

002-CSAMM

实验目的

- 掌握恒定和自动做市算法的原理和实现

实验环境

- VSCode
- Remix IDE: <https://remix.ethereum.org/> ;

实验原理

恒定和自动做市商算法.

$$x + y = k.$$

1. 交换. swap.

$$x + dx + y - dy = x + y = k$$

U

$$dx = dy$$

2. 添加流动性

T: 添加之前的 share 总量

a: 要添加的流动性

L: 添加之前的流动性

S: 新 mint 出的 share 数量

$$\frac{T+S}{T} = \frac{L+a}{L} \Rightarrow S = \frac{a \cdot T}{L} = \frac{(dx+dy) T}{x+y}$$

3. 移除流动性

T: 移除前的 share 总量

S: 本次要移除的 share 数量

L: 移除之前的流动性

移除后可获得的流动性

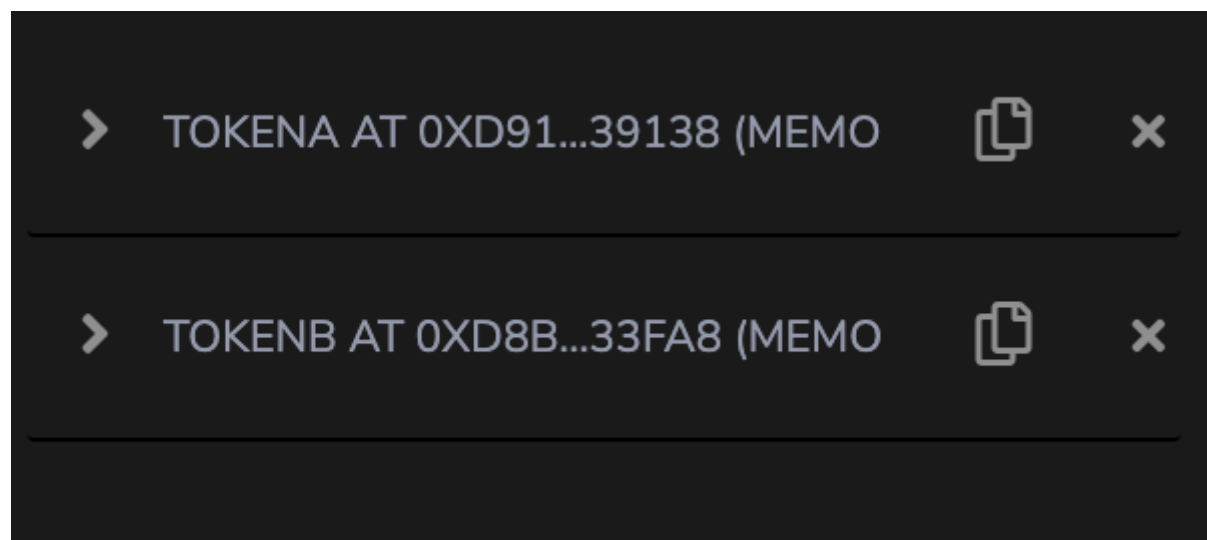
Handwritten mathematical derivation on a piece of paper:

$$\frac{a}{L} = \frac{S}{T} \Rightarrow a = \frac{LS}{T} \Rightarrow dx + dy = \frac{(x+y) \cdot S}{T}$$
$$= \frac{xS}{T} + \frac{yS}{T}$$

The derivation shows the relationship between variables a , L , S , T , x , and y . The final result is the differential equation $dx + dy = \frac{(x+y) \cdot S}{T}$, which is also expressed as the sum of two terms: $\frac{xS}{T} + \frac{yS}{T}$.

实验内容

1. 完善合约代码
2. 部署 token A 和 token B



3. 部署 CSAMM 合约



CONTRACT (Compiled by Remix)

CSAMM - CSAMM.sol

DEPLOY

_TOKEN0: 0xd9145CCE52D386f254917e4f

_TOKEN1: 0xd8b934580fcE35a11B58C6D7

 Calldata  Parameters **transact**

☐ Publish to IPFS

4. 添加流动性

addLiquidity

_amount0:

100

_amount1:

