair for your token with WETH using the Uniswap V2 Factory.
- Complete the `addChocolateLiquidity` admin-only function, and add the liquidity using the Uniswap V2 router. The function will send the LP tokens to the smart contract owner.
- Complete the `removeChocolateLiquidity` admin-only function, and remove the liquidity using the Uniswap V2 router. The function will send the tokens to the smart contract owner.
- Complete the `swapChocolate` user's function, and swap the tokens using the Uniswap V2 router. The function will send the tokens to the user who swapped the tokens.

Task 2 - Tests

Complete all the open TODOs in `test/dex-1/tests.js`

Deployment

- Deploy the chocolate smart contract
- Get the newly deployed pair address, and print it using `console.log`
- Load and store the pair smart contract

Deployer Adds Liquidity

- Using your contract, add liquidity for Choclate & ETH
- Print the amount of LP tokens the deployer owns

User Swapping

- From the user account, swap 10 ETH to chocolates
- Make sure the swap succeded by comparing the before and after balances
- From the user account, swap 100 chocolates to ETH
- Make sure the swap succeded by comparing the before and after balances

Deployer Removes Liquidity

- Using your contract, remove 50% of the deployer's liquidity
- Make sure deployer owns 50% of the LP tokens (leftovers)
- Make sure deployer got chocolates and WETH back (greater amount than before)