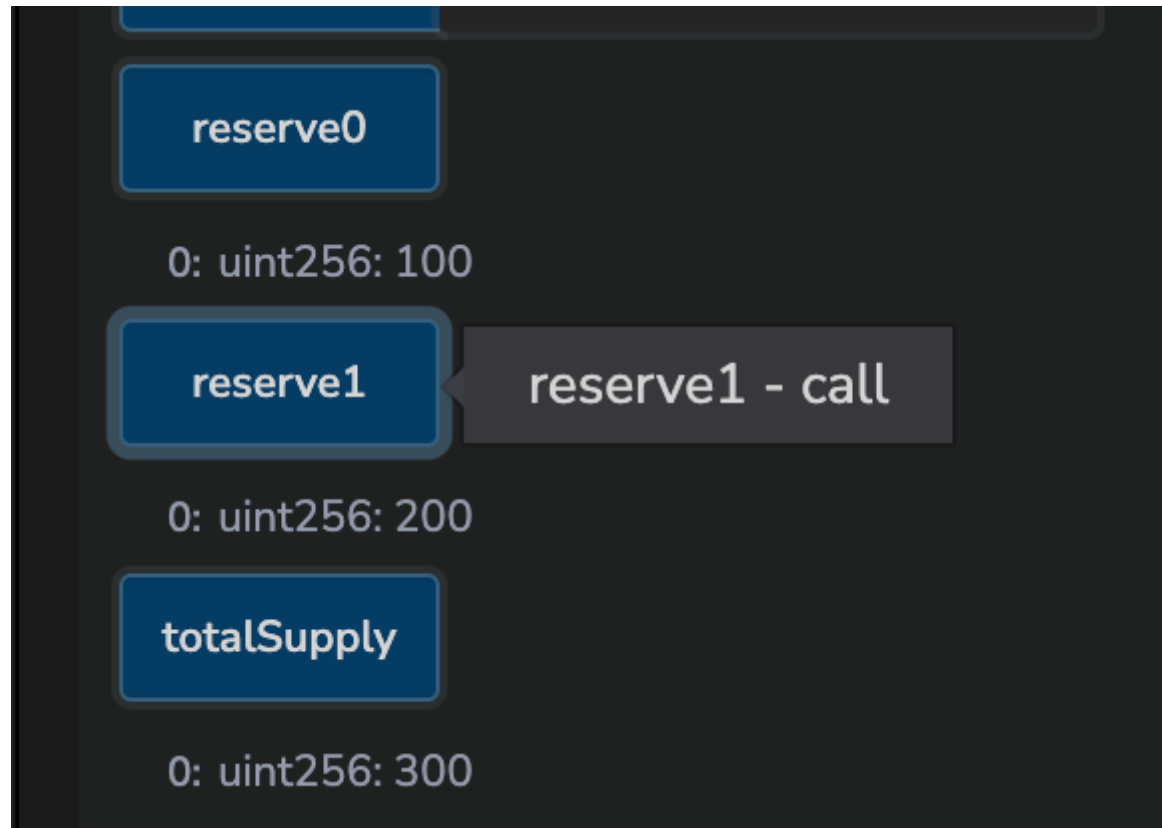
200

Calldata

Parameters

transact

5. 查看状态



6. 购买 25 个 token B

swap

_tokenIn: 0xd8b934580fcE35a11B58C6D7

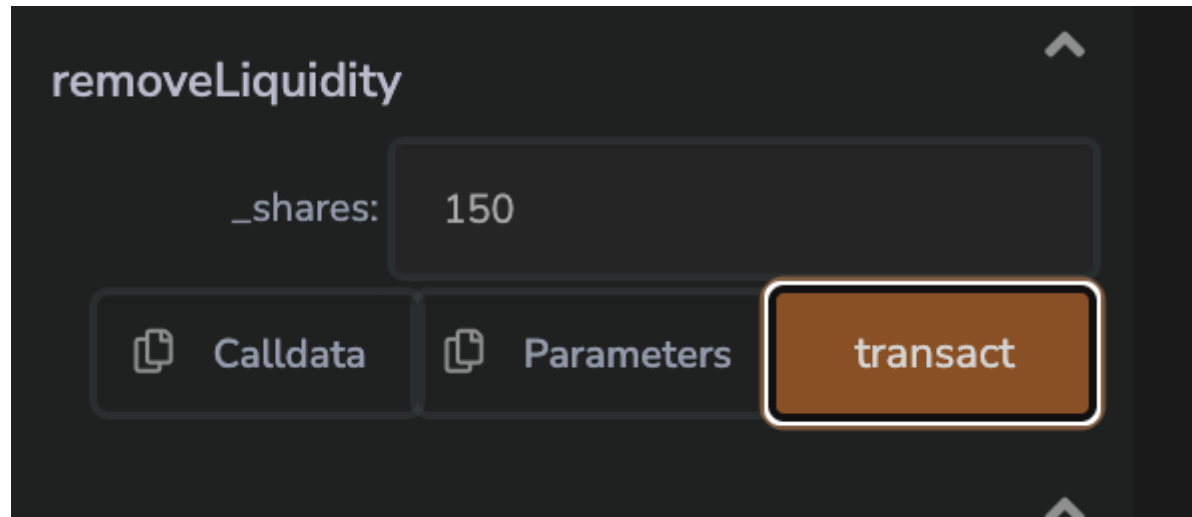
_amountIn: 25

Calldata Parameters transact

7. 查看合约状态



8. 移除流动性



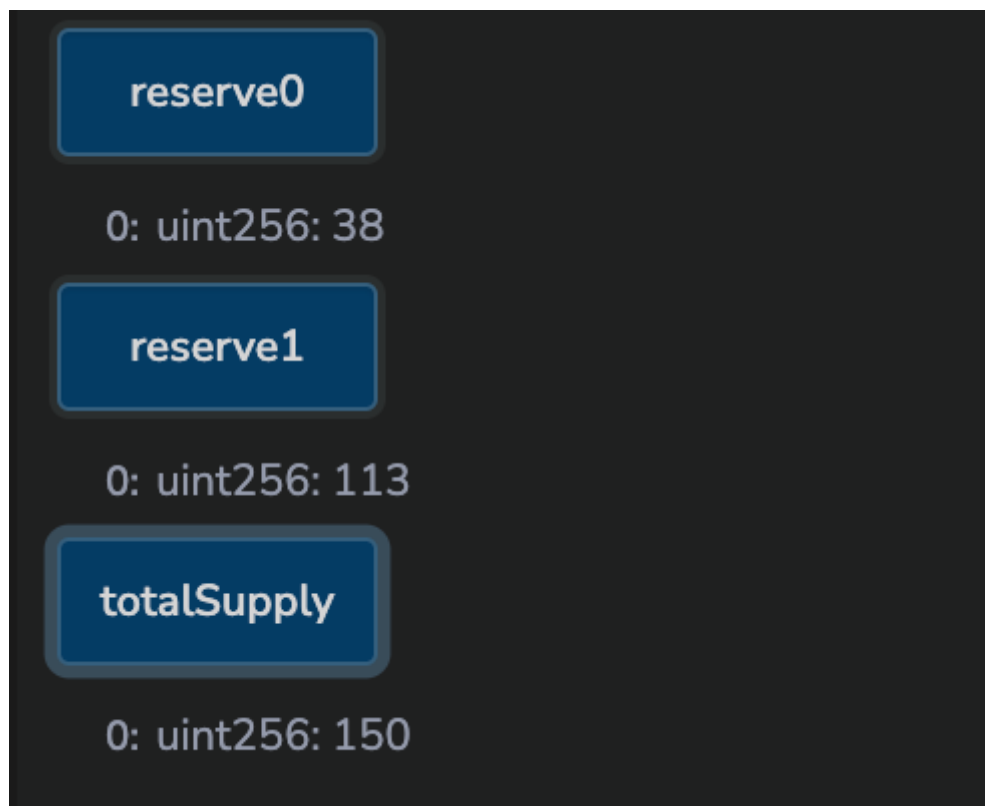
The screenshot shows a dark-themed interface for the `removeLiquidity` function. At the top, the function name `removeLiquidity` is displayed in white text. Below it, there is a label `_shares:` followed by a text input field containing the value `150`. At the bottom of the interface, there are three buttons: `Calldata`, `Parameters`, and `transact`. The `transact` button is highlighted with a white border and a brown background, indicating it is the primary action to be taken.

removeLiquidity

_shares: 150

Calldata Parameters transact

9. 查看合约状态



实验报告内容

实验代码，以及上述截图。

实验报告提交方式

实验报告完成后发送到邮箱 liangpl@cuit.edu.cn，标题为 **学号-班级-姓名-第X次实验报告**，实验报告提交截止时间为实验课一星期内。

